UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL

(UCI)

PROJECT MANAGEMENT PLAN: DEVELOPMENT OF A WARRANTY CLAIM, ANALYSIS SYSTEM PROJECT WITHIN WORKSHOP DEPARTMENT IN DISTRIBUIDORA COMERCIAL S.A.

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DEDICATION

The development of this project and the whole process required to fully finish this project management master degree could not be possible without the support of my beloved wife Konny who has been next to me, having patience, supporting me to achieve my projects and always making me look at the best side of things and thinking positive. To my mother Dilcia who taught me to be hard worker and honest when doing my job and thanks to her constant support I am the person that I am. To my father Victor Suazo who told me that if we are persistent well focused to overcome fears along the process. To my sister Ivy, my grandmother Consuelo and my dogs Yoko, Meeko, Milly, Winslow, for allowing me to sustain tenderness and faith toward my best performance as husband, brother and professional development.

Last, but not least, my greatest thankful to my angel Janis, where ever she is.

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ABSTRACT

The objective of this document is to develop a project management plan for the development of warranty management system project, in order to improve the internal processes within the Workshop Department in Distribuidora Comercial S.A. Currently there are no clear processes, policies or warranty management system that permits staffs to provide positive solutions, to customers who deal with equipment management obtained from the company.

This project consist in develop all the management plans required to generate the project management plan that is necessary to execute the project. This study is made of management plan for: scope, schedule, cost, quality, resources, communication, risk, procurement and stakeholder. To complete this management plans, a qualitative research method using interviews, document analysis, oral information as experiences of current staff, and the Project Management Body of Knowledge by the Project Management institute are used.

As a result of the project all the management plans and procedures needed to complete the project were developed following the ten knowledge areas explained within the Project Management Institute in the Project Management Body of Knowledge Sixth Edition (PMBOK). It is recommended to carry out the project in accordance with the project management plans detailed within this document which can enhance the chance of achieving project objectives. Furthermore, the company should consider to include proper Project Management Processes to develop future projects, including the templates developed during this project within their base of knowledge considering them as Organizational Process Assets.

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ABBREVIATIONS AND ACRONYMS

DICOSA	Distribuidora Comercial S.A.
DWCAS	Development of a Warranty Claim Analysis System
ERD	Entity Relations Diagrams
FGP	Final Graduation Project
FK	Foreign Key
PK	Primary Key
PM	Project Manager
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
PS	Project Sponsor
RAM	Responsibility Assignment Matrix
SDLC	System Development Life Cycle
UCI	Universidad para la Cooperación Internacional
WBS	Work Breakdown Structure

EXECUTIVE SUMMARY

Honduran companies that offer services and products must comply Consumer Protection Law, to defend, promote, spread and make sure their rights are regulated in relation to a variety of companies whose intensions are to provide goods and acceptable services. Such as, the Honduran Distribuidora Comercial S.A. was founded in 1971; and it is part of a group of companies of high prestige within Honduras that represent multinational companies, dedicated to medical equipment and supplies.

This company pursues keeping leadership in post service, they are looking forward to enhance warranty process because there is no current related information from past developmental projects offering neither a warranty policy nor a warranty management system. Due to the importance of this project, it is necessary to implement all given guidelines from the Project Management Institute in order to increase the chances of success. The intentions of this study is to propose a project management plan containing all the subsidiary documents that can be used as a framework by Distribuidora Comercial S.A to execute and control all the activities related to the implementation of Warranty Claim Analysis System, which will increase their customer satisfaction index and at the same time fulfill legal requirements.

The general objective was to create a project management plan for the Development of a Warranty Claim Analysis System project, to be used in the Workshop Process of Distribuidora Comercial S.A. The specific objectives were: To create the Integration Management plan that can be used to coordinate the various activities required from the start through the project completion, to produce the scope management plan to make sure that all work required to develop the Warranty Claim System is planned in order to conclude the project; to create the schedule management plan that contains the time constraints and that can be used as a baseline to ensure that project activities are completed within the time expected; to create the cost management plan that will be used as a baseline to complete the project within an expected budget; to define a quality management plan that establish the stakeholders' acceptance criteria related to the project deliverables; to create the resource management plan to ensure that all the necessary staff and assets are managed effectively within the schedule, budget and scope baselines planned; to establish a communication management plan that can be used to define communication strategies to share information within the project's stakeholders; to develop a risk management plan that identify and analyze each risk that can affect the project completion, developing plans to reduce probability and impact of negative risks.; to create the procurement management plan that defines the process of how the resources need it for the project development will be acquired; to create the stakeholders management plan, which identify and support strategies, required to guarantee the satisfaction of the project's stakeholders.

The methodology for this research was the qualitative research method, gathering information about experience of company's staff where interviews, document analysis and oral information exchanged were used to collect and gather information for the development of the project management plan the same as information within the Project Management Body of Knowledge 6th edition (PMBOK). This method helped understanding on how the processes were managed and adjust the solution proposed to the company's reality.

The results obtained through the development of this research project combined with the good practices established by the Project Management Institute within the PMBOK is the Project Management Plan, which consolidates all the information and describes how the project will be executed, monitored and controlled. This project management plan is composed of ten plans covering each one of the ten knowledge areas defined within the PMBOK. Processes and procedures are stablished within each plan, as it is required for the project development. With the use of these management plans to develop the Warranty Management System, the company would improve the way the project is developed and at the same time enhance the chances by conveying its objectives. It is recommended that the company considers the use of these plans, processes and templates, created within this research as an organizational assets and including them within their lessons learned database, creating a base of knowledge for projects development when following well-known practices established by a recognized institution. Furthermore, the company should also seek to standardize the way how they currently develop projects by introducing in their internal processes a formal team in charge of the project development who will be responsible for the initiation, planning, execution, monitor, control and closure of each future projects that the company could develop.

1. INTRODUCTION

1.1. Background

Honduran companies that offer services and products must comply with Consumer Protection Law, which has as a main objective to protect, defend, promote, divulge and make sure that consumer rights are respected through the regulation of consumer relations with companies that offer goods and services. Within this law, there is a special statement referring to warranty coverage that must be offered by all public or private companies that develop commercial activities where the seller extends to customers a sales document containing warranty coverage, among others. In addition, it emphasizes responsibility of warranty on manufactures, importers, distributors, wholesalers and retailers that have marketed the goods. This warranty coverage states that the seller compromise with the customer to execute a total repair, free charging, to those goods, that during the warranty period, show problems related to vices or factory faults problems. Nevertheless, this warranty period, must be the same given by the original manufacturer and cannot be less than sixty (60) days.

Distribuidora Comercial S.A. (DICOSA) is a Honduran company located in Tegucigalpa. The company responsible for sale, distribution and maintenance of medical equipment and supplies all over the country. DICOSA has been working within the medical business since 1971 and represents a variety of multinational companies within the country, selling their products and giving maintenance and technical solutions to hospitals, clinics, laboratories and other businesses within the

health system. The fulfillment of customer needs through excellent products and service given by highly motivated staff is one of the fundamental pillars of DICOSA's compromises with their customers.

Currently, the responsibility of warranty repairs lies on DICOSA's workshop department, where there is neither internal warranty policy, defined processes nor a warranty system that allows workshop's staff to evaluate the warranty coverage of the equipment sold by the company, and nor stored information related to warranty procedures. Warranty repairs are being done empirically and sometimes customer satisfaction is frustrated toward customer's expectations on technical issues under extended warranty, when the problem is not related to factory faults, but customer's mishandling of equipment, that in contrast, is not covered by the warranty. This misunderstanding can increase the odds of starting a legal problem since it is known and stated by the law that in case of doubt, the law will always be in customers favor.

1.2. Statement of the problem

DICOSA's workshop department has processes defined to achieve customer satisfaction related to preventive and corrective maintenance, the same as other services offered by them. As for the project management approach, there is no experience, processes or concrete knowledge, resulting the cause of failure past projects. Due to importance of the proper development of warranty management system project and the benefits expected, it is necessary to follow recognized practices as the ones identifies within the Project Management Body of Knowledge (PMBOK). As solution the Development of a Project Management Plan will contain

all tools, techniques and concepts that will be required to project's execution and that can be used to justify each decision taken.

1.3. Purpose

Projects are undertaken to generate solutions and not to become problems. Projects fail due to a variety of reasons, and lack of planning becomes relevant. As it is stated in the Project Management Body of Knowledge (PMBOK) "Good practice means there is a general agreement that the application of knowledge, skills, tools, and techniques to project management processes could enhance the chance of success over many projects in delivering expected business values and results" (Project Management Institute, 2017, p. 2) The creation of a Project Management Plan is a good practice and can be used as a guide where DICOSA's workshop can find documents that supports the proper decision making while executing the project, which at the same time will enhance the chances of achieving project objectives. This research proposal is contributing to create a Project Management Plan by using as a guiding the Project Management Body of Knowledge that provides all the components related to integration, scope, schedule, cost, quality, resource management, communication, risk, procurement, and stakeholder management plans.

1.4. General objective

To create a project management plan for the Development of a Warranty Claim Analysis System project to be used in the Workshop Process of Distribuidora Comercial S.A.

1.5. Specific objectives

1. To create an Integration Management plan that can be used to coordinate a variety of activities from the very first beginning to end.
2. To produce the scope management plan to make sure that all required work to develop Warranty Claim System is planned in order to conclude the project.
3. To create a schedule management plan containing constraining time that can be used as baseline to ensure completion within expected time.
4. To create cost management plan that will be used as a baseline to complete the project within an expected budget.
5. To define quality management plan to establish stakeholder’s acceptance criteria related to the project deliverables
6. To create the resource management plan to ensure that all the necessary staff and assets are managed effectively within the schedule, budget and scope baselines planned.
7. To create a communication management plan defining communicative strategies to exchange information with project's stakeholders.
8. To create a risk management plan that identifies and analyses each risk that can affect the project's completion, reducing the probability and impact of negative risks.
9. To create the procurement management plan that defines the processes of how needed resources, for the project development, will be obtained.
10. To create stakeholder’s management plan, identifying and supporting strategies, required to guarantee satisfaction of the project's stakeholders.

2. THEORETICAL FRAMEWORK

This chapter includes information to supports a qualitative research on: Development Of A Warranty Claim, Analysis System Project Within Workshop Department In Distribuidora Comercial S.A., including: concepts, definitions and references bibliographical sources that were used for the development of the Final Graduation Project. In addition, a complete outlook of the company's current situation is described, backing up reasons about why the project exists.

2.1 Company/Enterprise framework

2.1.1 Company/Enterprise background

There are just a few recognized companies within Honduras capable of offering high standard health services, Distribuidora Comercial S.A. (DICOSA) is one of them. Funded by SIMKA (Simon Kafie) Group in 1971, DICOSA was one of the first business companies dedicated to marketing products and medical material in the country. Currently, has two main distributor offices located in two main Honduran cities (Tegucigalpa and San Pedro Sula), the company has successfully completed several projects through private and public tenders, direct purchase, service contracts, among others.

As a result, of excellent service, DICOSA has an extensive list of customers who requires not only biomedical equipment, but also, highly specialized maintenance provides by the workshop department staff. DICOSA bets on best quality on its competitive service's strategies, so, all staff from the company is capable and specialized on defined areas to provide customer's attention and satisfaction.

2.1.2 Mission and vision statements

The project is aimed to improve the customer satisfaction indexes of DICOSA. While giving a better after sales service to current customers, who comply with the conditions within the warranty policy of the company. The workshop manager and related headboard are committed to continuously improve their process, and, as per the development of this project will help DICOSA to achieve customer's satisfaction and fulfill with law requirements within the customer's protection law, keeping their position as health industry leaders in the country.

The company mission and vision statements are as follow:

Mission

To provide complete solutions to the health industry through our products and experience, with highly motivated staff to give excellent service and a better quality of life. (Distribuidora Comercial S.A., 2021)

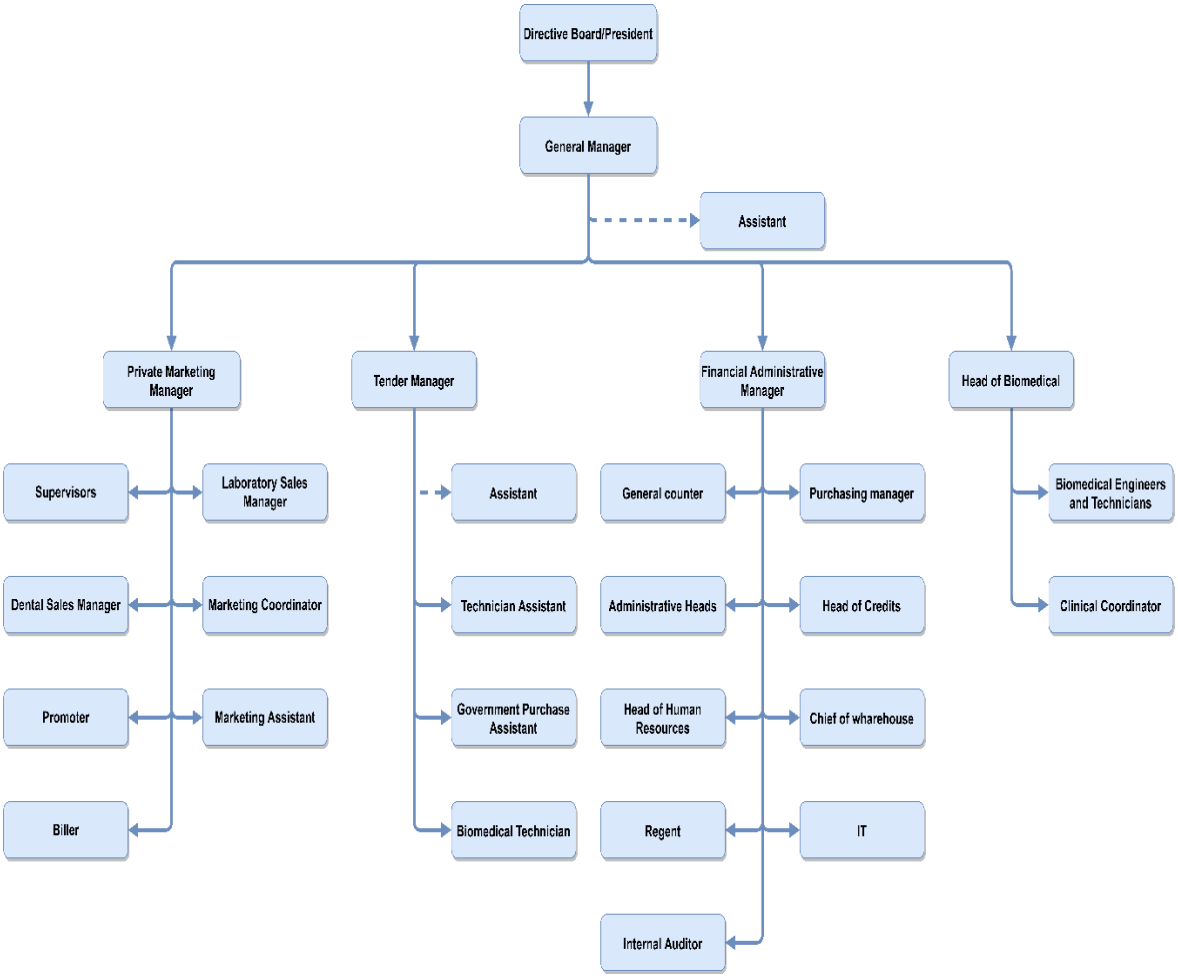
Vision

Maintain ourselves as leaders in the health industry, constantly innovating teamwork. (Distribuidora Comercial S.A., 2021)

2.1.3 Organizational structure

Figure 1

DICOSA's Organizational Structure



Note. Adapted from DICOSA, 2021

The organizational structure of DICOSA is a functional structure, divided in Marketing, Tender, Finance and Biomedical departments, which has a defined staff with clear responsibilities for each role. Figure 1 shows the organizational structure of DICOSA and provides varied roles, job position and dependencies. The company currently has 112 full time employees, whose are responsible of the different activities and processes within the company, they are divided as it is shown in Chart 1:

Chart 1

DICOSA's Department Division

Department	Employees
Sales	31
Logistic	29
Biomedical	10
Administrative	36

2.1.4 Products offered

DICOSA offer a variety of medical products, supplies and specialized equipment as it follows:

- Parenteral feeding
- Anesthesiology
- Blood bank
- Cardiology
- Monitoring Station
- Surgery
- Furniture and equipment for offices
- Home care
- Wound care
- Peritoneal dialysis
- Diagnosis
- Dermatology
- Endosurgery / Laparoscopy
- Laboratory equipment and supplies
- Sterilization
- Gynecology
- Surgical instruments
- Hemodialysis and peritoneal dialysis
- Larvicides and equipment for dengue, chagas, malaria
- Neonatology
- Pneumology
- Neurology
- Orthopedics
- Hospital waste processing
- Radiology
- Rehabilitation
- Respiratory and intravenous therapy
- Physical therapy
- Urology
- Printing papers
- Equipment program on loan

(Distribuidora Comercial S.A., 2021)

Within their services are: Sales Advisory, Telemarketing, home service, after sales service and technical services which includes preventive and corrective maintenance of medical equipment, training, equipment installation. (Distribuidora Comercial S.A., 2021)

2.2 Project Management concepts

2.2.1 Project

Defined by the Project Management Body of Knowledge (PMBOK) as a “temporary endeavor undertaken to create a unique product, service or result” (Project Management Institute, 2017, p. 4), considering as unique product, service or result due to complies a specific objective producing specific deliverable used to perform a service. Temporary endeavor means that a project has a defined time to be produced with a specific schedule that defines when the project begins and ends, as results exist beyond a period of time. The development of the Warranty System Analysis Project is unique product that will be used by the DICOSA to meet law requirements and satisfy their customer’s needs.

2.2.2 Project management

In order to meet the project requirements, project management is applied to it. According to PMBOK Guide, project management is “the application of knowledge, skills, tools, and techniques to project activities” (Project Management Institute, 2017, p. 10) once this is applied to a project, a sound foundation is placed for the organization, enhancing the chances to achieve their goals and objectives. Project Management enables the company to “tie project results, business goals, compete

more effectively in their markets, sustain the organization and respond to business environment changes” (Project Management Institute, 2017, p. 10).

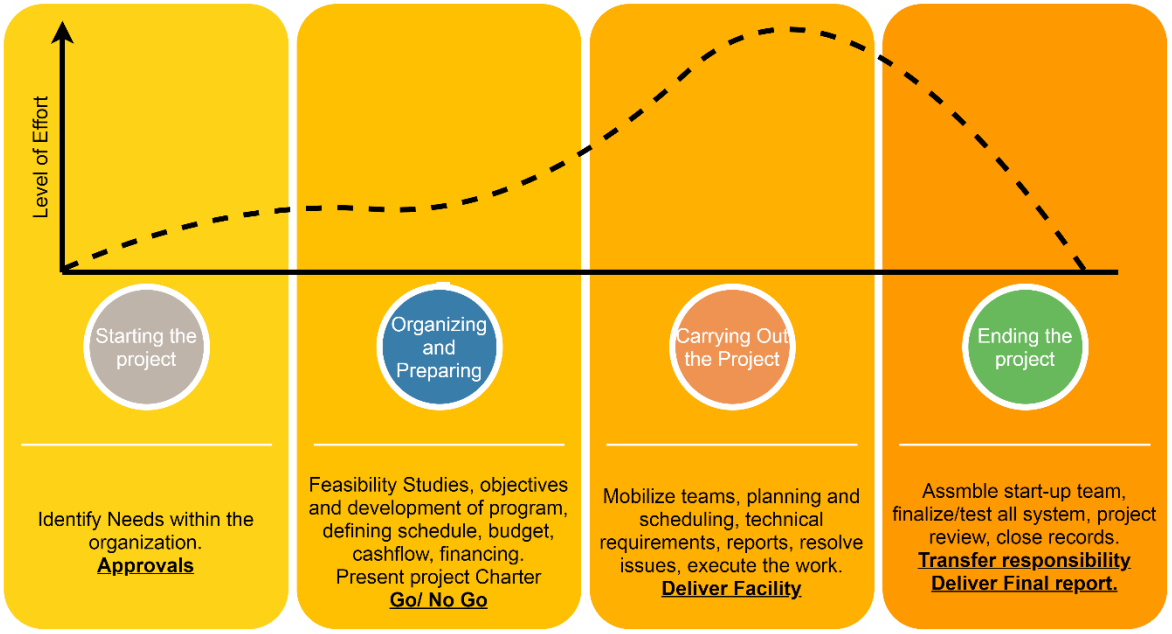
Project management is possible through “the appropriate application and integration of the project management processes identified for the project”. If project management knowledge is applied to project's development, it enables organization to execute it, in an effective and efficient way. “Project Management should be considered a strategic competency within the organizations" (Project Management Institute, 2017, p. 10).

2.2.3 Project life cycle

Project life cycle is defined by the PMBOK as the “series of phases that a project passes through from the start to its completion” (Project Management Institute, 2017, p. 19). It is the natural progression of a project, it does not matter the size, cost or time to be executed. All projects behave this way and go through each one of the phases identified by the PMBOK. These phases can be sequential, iterative or overlapping, depending on the project. Depending on the magnitude of the project the phases can be predictive or adaptive, in Figure 2, it is shown a generic representation of this phases and the necessary level effort required to carry out each:

Figure 2

Project Life Cycle and Level of Effort



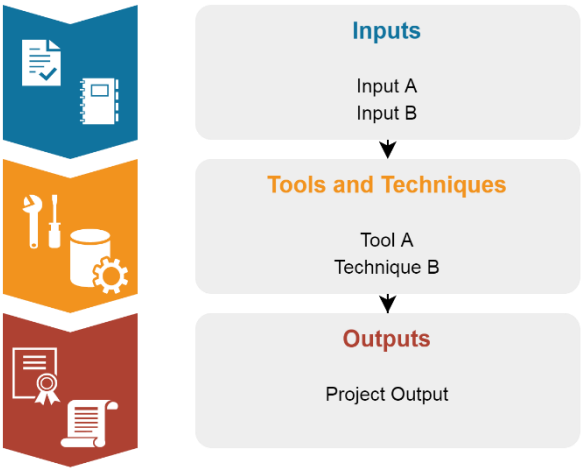
Note. Adapted from: MAX's, 2000 and Project Management Institute, 2017

2.2.4 Project management processes

The PMBOK Guide 6th Edition defines the project management processes as the execution of a series of project management activities. Each of these processes has as a result one or more outputs resulting from applying tools and techniques to one or more inputs. These outputs are the end result of a process which is logically linked, Figure 3 shows how inputs are transformed to outputs through the use tools and techniques.

Figure 3

Example Process



Note. Adapted from: Project Management Institute, 2017

Along the project development these processes are carried out once or in various points of the project life cycle, depending on these iterations can fall within three categories: Processes that are performed once, performed periodically as needed and continuously throughout the project. “Project management is accomplished through the application and logical integration of grouped project processes” (Project Management Institute, 2017, p. 22) in order to achieve specific objectives. There are different ways of grouping these processes but the PMBOK Guide 6th Edition has grouped into five Categories called Process Group. (Boyde, 2014)

The Process group are independent project phases and are as follow:

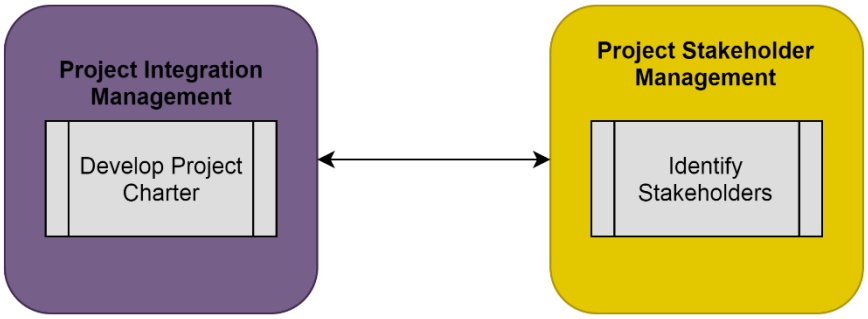
Initiating Process Group: in this phase the needs are identified, which can be problems or opportunities within the business, the PMBOK explains the reasons why a project can be initiated which lies within four categories (Project Management Institute, 2017, p. 7):

- Meet regulatory, legal, or social requirements
- Satisfy stakeholders requests or needs
- Implement or change business or technological strategies
- Create, improve or fix products, processes or services.

In this phase of the project it is necessary to state what the stakeholders want? , What is expected to be delivered? What cost and which will be the return? What is the problem's solution? Once the solution proposed is aligned to stakeholder's expectation, the project is authorized to start or follow to the next phase. The initiation process includes the development of the project charter and stakeholder register. **Figure 4** shows the initiating process group.

Figure 4

Initiating Process Group

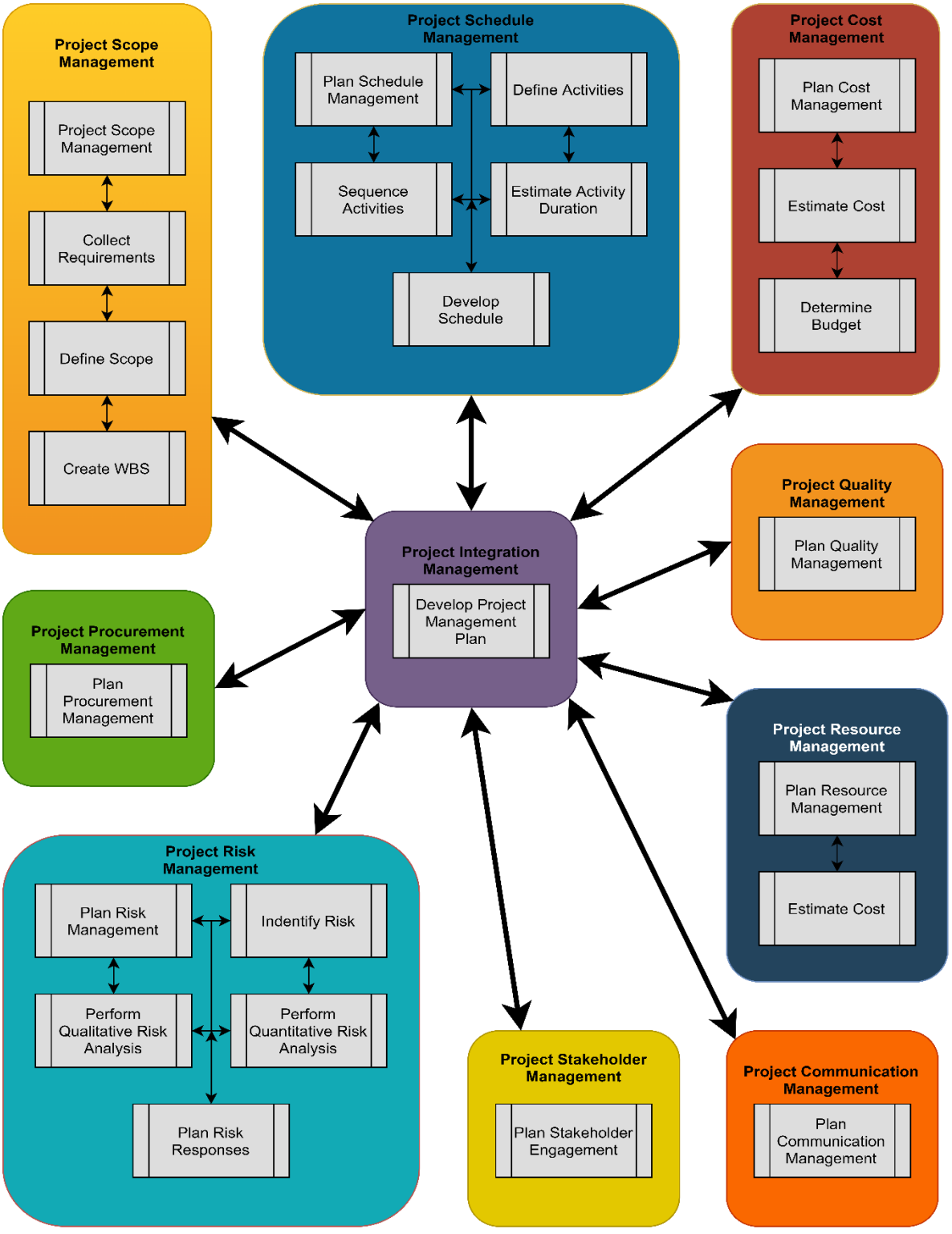


Note. Adapted from: Project Management Institute, 2017, p.562

Planning Process Group: Once the project has been approved, the planning process starts and consists in those processes required to establish the scope of the project efforts, define and refine the objectives, and develop the course of action required to attain those objectives." (Project Management Institute, 2017, p. 565) In the project planning process group the project manager defines what is necessary? How much and when the resources are needed? The strategy is revised in order to make sure if all variables and risk are clear. "The nature of a project may require the use of repeated feedback loops for additional analysis" (Project Management Institute, 2017, p. 565) this refinement is called progressive elaboration that indicates that iterations can occur in the planning phase. Once the plans are defined, the planning process group establishes the course of action through the approved version of the project management plan that is considered as a baseline. If all variables were taken in count while developing the project management plan, it increases the chances of success while achieving the project's objectives. **Figure 5** shows the elements within the planning process group.

Figure 5

Planning Process Group

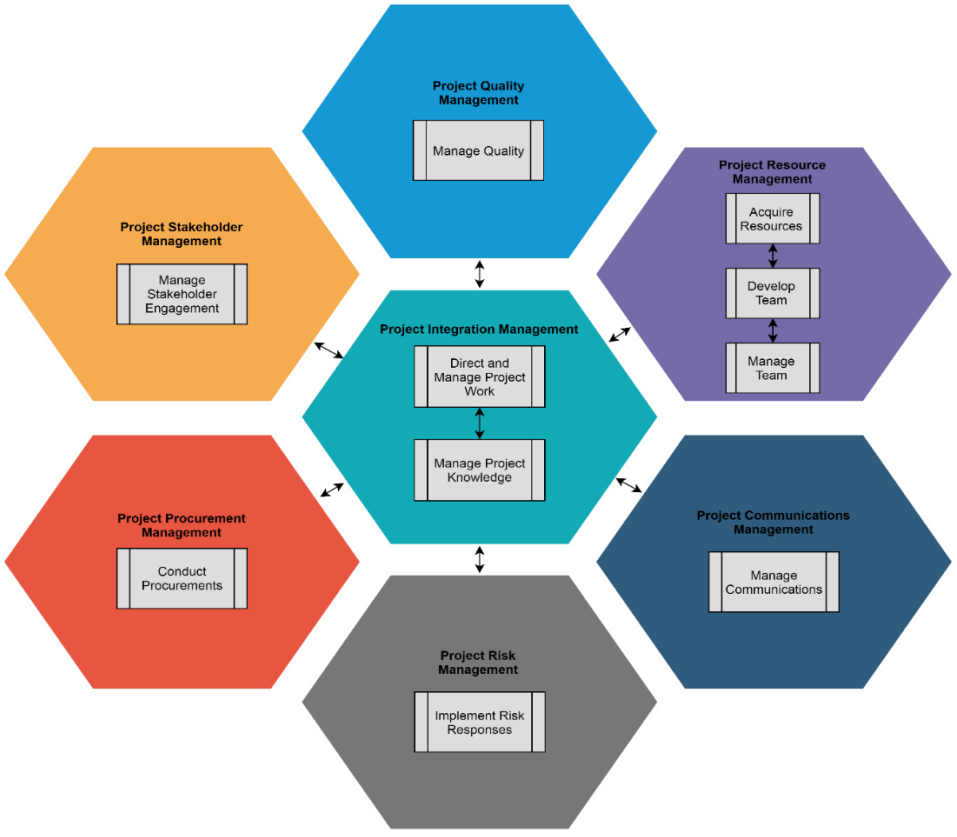


Note. Adapted from: Project Management Institute, 2017, p.566

Executing Process Group: In this process, established activities within the project management plan that were approved in the past process, are performed. During the executing process the project team coordinates resources, manages stakeholder's engagement and integrates all the activities based in the project management plan. The project management plan establishes how the activities should be done, which project members are in charge, responsible for each activity and establishes how to identify that the activity is complete. This process group is well known to require most of the resources, time and budget of the project, within this group all the execution processes has as an output plan, documents or organizational process assets updates. **Figure 6** shows the areas within this group:

Figure 6

Executing Process Group

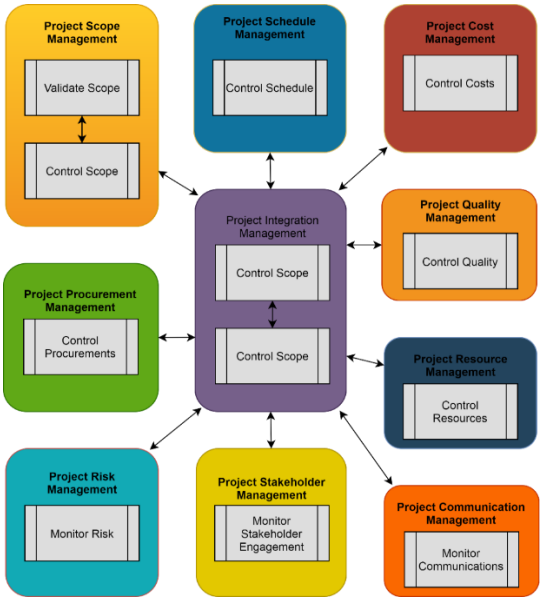


Note. Adapted from: Project Management Institute, 2017, p.596

Monitoring and Controlling Process Group: In this process group it is necessary to track the progress of the activities, evaluating the performance of the advances and results of each, as shown in **Figure 7**. The project management team is responsible to make sure that changes approved are applied. “Monitoring is collecting project performance data, producing performance measures, and reporting and disseminating performance information. Controlling is comparing actual performance with plan performance, analyzing variances, assessing trends to affect process, evaluate possible alternatives, and recommend appropriate corrective actions” (Project Management Institute, 2017, p. 613). It is recommended to continuously monitor the project team and other stakeholders, during this process is also involved the evaluation of change request, recommend corrections, monitor ongoing activities and influence factors in order that just approved changes are implemented.

Figure 7

Monitoring and Controlling Process Group

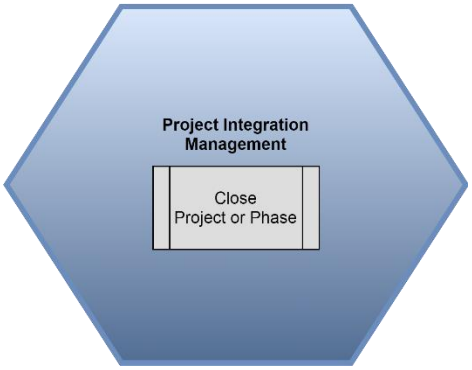


Note. Adapted from: Project Management Institute, 2017, p. 614

Closing Process Group: The last process group consists in formally closing all activities of the project, verifying that defined processes are completed. Depending on the results of the project the closing phase can be done early, if expected results and objectives were not achieved, e.g. abort or cancelled projects. “The key benefit of this process is that phases, projects and contracts are closed out appropriately” (Project Management Institute, 2017, p. 633). The closing process is showed in **Figure 8**:

Figure 8

Closing Process Group



Note. Adapted from: Project Management Institute, 2017, p.633

2.2.5 Project management knowledge areas

The project management practices has been divided by the Project Management Institute (PMI) in 10 knowledge areas which are defined within the PMBOK, each of these areas are needed in order to develop the project. Each of these knowledge areas coincide with the process groups. Within these 10 knowledge areas the PMBOK has defined practices, inputs, outputs, tools and techniques. It is necessary to emphasize that each of the knowledge areas must need to be tailored due to each project is unique, some of them are done throughout the project.

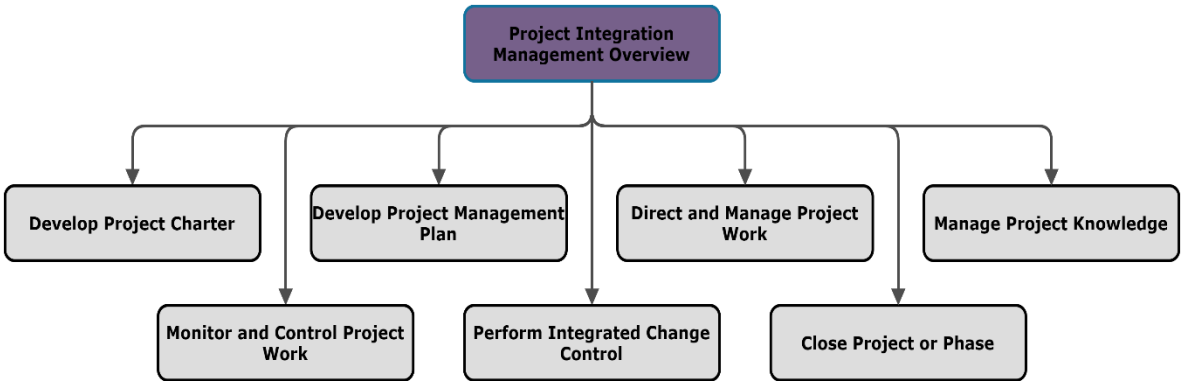
2.2.5.1 Project Integration Management

Project integration management is the knowledge area that includes the processes of unification of all the other knowledge areas. This knowledge area "include activities to identify, define, combine, unify, and coordinate the various processes and project management activities within the Project Management Process Groups" (Project Management Institute, 2017, p. 69). Project Integration knowledge is oriented specially addressed to project managers, who are responsible to combine the results of the other project's knowledge areas, having as a result an overall overview of the project. This responsibility cannot be transferred as other knowledge, which will be seen in the following sections, which can be assigned and managed by other specialists.

Figure 9 provides an overview of the project integration management knowledge processes.

Figure 9

Project Integration Management Overview



Note. Adapted from: Project Management Institute, 2017, p.71

2.2.5.2 Project Scope Management

This knowledge area is required to make sure the activities and work required to develop the project is included and only the work required. The PMBOK defines two key concepts for project management scope:

Product Scope: "The features and functions that characterize a product, service or result." (Project Management Institute, 2017, p. 131)

Project Scope: "The work performed to deliver a product, service or result with the specified features and functions." (Project Management Institute, 2017, p. 131)

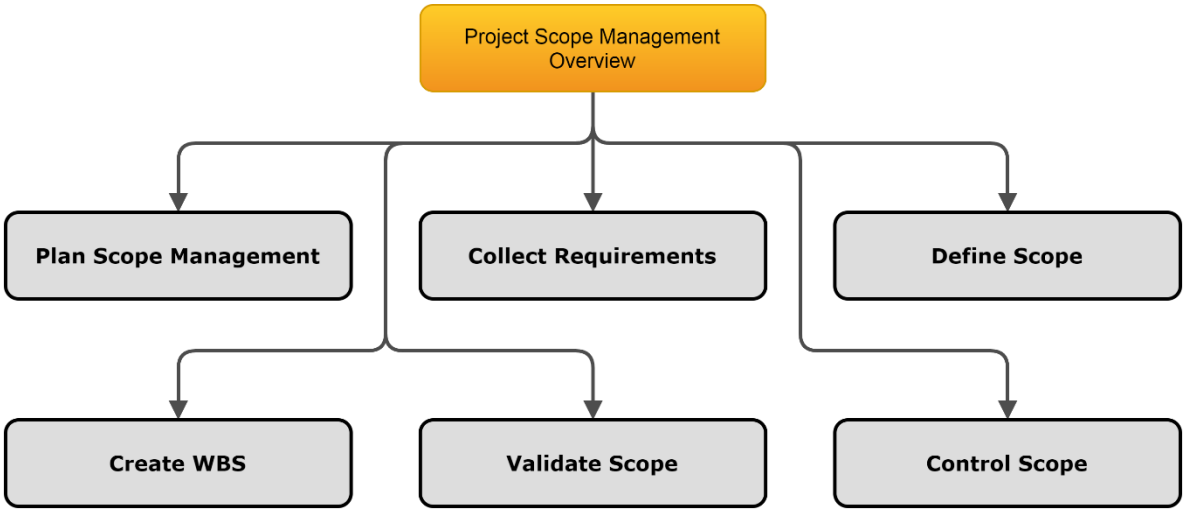
Sometimes, both terms from above, can be misunderstood, the product scope is defined within the requirement list, and on the other hand the project scope is wider than product scope and is located within the project management plan.

Within this knowledge area the problems and business needs are identified, the project team contributes with viable solutions for meeting those needs and the stakeholder's needs are collected.

Figure 10 shows an overview of the project scope management processes, it is good to know that in practice these processes can interact with others and there is no way that can be detailed.

Figure 10

Project Scope Management Overview



Note. Adapted from: Project Management Institute, 2017, p.130

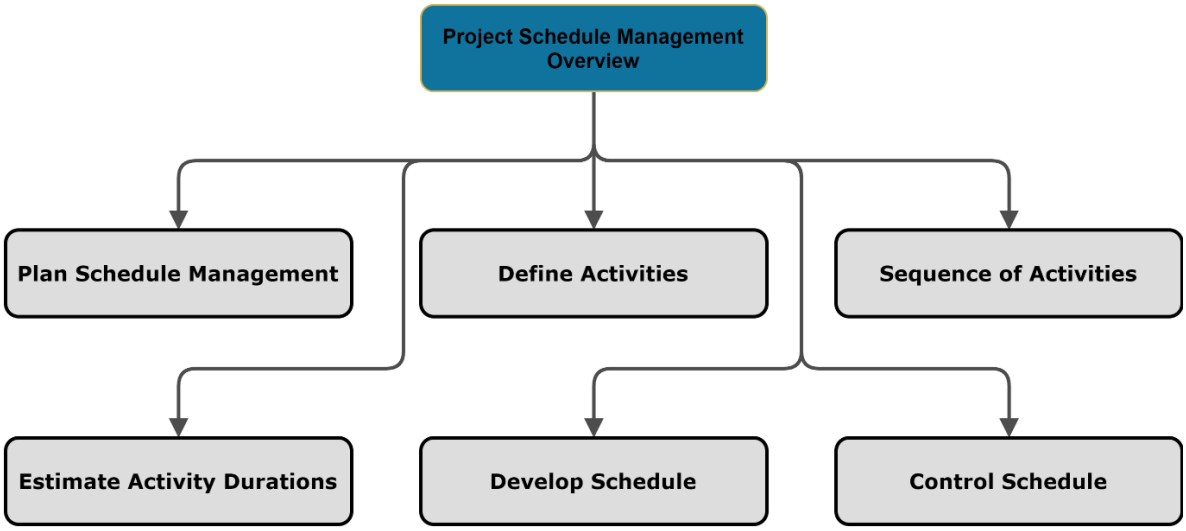
2.2.5.3 Project Schedule Management

Project Schedule management is the knowledge area where the schedule of the project is created which includes all the activities required to manage the completion of the project in the estimated time. Within this process, start dates and deadlines are defined, it is core to know when products, services or results must be delivered. This plan includes the relation and sequence between activities where the critical path method can be applied. The critical path is “used to estimate the minimum duration and determine the amount of schedule flexibility on the logical network within the schedule model.” (Project Management Institute, 2017, p. 210) “The schedule management plan generated within this process will be used as a communication tool that will be used to inform stakeholders the project status” (Lledó, 2017).

Figure 11 shows an overview of the project schedule management processes.

Figure 11

Project Schedule Management Overview



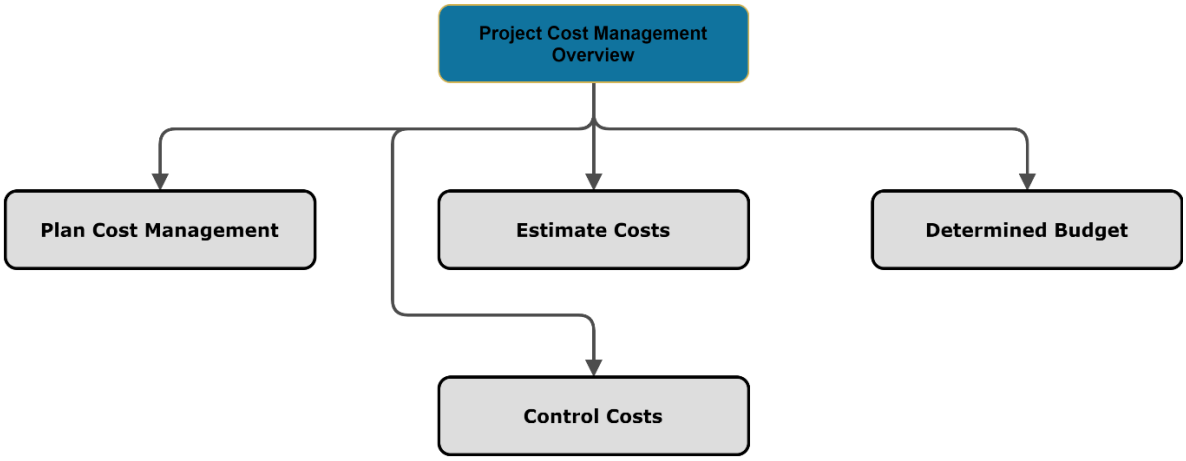
Note. Adapted from: Project Management Institute, 2017, p.174

2.2.5.4 Project Cost Management

Once activities are defined it is necessary to include the charging related to each activity and resources needed to perform them. The project Cost Management includes “the processes involved in planning, estimating, budgeting, financing, funding, managing, and controlling prices, so, the project can be completed within the approved budget”. Cost refers to how much money will be need it to complete the activity and budget is how much money we have to complete the activity. Once activities started the cost compared with the budget in order to evaluate the performance of the project. To understand the project cost management, **Figure 12** shows an overview of the process:

Figure 12

Project Cost Management Overview



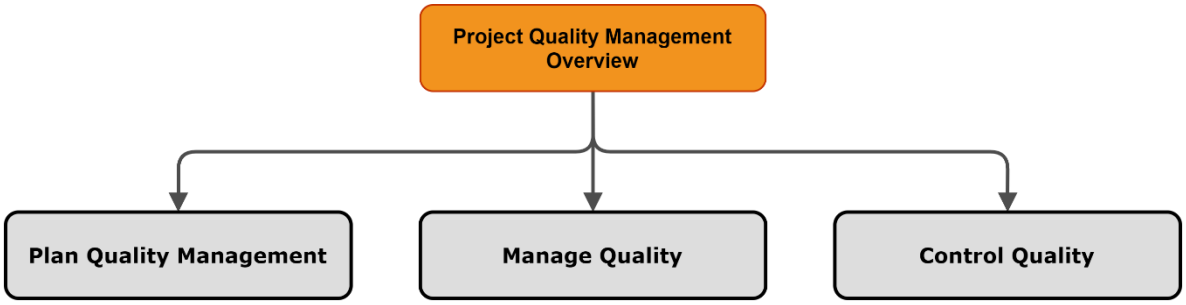
Note. Adapted from: Project Management Institute, 2017, p.232

2.2.5.5 Project Quality Management

Quality is an important fact that must be considered in every project, the proper management of the quality helps to prevent mistakes or defects, reprocesses or duplicating the task, in order to meet common objectives of each project which should be sustained customer's satisfaction. This project management knowledge includes "the processes for incorporating the organization quality policy regarding to planning, managing, and controlling the project and product quality requirements in order to meet the stakeholders' objectives" (Project Management Institute, 2017, p. 271). In order to achieve quality requirements, it is necessary to compare results with the quality metrics and requirements, ensuring that deliverables are meeting what was defined at the beginning of the project and are among the boundaries within the acceptance criteria defined by the stakeholders. **Figure 13** shows the project quality management overview.

Figure 13

Project Quality Management Overview



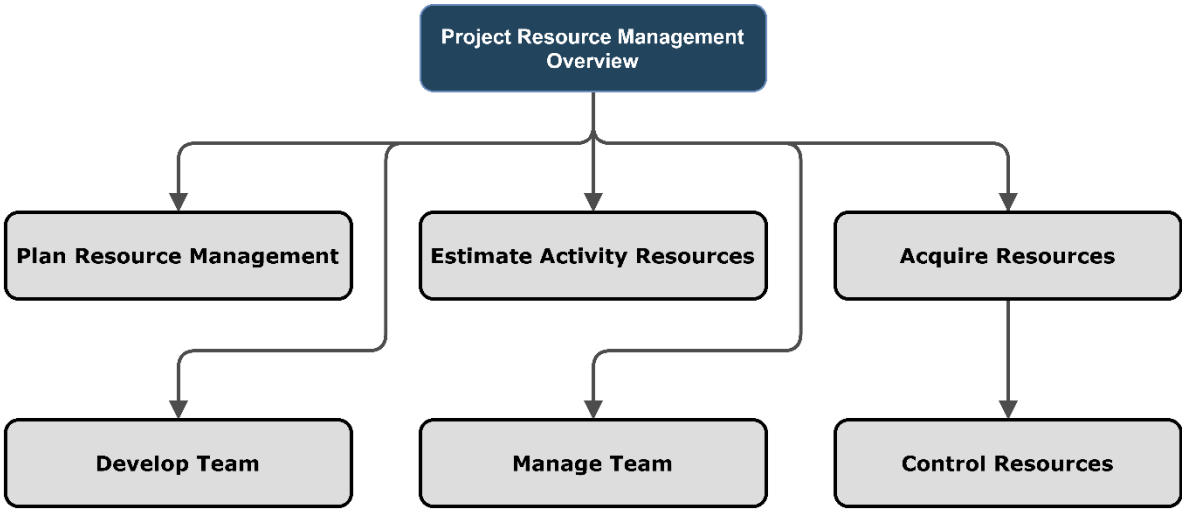
Note. Adapted from: Project Management Institute, 2017, p.272

2.2.5.6 Project Resource Management

To develop a project, it is necessary to define the resources that will be needed to execute the project in advance, resources can be human resources or equipment, materials, facilities, etc. Within the Project Resource Management Knowledge, the activities required to “identify, acquire and manage the resources” (Project Management Institute, 2017, p. 307), are included. This process is highly important due to resource requirements that can affect the schedule baseline, some resources are not available locally or special skills or abilities are needed, so, time to acquire them must be taken into account. This process needs the project manager to get enrolled with leadership and manager at the same time, it is necessary to remember, that people are unique and soft skills will be needed to develop a high performance team, an excellent work environment, skills and competencies that will enhance the chances of achieving the objectives. Figure 14 provides an overview of this knowledge area

Figure 14

Project Resource Management Overview



Note. Adapted from: Project Management Institute, 2017, p.308

2.2.5.7 Project Communication Management

This knowledge area applies strategies and activities to ensure that information is distributed within the project based on communication strategies, the main skill needed by a project manager is communication. The PMBOK defines it as a knowledge area that includes all the “necessary processes to ensure that the information needs of the project and its stakeholder are met through development of artifacts and implementation of activities designed to achieve effective information exchange” (Project Management Institute, 2017, p. 359). The Communication is the exchange information (it is necessary two or more parties to exist), which can be through different mechanisms as written forms, spoken, formal and informal, through gestures, media or choice of words (Project Management Institute, 2017, p. 360). Communication must be effective and efficient:

Effective Communication: Provide the communication in time and form required.

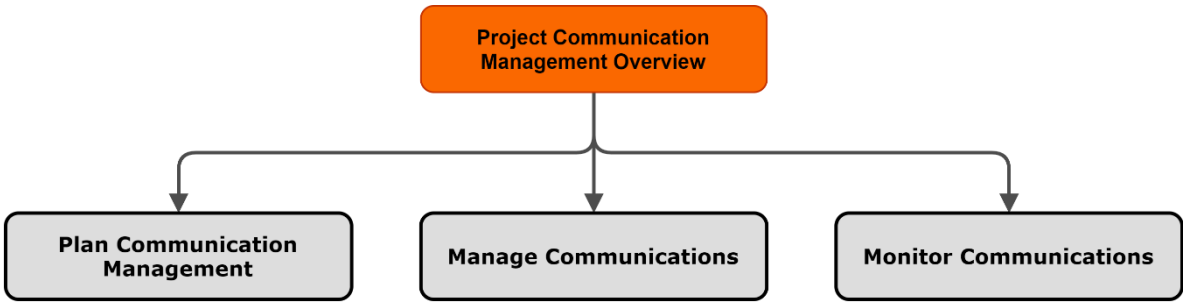
Efficient Communication: To share just relevant information that was required.

(Boyde, 2014, p. 171)

Project Communication Management overview is shown in **Figure 15**

Figure 15

Project Communication Overview



Note. Adapted from: Project Management Institute, 2017, p.360

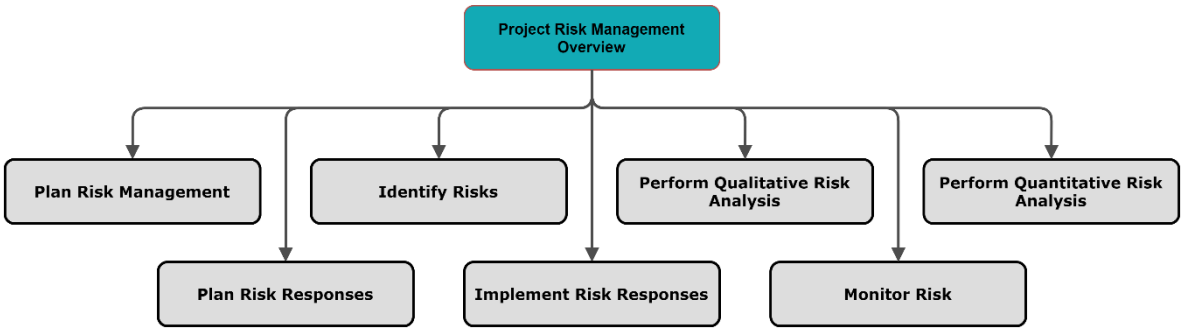
2.2.5.8 Project Risk Management

This project management area considers all the threats that can generate problems that delay the project's development or those factors that can enhance or increase the chances of success called opportunities. Within the project concept the risk is something natural, as all projects are unique there will be many variables that cannot be controlled and can affect the project development. The main objective of the risk project management is to increase the odds for opportunities to happen and reduce the chances of risk. Within this process it is necessary to think what can go wrong and it is the responsibility of the project management team to maintain the balance, knowing how to respond once risks appear. The project risk management process includes "risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project" (Project Management

Institute, 2017, p. 395). **Figure 16** shows an overview of the processes within this knowledge area.

Figure 16

Project Risk Management Overview



Note. Adapted from: Project Management Institute, 2017, p.396

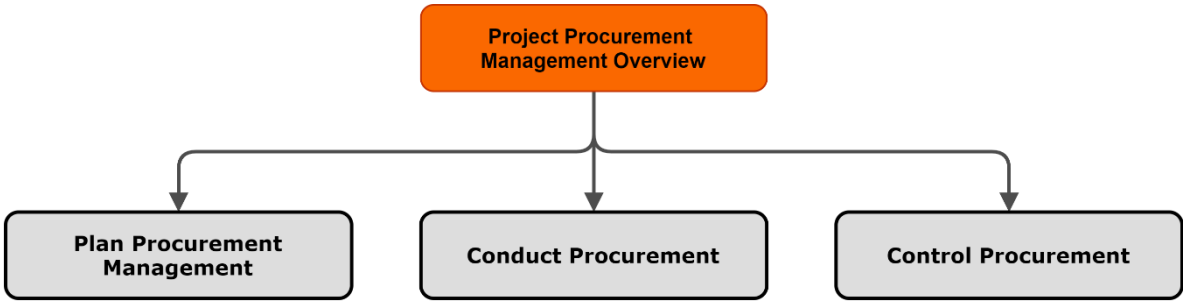
2.2.5.9 Project Procurement Management

This knowledge area includes “the necessary process to purchase or acquire products, services, or results needed from outside the project team” (Project Management Institute, 2017, p. 459) This process defines if resources will be acquire outside or inside the project, due to this process could be complex and interacts with other processes, the PMBOK represents the procurement Management as a discrete process from the viewpoint that outside resources will be procured in order to fulfill projects requirements, this can include goods or services. This process requires the participation of authorized members, thus, they can acquire the legal obligations and penalties that are tied to this process, which involves agreements where requirements are established, the same as responsibilities from both parties. It is important to understand the difference between procurement and purchase, which sometimes can be considered as synonyms. Procurement processes

globalize a complex process where the strategy is most important and details how goods and services will be acquired. On the other hand purchase is the transactional activities where payment is done once the goods and services were received or depending on the contract's agreements. **Figure 17** shows an overview of the procurement management.

Figure 17

Project Procurement Management Overview



Note. Adapted from: Project Management Institute, 2017, p.460

2.2.5.10 Project Stakeholder Management

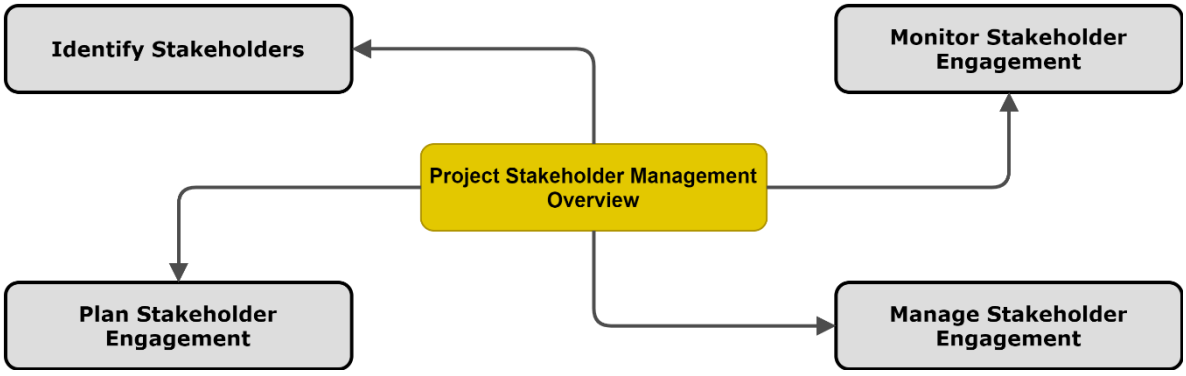
Projects drive change and are executed in order to move the organization from one state to another. All these changes affect people within or outside the project so this Project knowledge area is in charge of managing all stakeholders that are part of the project or those affected directly or indirectly by its execution. Stakeholders can lay within two categories; first of all, primary stakeholders are the ones affected directly by the project's outcomes. The latter, the other hand Secondary Stakeholders influence the project's outcome and are affected by it. The Project stakeholder Management area "includes the processes required to identify the people, groups, or organization that could impact or be impacted by the project, to analyze stakeholders expectation and their impact on the project, and to develop appropriate

management strategies to effectively engaging stakeholders in project decisions and execution" (Project Management Institute, 2017, p. 503) The participation of the project manager within the activities related to managing project's stakeholder specification is crucial to increase the chances of success, additionally they are in charge of developing communication strategies to involve stakeholders within the project decision making. "Stakeholder satisfaction should be identified and managed as a project objective" (Project Management Institute, 2017, p. 505)

Figure 18 provides a better overview of the project stakeholder management processes.

Figure 18

Project Stakeholder Management Overview



Note, Adapted from: Project Management Institute, 2017, p.504

2.3 Other applicable theory

2.3.1 System Development Life Cycle

The System Development Life Cycle (SDLC) method is a process to develop information systems through the development of various phases, which supports the project managers to create design plans and execute the project. This method is tailored specifically “towards the creation, alternation, and maintenance of software applications, hardware platforms, and information technology system” (Boyde, 2014, p. 49)

The phases of the SDLC method are shown in **Figure 19** and are as follow:

Requirements/Specification: In this stage, business requirements (goals) are established, the project members generate interviews with users of the system and generate conceptual modules of the system (data modeling).

Design: Describes features and operations that are requested by the final users, this can include layouts, business rules, diagrams etc.

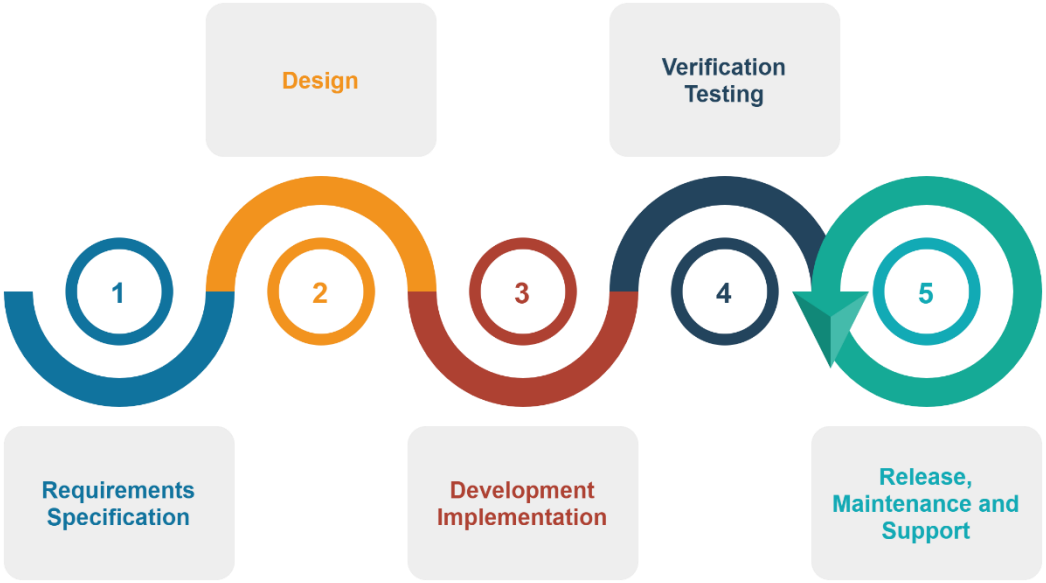
Development/Implementation: During this stage commands are written and executed to create the system, data are introduced and user documents are developed, help menus and operation manual.

Verification/Testing: The program is tested, errors are checked, bugs and operation. Feedback is received by the final users in order to implement corrections and some adjustments.

Release, Maintenance and Support: The system is putt into the production within the business processes. During this stage the project team is in charge to apply corrections, changes, additions requested by users and those that can increase the system performance. This stage can be carried out several times until achieving the customer requirements. (VIEWNEXT, 2018)

Figure 19

SDLC Phases



2.3.2 Entity Relationship Diagrams

Entity Relations Diagrams (ERD) is a structural diagram used in database design, where all entities and attributes relations are represented, it provides background information related to entities, data type and restrictions. The ERD captures all the necessary information of the business guaranteeing that the information data appears once and storage that information in a logical place that can be found efficiently. “Database is absolutely an integral part of software system. (Visual Paradigm, 2021)” Using ERD in database engineering guaranties a high quality database.

The development of an ERD needs the use of specific notations and terms, as entities, attributes and relationships, as follow:

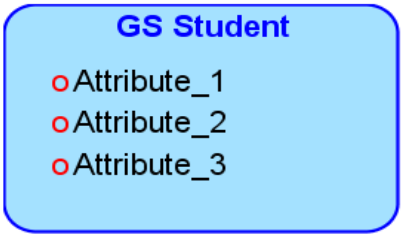
Entity: “Is a definable thing or concept within a system, such a person/role, object, concept or event. (Sometimes the term Entity is used instead of table)” (Visual Paradigm, 2021)

Entity Attributes: “Also known as columns, an attribute is a property or characteristic of the entity that holds it” (Visual Paradigm, 2021) e.g. the attributes of a person can be age, name, address, phone number etc.

An entity and its attributes are represented as it is shown in **Figure 20**

Figure 20

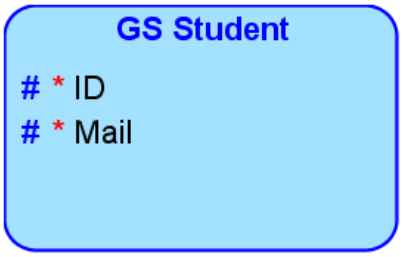
Graphical representation of Entity with its Attributes



Primary Key: Known as PK, “is a special kind of entity attribute that uniquely defines a record in a database table” (Visual Paradigm, 2021). It cannot be two repeated values for the Primary Key. **Figure 21** shows Primary Key are representation within an Entity Diagram with a number sign symbol **(#)**.

Figure 21

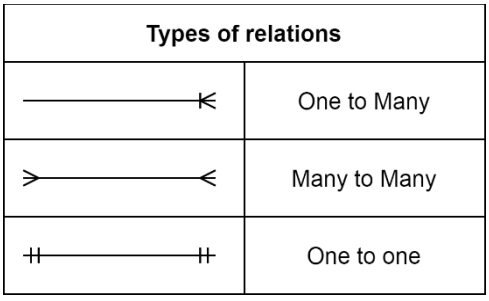
Primary Key representation within an Entity



Relation: means to association between two entities. **Figure 23** shows the relation between “UCI Employee table” and “Department” table. **Figure 22** shows the different type of relations that can exist

Figure 22

Types of Relation

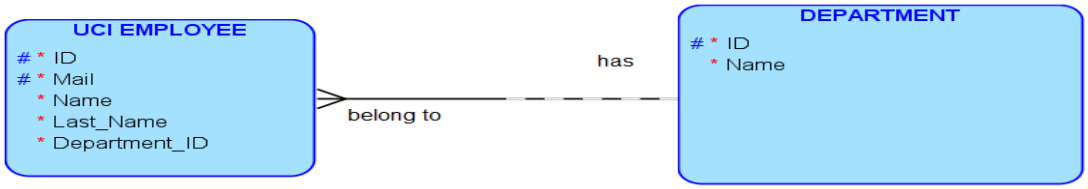


Foreign Key: “Is a reference to a primary key in a table” (Visual Paradigm, 2021), it is used to create a reference between two tables, this value creates a relation of one foreign record that is located in an external table. In **Figure 23** Department ID is a

foreign key within the UCI EMPLOYEE table and generates a reference to a specific value within Department table.

Figure 23

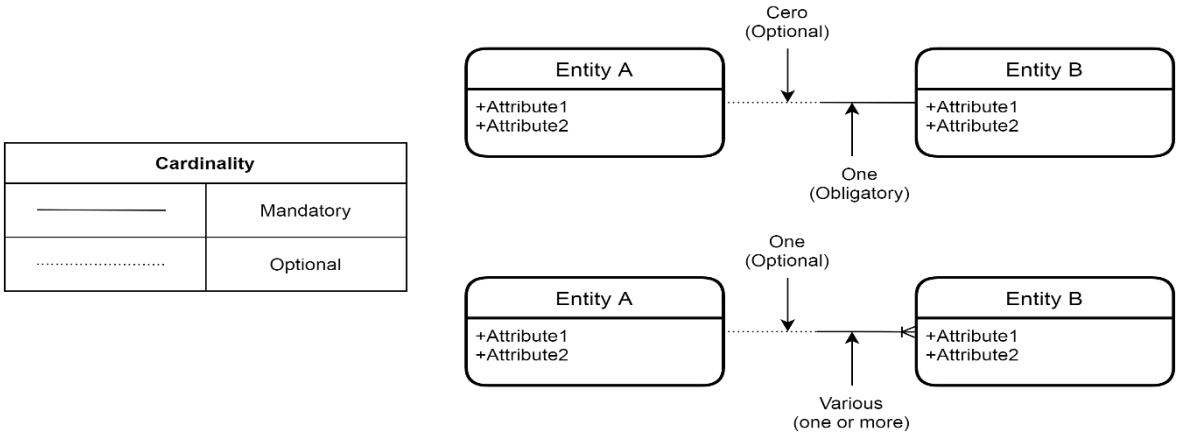
Relation Between two tables



Cardinality: "defines the possible number of occurrences in one entity which is associated with the number of occurrences in another" (Visual Paradigm, 2021) **Figure 24** shows the cardinality between UCI EMPLOYEE table and DEPARTMENT and it says that UCI EMPLOYEE must belong to one DEPARTMENT. On the other hand DEPARTMENT could have one or more UCI EMPLOYEEs.

Figure 24

Cardinality



3. METHODOLOGICAL FRAMEWORK

This section contains methods and actions to be used to collect information needed to understand the problem, stated for this research. In addition, it includes how the data will be collected, needed sources of information and tools. It also contains the assumptions and constraints that exist and that might affect the achievement of the deliverables proposed, thereby, allowing the reader to comprehend how the data was collected and analyzed.

3.1 Information sources

Nowadays, information comes from different sources it is shown in a variety of formats. The term information source makes reference to “source of information for somebody i.e. anything that might inform a person about something to provide knowledge to somebody” (LISBDNETWORK, 2018). It is the composition of two words, the first one, information, which means “facts or details about somebody/something” (Oxford, 2021) and the second one, source, that means “a place, person or thing that you get something from” (Oxford, 2021). In that way it is basically where the facts or details about something comes from.

The gist, information can be found in a variety of formats (print, electronic and audio-visual) and are usually categorized in primary sources and secondary sources.

3.1.1 Primary sources

“Primary sources are original materials on which other research is based” (CSUN University Library, 2017) these sources show information based on original ideas and “constitute the latest available information” (LISBDNETWORK, 2018). It can be

considered as “the information that comes directly from a person or organization” (Edinburg Napier University, 2021). Examples of primary resources are: patents, diaries, newspaper articles, artifacts, photographs, legislation and policy, books, thesis, among others etc. There are many examples of primary information but for the development of this Final Graduation Project the primary sources that will be used are stakeholder’s interviews, legal documents, email communication.

3.1.2 Secondary sources

Secondary sources are those where it is “discussed, interpreted or analyzed as a primary source and other secondary source”. (CSUN University Library, 2017) The secondary sources basically born from the interpretation and comment of a primary source where the original person who provides the information, does not participate. The secondary sources for the development of this Final Graduation Project will be the Project Management Body of Knowledge 6th Edition, PMI databases internet and public database.

Chart 2 shows the primary and secondary resources that will be used for the development of each specific objectives of the Final Graduation Project.

Chart 2

Information Sources

Objectives	**Information Sources**	
	Primary	**Secondary**
1. To create an Integration Management plan that can be used to coordinate a variety of	Workshop's Department Interview, legal	PMBOK Guide.

Objectives	Information Sources	
	Primary	Secondary
activities from the very first beginning to end.	documents, email communication.	
2. To produce the scope management plan to make sure that all required work to develop Warranty Claim System is planned in order to conclude the project.	Workshop's Department Interview, legal documents, email communication.	PMBOK Guide, PMI Database, internet, Honduran Customer Protection Law
3. To create a schedule management plan containing constraining time that can be used as baseline to ensure completion within expected time.	Workshop's Department Interview, Meetings, email communication.	PMBOK Guide.
4. To create cost management plan that will be used as a baseline to complete the project within an expected budget.	Workshop's Department Interview, Meetings, email communication.	PMBOK Guide, PMI Database, internet and public database.

Objectives	Information Sources	
	Primary	**Secondary**
5. To define quality management plan to establish stakeholder's acceptance criteria related to the project deliverables	Workshop's Department Interview, Meetings, email communication.	PMBOK Guide, PMI Database, internet and public database.
6. To create the resource management plan to ensure that all the necessary staff and assets are managed effectively within the schedule, budget and scope baselines planned.	Workshop's Department Interview, Meetings, email communication.	PMBOK Guide, PMI Database, internet and public database.
7. To create a communication management plan defining communicative strategies to exchange information with project's stakeholders.	Workshop's Department Interview, Meetings, email communication.	PMBOK Guide, PMI Database, internet and public database.
8. To create a risk management plan that identifies and analyses each risk that can affect the project's completion,	Workshop's Department Interview, Meetings, email communication.	PMBOK Guide, PMI Database, internet and public database.

Objectives	Information Sources	
	Primary	**Secondary**
reducing the probability and impact of negative risks.		
9. To create the procurement management plan that defines the processes of how needed resources, for the project development, will be obtained.	Workshop's Department Interview, Meetings, email communication.	PMBOK Guide, PMI Database, internet and public database.
10. To create stakeholder's management plan, identifying and supporting strategies, required to guarantee satisfaction of the project's stakeholders.	Workshop's Department Interview, Meetings, email communication	PMBOK Guide, PMI Database, internet and public database

3.2 Research methods

This term refers to how the information will be acquired to further develop of a research, is the way how the researcher designs the study. It is defined as “the strategies, processes and techniques utilized in the collection of data or evidence for analysis in order to uncover new information or create better understanding of a topic” (University of Newcastle Library, 2020)

The research methods can be categorized within two types, qualitative and quantitative research, which depending on the type of research can include specific tools or data collection techniques.

3.2.1 Qualitative Research

This research method tends to seek understanding the nature of the phenomenon and the qualities associated with it. “Gather data about lived experiences, emotions or behaviors, and the meanings individuals attach to them. It assists in enabling researchers to gain a better understanding of complex concepts, social interactions or cultural phenomena.” (University of Newcastle Library, 2020)

3.2.2 Quantitative Research

By contrast, the qualitative research looks to understand “how much” and to consider the magnitude of the variable that it is studied. Quantitative research “gathers numerical data which can be ranked, measured or categorized through statistical analysis. It assists with uncovering patterns or relationships, and for making generalizations. This type of research is useful for finding out how many, how much, how often, or to what extent.” (University of Newcastle Library, 2020)

For the development of this Final Graduation Project the research method that will be used to gather information and for the accomplishment of specific objectives will be the qualitative research, using the interview, document analysis and oral histories, as data collection tools. Detailed information can be found within **Chart 3**.

Chart 3

Research Method

Objectives	**Research Method**
	Qualitative Research
1. To create an Integration Management plan that can be used to coordinate a variety of activities from the very first beginning to end.	Qualitative research method will be employed to primary and secondary sources identified in Chart 2 objective 1, to create the scope management plan.
2. To produce the scope management plan to make sure that all required work to develop Warranty Claim System is planned in order to conclude the project.	Qualitative research method will be employed to primary and secondary sources identified in Chart 2 objective 2, to create the scope management plan.
3. To create a schedule management plan containing constraining time that can be used as baseline to ensure completion within expected time.	Qualitative research method will be employed to primary and secondary sources identified in Chart 2 objective 3, to create the schedule management plan.

Objectives	Research Method Qualitative Research
4. To create cost management plan that will be used as a baseline to complete the project within an expected budget.	Qualitative research method will be employed to primary and secondary sources identified in Chart 2 objective 4, to create the schedule management plan.
5. To define quality management plan to establish stakeholder's acceptance criteria related to the project deliverables	Qualitative research method will be employed to primary and secondary sources identified in Chart 2 objective 5, to create the quality management plan.
6. To create the resource management plan to ensure that all the necessary staff and assets are managed effectively within the schedule, budget and scope baselines planned.	Qualitative research method will be employed to primary and secondary sources identified in Chart 2 objective 6, to create the resource management plan.
7. To create a communication management plan defining communicative strategies to exchange information with project's stakeholders.	Qualitative research method will be employed to primary and secondary sources identified in Chart 2 objective 7, to create the communication management plan.

Objectives	Research Method Qualitative Research
8. To create a risk management plan that identifies and analyses each risk that can affect the project's completion, reducing the probability and impact of negative risks.	Qualitative research method will be employed to primary and secondary sources identified in Chart 2 objective 8, to create the risk management plan.
9. To create the procurement management plan that defines the processes of how needed resources, for the project development, will be obtained.	Qualitative research method will be employed to primary and secondary sources identified in Chart 2 objective 9, to create the procurement management plan.
10. To create stakeholder's management plan, identifying and supporting strategies, required to guarantee satisfaction of the project's stakeholders.	Qualitative research method will be employed to primary and secondary sources identified in Chart 2 objective 10, to identify stakeholders.

3.3 Tools

The term “tool” within this research will be used to refer to “something tangible, such as a template or software program, used in performing an activity to produce a product or result” (Project Management Institute, 2017, p. 725)

Tools used in the Final Graduation Project are identified and explain on the list below, **Chart 4** shows which tools will be used in each specific objective:

- Project Charter Template: provides authority usage of organizational and formalizer the existence project.
- Requirement Traceability Matrix Template: shows the relation between requirements and deliverables, expected.
- Work Breakdown Structure Software: Software used to create the Work Breakdown Structure.
- Requirement Management Plan Template: It describes the analysis and documentation that will be applied to each requisite.
- Scope Management Plan Template: guides how to create the scope management plan which will have the project’s scope.
- Project Management Plan Template: guides and defines the project’s processes.
- Schedule Management Plan Template: it is used to generate the schedule management plan, expected duration and list of activities.
- Microsoft Project: Software used to create the schedule, Gantt Diagram and Critical path analysis.

- Microsoft Excel: Software used to generate tables and analysis required to develop the project's plans.
- Diagram Tools: Online software used to create flow charts and others.
- Activity List Template: List the project's activities.
- Cost Management Plan Template: format used to create and structure the cost management plan.
- Quality Management Plan Template: Guide to create the quality management plan where policies, processes and procedures to achieve quality of objectives, can be found.
- Resource Management Plan Template: Defines the resources management plan structures and its elements.
- Responsibility Assignment Matrix: Shows the project resources which are assigned to develop each work package.
- Communication Management Plan Template: It is used as a guide to generate the communication Management plan, which defines how communications will be managed within the project.
- Communication Matrix: it establishes the relation between communication and project team.
- Risk Management Plan Template: Guides how the risk management plan will be created and how risk management activities will be structured, and performed.
- Risk Register Template: Document used to list all the elements identified as project risk.

- Procurement Management Plan Template: it helps to define how goods and services will be procured outside the project team.
- Stakeholder Register Template: it is used to list, assess and classify project stakeholders.
- Stakeholder Power-Interest Matrix: a grid that establishes the relation between power and interest of identified stakeholders.
- Stakeholder Engagement Assessment Matrix: compares current and desired engagement levels of the registered stakeholders.

Chart 4

Tools

Objectives	Tools
1. To create an Integration Management plan that can be used to coordinate a variety of activities from the very first beginning to end.	Project Management Charter, Project Management Plans, Integration Management Template, Microsoft Word, Microsoft Excel, Microsoft Project.
2. To produce the scope management plan to make sure that all required work to develop Warranty Claim System is planned in order to conclude the project.	Meeting Register Format, Project Management Charter, Work Breakdown Structure Software, Scope Management Plan Template, Requirement Traceability Matrix Template, Scope Management Template
3. To create a schedule management plan containing constraining time that can be used as baseline to ensure completion within expected time.	Meeting Register Format, Microsoft Project, Activity List Template
4. To create cost management plan that will be used as a baseline to	Meeting Register Format, Microsoft Project, Microsoft Excel, Cost Management Template

Objectives	Tools
complete the project within an expected budget.	
5. To define quality management plan to establish stakeholder's acceptance criteria related to the project deliverables	Meeting Register Format, Quality Management Plan Template, Requirements Traceability Matrix
6. To create the resource management plan to ensure that all the necessary staff and assets are managed effectively within the schedule, budget and scope baselines planned.	Microsoft Excel, Resource Management Plan Template
7. To create a communication management plan defining communicative strategies to exchange information with project's stakeholders.	Email, Meeting Register Format, Communication Matrix, Communication Management Plan
8. To create a risk management plan that identifies and analyses each risk that can affect the project's completion, reducing the	Meeting Register Format, Risk Management Plan Template, Risk Register Template

Objectives	Tools
probability and impact of negative risks.	
9. To create the procurement management plan that defines the processes of how needed resources, for the project development, will be obtained.	Meeting Register, procurement management plan, email.
10. To create stakeholder's management plan, identifying and supporting strategies, required to guarantee satisfaction of the project's stakeholders.	Meeting Register Format, Power Interest Matrix, Stakeholder Analysis Chart, Stakeholder engagement assessment matrix.

3.4 Assumptions and constraints

During the project development there are certain facts that cannot be confirmed during the planning phase of the project and those are known as assumptions, which are defined as “a factor in the planning process that is considered to be true, real, or certain, without proof or demonstration” (Project Management Institute, 2017, p. 699) The same as the assumptions are identified, the constraints that can affect the project’s development are identified as well. A constraint is “a limiting factor that affects the execution of a project, program, portfolio or process” (Project Management Institute, 2017, p. 701). Assumptions and Constraints related to the development of the Final Graduation Project are shown in **Chart 5**

Chart 5

Assumptions and Constraints

Objectives	**Information Sources**	
	Assumptions	**Constraints**
1. To create an Integration Management plan that can be used to coordinate a variety of activities from the very first beginning to end.	The integration management plan will contain all required activities to manage and integrate all ten project’s knowledge.	Lack of experience in project management area, can increase the likelihood of not achieving required standards.

Objectives	Information Sources	
	Assumptions	**Constraints**
2. To produce the scope management plan to make sure that all required work to develop Warranty Claim System is planned in order to conclude the project.	The scope management plan will contain all the stakeholders' requirement, including all the work required to develop the project.	The scope may change once the project starts. The scope of the project may not include all required activities due to lack of project management knowledge.
3. To create a schedule management plan containing constraining time that can be used as baseline to ensure completion within expected time.	The schedule management plan will be realistic and according to what stakeholders expect.	Not enough experience to provide an accurate time based in expert guidance.
4. To create cost management plan that will be used as a baseline to complete	The cost management plan will define a precise budget to develop the project.	Not enough experience in project management can affect the budget's accuracy.

Objectives	Information Sources	
	Assumptions	**Constraints**
the project within an expected budget.	The budget will not require changes once it is established.	The project has no budget assigned.
5. To define quality management plan to establish stakeholder's acceptance criteria related to the project deliverables	The quality management plan will contain all the acceptance criteria defined by the stakeholders.	Stakeholder's acceptance requirement can change during project execution.
6. To create the resource management plan to ensure that all the necessary staff and assets are managed effectively within the schedule, budget and scope baselines planned.	The resource management plan will contain staff and assets required to develop the project. The resources management plan will only include resources that the company has and no investments will be required.	There is not enough experience for calculating resources, to develop a project, might increase probabilities to require future updating's. It is possible to require external resources.

Objectives	Information Sources	
	Assumptions	**Constraints**
7. To create a communication management plan defining communicative strategies to exchange information with project's stakeholders.	The communication management plan will include and define all needed elements to communicate project's performance to stakeholders	Due to covid-19, communication is limited through email and virtual meetings.
8. To create a risk management plan that identifies and analyses each risk that can affect the project's completion, reducing the probability and impact of negative risks.	The risk management plan will contain all risk elements and can be used to control upcoming risks.	Lack of experience to calculate risk probabilities and using risk tools. The risk identified list can be uncompleted, due to lack of project management knowledge.
9. To create the procurement management plan that defines the processes	The procurement management plan will define how the project's	Due to covid-19 the communication is limited as for replied from suppliers, could take more

Objectives	Information Sources	
	Assumptions	**Constraints**
of how needed resources, for the project development, will be obtained.	resources will be acquired.	than the expected time. The budget must be minimum, so, procurement process must be focus on local providers.
10. To create stakeholder's management plan, identifying and supporting strategies, required to guarantee satisfaction of the project's stakeholders.	The stakeholders of the project will be identified and categorized based on their impact within the project. The stakeholder's engagement plan will include strategies and techniques to guarantee that their requirements have being achieved	The stakeholder's impact can change during the project's execution. The stakeholder list can increase once the project start. The stakeholders can lose interest in developing the project due to new requirements or needs that can appear during the project execution. Due to the lack of project management knowledge the engagement strategies cannot be effective.

3.5 Deliverables

Deliverable is “any unique and verifiable product, result, or capability to perform a service that it is required to be produced to complete a process, phase, or project”. Deliverables are generated as a result of applying tools and techniques during the project life cycle. **Chart 6** shows the expected deliverable to be produced during the Final Graduation Project:

Chart 6

Deliverables

Objectives	Deliverables
1. To create an Integration Management plan that can be used to coordinate a variety of activities from the very first beginning to end.	Integration Management Plan
2. To produce the scope management plan to make sure that all required work to develop Warranty Claim System is planned in order to conclude the project.	Scope Management Plan
3. To create a schedule management plan containing constraining time that can be used as baseline to ensure completion within expected time.	Schedule Management Plan
4. To create cost management plan that will be used as a baseline to complete the project within an expected budget.	Cost Management Plan

Objectives	Deliverables
5. To define quality management plan to establish stakeholder's acceptance criteria related to the project deliverables	Quality Management Plan
6. To create the resource management plan to ensure that all the necessary staff and assets are managed effectively within the schedule, budget and scope baselines planned.	Resource Management Plan
7. To create a communication management plan defining communicative strategies to exchange information with project's stakeholders.	Communication Management Plan
8. To create a risk management plan that identifies and analyses each risk that can affect the project's completion, reducing the probability and impact of negative risks.	Risk Management Plan
9. To create the procurement management plan that defines the processes of how needed resources, for the project development, will be obtained.	Procurement Management Plan
10. To create stakeholder's management plan, identifying and supporting strategies, required to guarantee satisfaction of the project's stakeholders.	Stakeholder Management Plan

4. RESULTS

This chapter describes each of the project management plans, which were developed during the Final Graduation Project. Each plan includes internal or external inputs of the project, that were required along the process. It also describes the tools and techniques that were used to perform the activity that produced as a result each of the deliverables expected as was described on the specific objectives.

4.1 Project Integration Management

The first objective of the development of this project is to create the Integration Management plan of the project that can be used to coordinate activities that are necessary to develop the project. As explained by the Project Management Body of Knowledge, the first step required is to develop the project Charter which is defined as a “document that formally authorized the beginning of the project” (Project Management Institute, 2017, p. 70). This document is signed by the project sponsor, who defines within the project charter the project manager and its level of authority during the project life.

It also contains the following information: Business case, objectives, requirements, general description, risks, assumptions and constraints, schedule summary, budget, deliverables, project manager, stakeholder and project sponsor. The development of the project charter requires the use of different techniques that facilitate the collected data and exchange of ideas, considering meeting as a main source of information.

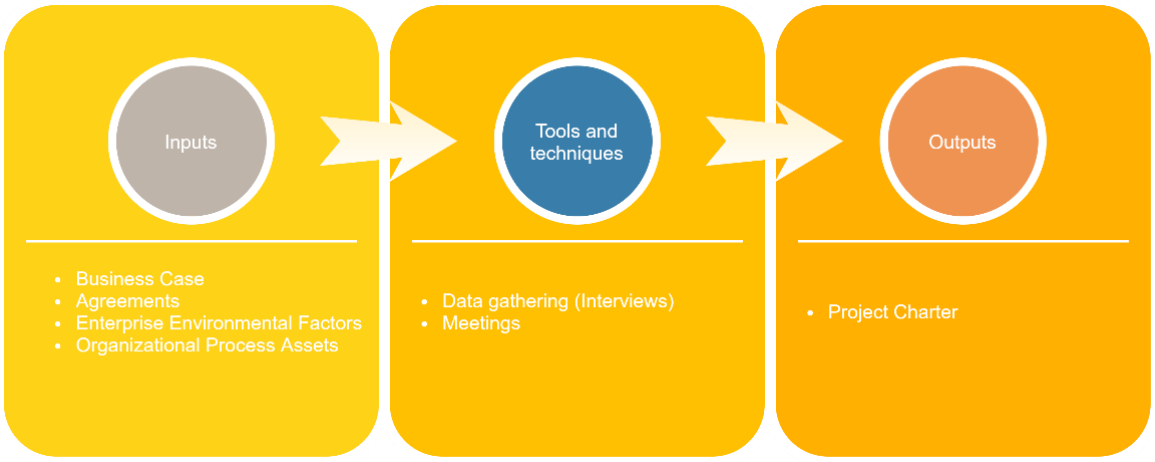
Since, DICOSA does not have a specific project charter template or historical information related to development of projects, neither a formal project management

team ,or a project management office, it was necessary to develop a project charter document which can be used as a guide for further implementations within DICOSA's processes.

Figure 25 shows the inputs, tools and techniques that were used to develop the project charter

Figure 25

Development of the Project Charter



Note. Adapted from: Project Management Institute, 2017, p. 75

Document Tracking (Project Charter)

General Information

	Information
Document Id	001-DCSA-IMP
Document Owner	Distribuidora Comercial S.A.
Issue Date	August 03,2021
Last Saved Date	August 03,2021
File Name	Project Charter

Change Control

Version	Issue Date	Changes
1.0	August 03,2021	None

Approvals

Role	Name	Signature	Date
Project Sponsor	Konny Nehring		
Project Manager	Victor Suazo		

4.1.1 Project Charter

DICOSA DISTRIBUIDORA COMERCIAL S.A.	**Project Charter**	
Version 1.0	Document ID: 001-DCSA-IMP	08/03/2021

Project Name:	Development of a Warranty, Claim Analysis System
Company Name:	Distribuidora Comercial S.A.
Date	August 03, 2021

Business Case
Distribuidora Comercial S.A well known as DICOSA is a Honduran company located in Tegucigalpa, specialized in surgical, medical equipment selling for hospitals, laboratory supplies, biomedical specialized maintenance among others, covering Honduras. It strong legal regulation is added to foster the company´s best reputation and to enhance its after sale services. Consumer protection law and its regulations establish that: “Provider commits total and free repairing of defected equipment, due to assembling, damaging or thirds affected. All sellers are committed to offer same warranty extended by original manufacturers" (Fiscalia del Consumidor, 2008). This requirement within the law, forces companies to accomplish with all legal procedures in order to sell any kind of goods. The responsibility of warranty repairs lies on DICOSA’s workshop department, where currently there is no internal warranty policy, defined processes or a warranty system that allows the workshop personnel to evaluate the warranty coverage of the equipment sold by the company, or to store information related to

warranty procedures. As a result, there is neither traceability, nor relation of the warranty offered by the matrix house, nor the warranty offered to the end consumer. This warranty coverage should be signed in a formal contract that provides legal backing to both customers and company.

To avoid legal problems complying with Honduran Law and increase the customer satisfaction related to after sales service process, it is necessary to develop a system that permits the company to track all units sold, the warranty coverage, conditions compliance, the warranty policy within a database that permits to collect and store evidence, warranty claims and resolution given to customers

Objective

To create a warranty management system that can be used to analyze, approve, deny and record warranty claims from customers.

Specific Objectives

- To design a database model that can be used to record information of warranty claims.
- To design an interface, where the user can interact and create warranty claims to be approved by the warranty administrator.
- To develop a platform where the warranty management system can be used.

Stakeholders

Direct Stakeholders	Indirect Stakeholders
- Head of Service - Service Supervisors - Biomedical Technician - IT Department	- Customers - Sales staff - Customer Protection Officers - Biomedical equipment manufacturer

Preliminary Scope

The project consists in the creation of a platform that can be used to manage warranty claims from customers who have bought biomedical equipment and present problems from factory faults and that can be covered under the warranty given by the original manufacturer.

Requirements

- The platform should be, accessible through common internet browsers own by the intranet company.
- The platform should require a user and password.
- The platform should be managed by the IT department.
- The platform should acquire information from current repair orders.
- The warranty claims can only be created for those biomedical equipment which possess a repair order with status Open
- The platform should be capable to register the following information:
  - Call ID (Repair Order)
  - Customer complaint
  - Technician Diagnosis
  - Solution given
  - Spare parts need it to fix the problem
  - Other resources as materials or chemicals used.
  - Labor time
  - Repair Date
  - Claim Serial
  - Comments

- Technician ID

- The platform should be able to file documents with the following formats: PNG, JPG, JPEG, PDF, MP4 or any other media files:
  - Repair Order Picture
  - Serial number of the biomedical equipment picture
  - Defect evidence pictures or videos.
- The platform should contain database of all the equipment sold by DICOSA and base on the delivery date (retail date when the customer bought the equipment). Based on this delivery date, the platform should calculate the warranty end date, depending on the warranty coverage given by the original manufacturer.
- An automatic reply will sent to people enrolled with the process in the following cases (The email will be send it to the head of service and a copy to the user, who creates claims):
  1. Once the user sends the warranty claim.
  2. Once the administrator user evaluates the claim and selects the approval or denial status.
- The head of service is in charge of approval or denying the warranty claims.
- Once the claim has been denied or approved, the user cannot modify the warranty claim, being necessary to create another.
- The Claim serial should be given automatically by the platform and cannot be repeated, and should be created using a code to designate the agency where

the claim was created, plus an integer number, starting from the 1 which will increase +1.

- Once the user has sent the warranty claim to be analyzed, the status of the order will be set as pending.
- The platform should be developed for web browser users.
- The platform must have two different interfaces:
  - **User interface**: is where the supervisor or technician creates the warranty claim.
  - **Administrator interface**: where all the warranty claims are received and approved or denied status can be applied for each warranty case.
- The platform should be able to generate automatic reports, based on a range of dates given by the users, which includes the information the warranty cases approved, rejected and pending of approval.

Assumptions

- There is complete information related to equipment sold by DICOSA.
- All the equipment has a defined warranty time coverage.
- The Information and Technology (IT) department will be able to develop the platform.
- Once the platform is ready, technicians and supervisor staff will have access to computers in order to use the platform.
- There is an internal server where the information can be stored.

Constraints

- There are no chances of adding extra budget to develop the platform.
- The current technology and equipment should be used to create the platform.
- Due to Covid-19 the communication and platform reviews will be done through online meetings.

Risk

- If the IT department does not have the necessary software to program and develop the platform, it will be necessary to acquire, it might result in increasement of project cost.
- If the company's servers have limited space, it will be necessary to acquire new ones, increase their capacity or to contract space in the cloud.
- If the technician has limited access to computers, it will be necessary to buy equipment.
- If there is no internet connection, due to power outages or others, the warranty process can be delayed.

Budget

Cost Estimate	$1661.10
Cost Baseline	$2022.21
Total Project Budget	$2188.32

Milestones

Name	Start Date	Finish Date
Analysis	03/08/2021	10/08/2021
Design	01/09/2021	15/09/2021
Development	16/09/2021	15/10/2021
Testing	19/10/2021	03/11/2021

Implementation	04/11/2021	05/11/2021
Training	08/11/2021	15/11/2021
Documentation	16/11/2021	19/11/2021

Project Approval		
Position	**Name**	**Signature**
Project Manager	Victor Aly Suazo Valladares	
Project Sponsor	Konny Nehring Amador	

4.1.2 Business Case

The workshop department requires a new platform where warranty claims can be managed from customer complain reception to the case solution. To develop this project is required that IT department create the new platform following the next requirements:

- The platform should be, accessible through common internet browsers own by the intranet company.
- The platform should require a user and password.
- The platform should be managed by the IT department.
- The platform should acquire information from current repair orders.
- The warranty claims can only be created for those biomedical equipment which possess a repair order with status Open
- The platform should be capable to register the following information:
    - Call ID (Repair Order)
    - Customer complaint
    - Technician Diagnosis
    - Solution given
    - Spare parts need it to fix the problem
    - Other resources as materials or chemicals used.
    - Labor time
    - Repair Date
    - Claim Serial
    - Comments

- Technician ID

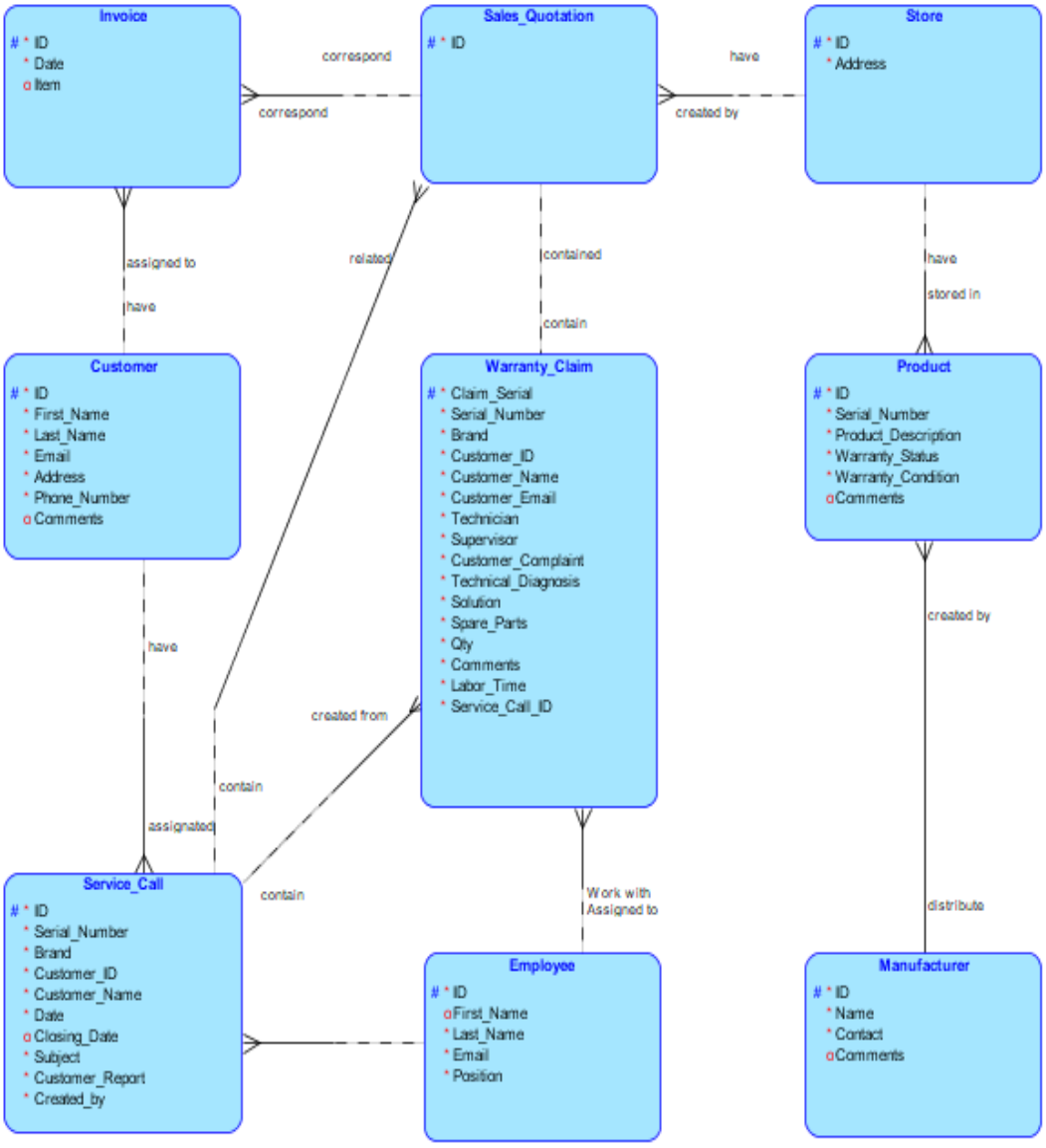
- The platform should be able to file documents with the following formats: PNG, JPG, JPEG, PDF, MP4 or any other media files:
  - Repair Order Picture
  - Serial number of the biomedical equipment picture
  - Defect evidence pictures or videos.
- The platform should contain database of all the equipment sold by DICOSA and base on the delivery date (retail date when the customer bought the equipment). Based on this delivery date, the platform should calculate the warranty end date, depending on the warranty coverage given by the original manufacturer.
- An automatic reply will sent to people enrolled with the process in the following cases (The email will be send it to the head of service and a copy to the user, who creates claims):
  1. Once the user sends the warranty claim.
  2. Once the administrator user evaluates the claim and selects the approval or denial status.
- The head of service is in charge of approval or denying the warranty claims.
- Once the claim has been denied or approved, the user cannot modify the warranty claim, being necessary to create another.
- The Claim serial should be given automatically by the platform and cannot be repeated, and should be created using a code to designate the agency where the claim was created, plus an integer number, starting from the 1 which will increase +1.

- Once the user has sent the warranty claim to be analyzed, the status of the order will be set as pending.
- The platform should be developed for web browser users.
- The platform must have two different interfaces:
  - **User interface**: is where the supervisor or technician creates the warranty claim.
  - **Administrator interface**: where all the warranty claims are received and approved or denied status can be applied for each warranty case.
- The platform should be able to generate automatic reports, based on a range of dates given by the users, which includes the information the warranty cases approved, rejected and pending of approval.

Figure 26 shows the Entity Relation Diagram to create the database needed to develop the platform.

Figure 26

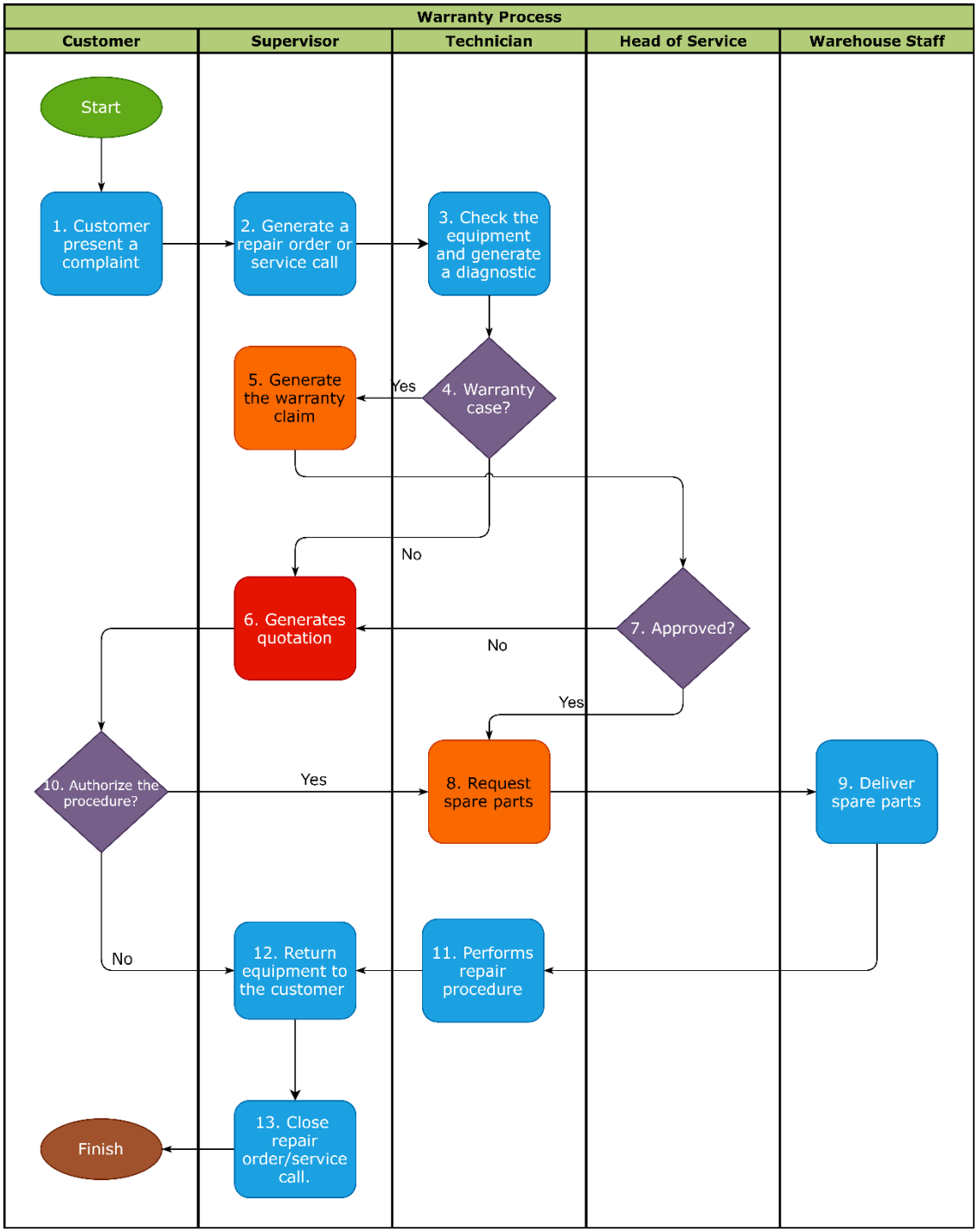
ERD Warranty Management System



Once the platform is set, the process shown in **Figure 27** will be applied within the internal processes in the workshop department to attend warranty cases:

Figure 27

Warranty Process



Process Description

1) **Customer files a complaint:** The customer attends DICOSA with the biomedical equipment or any other sold by DICOSA reporting malfunction problems.
2) **Supervisor generates a repair order/service call:** All equipment received by the workshop must have a repair order/service call opened in the system. This document must be registered within the system and contain the following information:
    - Call ID
    - Equipment Serial
    - Equipment Brand
    - Customer Code
    - Customer Name
    - Date of open
    - Closing Date
    - Subject
    - Customer's report
3) **Check the equipment and generate a diagnostic**: Once the equipment has an open order, the biomedical technician proceeds to check the equipment and generates a diagnostic detailing reasons of the problem, procedures and spare parts, needed to solve the problem.

4) **Warranty Case**: The diagnostic generated in step 3, determines if the problem reported by the customer is generated due to a factory fault, preventive maintenance or corrective maintenance.
5) **Generate the warranty claim**: In those cases the biomedical technician determines that the problem is generated due to factory fault, the service supervisor will generate the warranty claim through the Warranty Management System.
6) **Generate the quotation**: In both cases, even though, it is not a warranty case or if warranty is not approved, the service supervisor generates the quotation that must be delivered to the customer.
7) **Warranty claim, approved?:** Once the head of service receives a warranty claim, through the Warranty Management System, a decision will be made based on the warranty conditions and warranty start date.
8) **Request spare parts:** The technician prepares the spare parts request that must be delivered to the warehouse staff.
9) **Deliver spare parts:** Once the warehouse staff receives the spare part request, he prepares the repair package and delivers it to the technician who will sign the receipt of the parts.
10) **Authorized procedure:** Cases that are not covered by warranty require customer authorization to proceed with the reparation and corrective activities, expressed within the quotation.
11) **Repair procedure's performance:** Once the technician receives the spare parts requested, he starts with the required procedure to repair the equipment.

12) **Returning equipment to the customer:** In both cases, if reparation was done (status complete) or if the customer does not authorize the repair procedure, the service supervisor returns the equipment to the customer and explains, both, the work done by the technician and the current status of the components. The customer receives the equipment and signs in compliance of the work done or accepting that he does not want to do the repair with the company.

13) **Close repair order/service call:** Once the equipment has been returned to the customer and the repair order was signed in, the service supervisor proceeds to close the repair order.

4.1.3 Change Management Process

Project changes must be requested, analyzed, approved, implemented, reviewed and documented, through the project change management process. This process defines steps that stakeholders, project sponsors and project staff must follow in order to request a change, the people in charge of approving changes and how the change will be documented. Figure 28 shows the change management process.

Change Request: All change requests must be done using the change request format.

Impact Analysis: The project manager analyzes the implications of applying changes and other possible solutions. Results must be documented within the change request format.

Approve or Deny: Once the analysis is done, the project sponsor provides its resolution. Decisions taken must be documented within the change request format.

Implementation: If changes are approved, the project team applies the changes.

Figure 28

Change Management Process

Track and Reporting: Changes implemented must be tracked and any update or advance must be reported daily to the project manager.

Storage Information: Once the process is completed, results must be documented within the change request format and store to be used in future projects.

Appendix 4: Change Request Format contains the format used to document and track changes within the project.

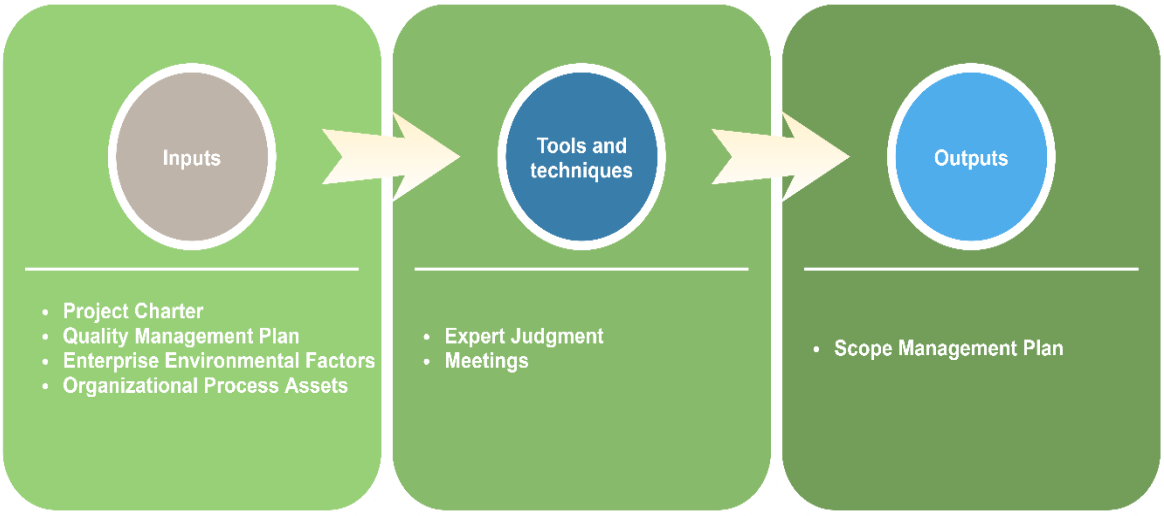
4.2 Project Scope Management

The Project scope management plan was developed once the project charter was completed and includes all needed activities to complete the project with the stakeholders' requirements. This plan includes: the scope framework of the project and all the related information on how the project deliverable will be defined, validated and controlled.

Figure 29 explains the inputs used to generate the project scope management plan, tools and techniques applied to produce the document.

Figure 29

Development of the Scope Management Plan



Note. Adapted from: Project Management Institute, 2017, p. 134

The scope management includes all requirements related to the project's deliveries and all work packages needed to develop it, which assures the achievement of project goals. These work packages are included within the Work Breakdown Structure (Figure 30), and it is detailed within Work Breakdown Structure Dictionary in Chart 9.

Document Tracking (Scope Management Plan)

General Information

	Information
Document Id	003-DCSA-SMP
Document Owner	Distribuidora Comercial S.A.
Issue Date	August 04,2021
Last Saved Date	August 04,2021
File Name	Scope Management Plan

Change Control

Version	Issue Date	Changes
1.0	August 04,2021	Release

Approvals

Role	Name	Signature	Date
Project Sponsor	Konny Nehring		
Project Manager	Victor Suazo		

4.2.1 Scope Management Plan

DICOSA DISTRIBUIDORA COMERCIAL S.A.	**Scope Management Plan**	
Version 1.0	Document ID: 003-DCSA-SMP	08/04/2021

Scope Statement

The project scope statement provides a detailed description of each project deliverables, specific requirements and product scope. In addition to this information, the scope statement includes the exclusions and boundaries of work activities that are not included within the project scope, in order to avoid misunderstandings or unnecessary work under project staff responsibility, affecting the project development efficiency.

Project Requirements

Requirements are listed based on the workshop department needs and the legal requirements. The following chart shows the identified requirements along with the head of service of DICOSA's workshop:

Requirements
– The platform should be, accessible through common internet browsers own by the intranet company. – The platform should require a user and password. – The platform should be managed by the IT department.

Requirements

- The platform should acquire information from current repair orders.
- The warranty claims can only be created for those biomedical equipment which possess a repair order with status Open
- The platform should be capable to register the following information:
  - Call ID (Repair Order)
  - Customer complaint
  - Technician Diagnosis
  - Solution given
  - Spare parts need it to fix the problem
  - Other resources as materials or chemicals used.
  - Labor time
  - Repair Date
  - Claim Serial
  - Comments
  - Technician ID
- The platform should be able to file documents with the following formats: PNG, JPG, JPEG, PDF, MP4 or any other media files:
  - Repair Order Picture
  - Serial number of the biomedical equipment picture
  - Defect evidence pictures or videos.
- The platform should contain database of all the equipment sold by DICOSA and base on the delivery date (retail date when the customer bought the

Requirements
equipment). Based on this delivery date, the platform should calculate the warranty end date, depending on the warranty coverage given by the original manufacturer. – An automatic reply will sent to people enrolled with the process in the following cases (The email will be send it to the head of service and a copy to the user, who creates claims): 1. Once the user sends the warranty claim. 2. Once the administrator user evaluates the claim and selects the approval or denial status. – The head of service is in charge of approval or denying the warranty claims. – Once the claim has been denied or approved, the user cannot modify the warranty claim, being necessary to create another. – The Claim serial should be given automatically by the platform and cannot be repeated, and should be created using a code to designate the agency where the claim was created, plus an integer number, starting from the 1 which will increase +1. – Once the user has sent the warranty claim to be analyzed, the status of the order will be set as pending. – The platform should be developed for web browser users. – The platform must have two different interfaces: • **User interface**: is where the supervisor or technician creates the warranty claim.

Requirements
• **Administrator interface**: where all the warranty claims are received and approved or denied status can be applied for each warranty case. – The platform should be able to generate automatic reports, based on a range of dates given by the users, which includes the information the warranty cases approved, rejected and pending of approval.

Requirement Traceability Matrix

Chart 7

Requirement Traceability Matrix

Project Name:	Development of a Warranty, Claim Analysis System
Project Objective:	To create a warranty management system that can be used to analyse, approve, deny and record warranty claims from customers.

ID	Requirement Description	Requested by	WBS	Priority	Responsible	Aditional Comments
1	Warranty platform that can be accessed through internet browsers.	Project sponsor	2.2	High	IT Department	
2	Access will be personalized and it requires the user's and password.	Project sponsor	2.2	High	IT Department	
3	DICOSA's IT department will have full control of the database and program setup.	Project sponsor	2.2	High	IT Department	
4	Information inserted within the warranty request should be stored in the server.	Project sponsor	3.3	High	IT Department	
5	Warranty claims can be created only for those equipment who have a repair order with open status.	Project sponsor	3.2	High	IT Department	
6	Following information should be recorded: Call ID (Repair Order), Customer complaint, Technician Diagnosis, Technical Solution, Spare parts needed to fix the problem, other	Project sponsor	2.1	High	IT Department	

ID	Requirement Description	Requested by	WBS	Priority	Responsible	Aditional Comments
	resources as materials or chemicals used, Labor time, Repair Date, Claim Serial, Comments,Technician ID					
7	Evidence that supports the warranty claim must be submitted, file format accepted: PNG, JPG, JPEG, PDF, MP4 or any other media file.	Project sponsor	2.1	High	IT Department	
8	The user should be able to categorize the evidence among these types: Repair Order, Serial Number, Defect evidence, others.	Project sponsor	2.1	High	IT Department	
9	The platform should be able to consult information about the current database, customer's information and equipment information.	Project sponsor	2.2	High	IT Department	
10	The platform should send an email to notify the creation and status change to service staff involved in the process.	Project sponsor	3.2	High	IT Department	
11	Each case can be approved or denied, or remains in pending status.	Project sponsor	2.1	High	IT Department	
12	To maintain reliability of information, once the warranty was sent, the user is not able to modify information.	Project sponsor	3.2	High	IT Department	

ID	Requirement Description	Requested by	WBS	Priority	Responsible	Aditional Comments
13	The platform will assign an ID number, which is composed by an integer number starting from the number 1.	Project sponsor		High	IT Department	
14	The platform will have two different interfaces: • **User interface**: where warranty claims are created. • **Administrative interface**: where warranty claims are received, analyzed and approved or denied.	Project sponsor	2.3	High	IT Department	
15	The administrator interface must contain an option to generate reports where information related to different warranty cases is displayed. This information should be able to be exported to Microsoft Excel.	Project sponsor	3.3	High	IT Department	

Roles and Responsibilities

The project manager and project sponsor play an important role in managing the project scope. All members must be aware that project goals are achieved and all required work is done to end the project. The following chart shows the roles and responsibilities of each project member.

Chart 8

Roles and Responsibilities

Name	Role	Responsibilities
Konny Nehring	Project Sponsor	• Approve changes in scope. • Evaluate needed changes. • Accept project deliverables.
Victor Suazo	Project Manager	• Facilitates project change requests. • Evaluates changes in scope. • Organize and facilitate schedule change control. • Communication outcomes of scope change requests.
Service Supervisors	Team Member	• Participate in change analysis
IT Department	Developers	• Validate if scope changes can be applied. • Propose scope changes.

Product Scope

To develop a warranty management system through an online platform accessible by DICOSA's staff members only, and possess a user and password. In addition, these members have authority, are part of the workshop department and are in charge of requesting, analyzing or making decision processes related to warranty claims requested by customers. The platform will possess two different interfaces and will be shown based on the level of authority that the user holds within the

process. The staff with user interface access will be able to create, save claims, access to saved claims, edit saved claims and request. On the other hand, the administrator interface users will be able to read warranty claims sent by other users, select which of the spare parts requested will be authorized and change the status of the warranty claim from pending to approved or denied.

Project Scope

Include the processes of design, develop, test, implementation, training and documentation required to execute the project.

Project Exclusions

The project does not include the activities required to update current database with information related to past sales or any activity related to fulfill blank spaces due to past mismanagement in the database. Does not include the process of development, creation, change or update of the current process of equipment reception process or development of a service platform where customer information can be stored.

Scope Verification

As the project is progressing and deliverables and requirements are being fulfilled, the project manager will compare each of the deliverables against the requirement required by the project stakeholders, as well as, the project scope defined for this project. The project manager will supervise the project execution and the accomplishment of all the activities detailed within the Work Breakdown Structure and the Work Breakdown Structure Dictionary verifying that everything meets with

all planned. The Project Manager and Project Sponsor will have a meeting for the formal acceptance for the project completion, ensuring that the project was developed under the scope defined.

Scope Management Plan, Change Process

The Scope Management Plan defined within this document can only be changed through the “Change management process” and requested by the project sponsor. Requirements must be documented and authorized by the project manager and project sponsor. If Change Request Format is not submitted, changes will not proceed and the project manager will have solely the right to refuse changes. Once the change is required and accomplished with requirements, the project sponsor will have two working days to approve or deny changes.

Work breakdown Structure

To effectively manage all the activities required to complete the project, the work breakdown structure (WBS) shows all required work to achieve the project goals. The WBS subdivides the deliverables into smaller activities to make them more manageable. **Figure 30** shows the WBS of the project.

Work Breakdown Structure Dictionary

This document should be used as a support of the Work Breakdown Structure, where information related to deliverables of the project are expressed in details. Scheduling information and responsibility for each activity can be found within this document. Chart 9 represents the WBS Dictionary.

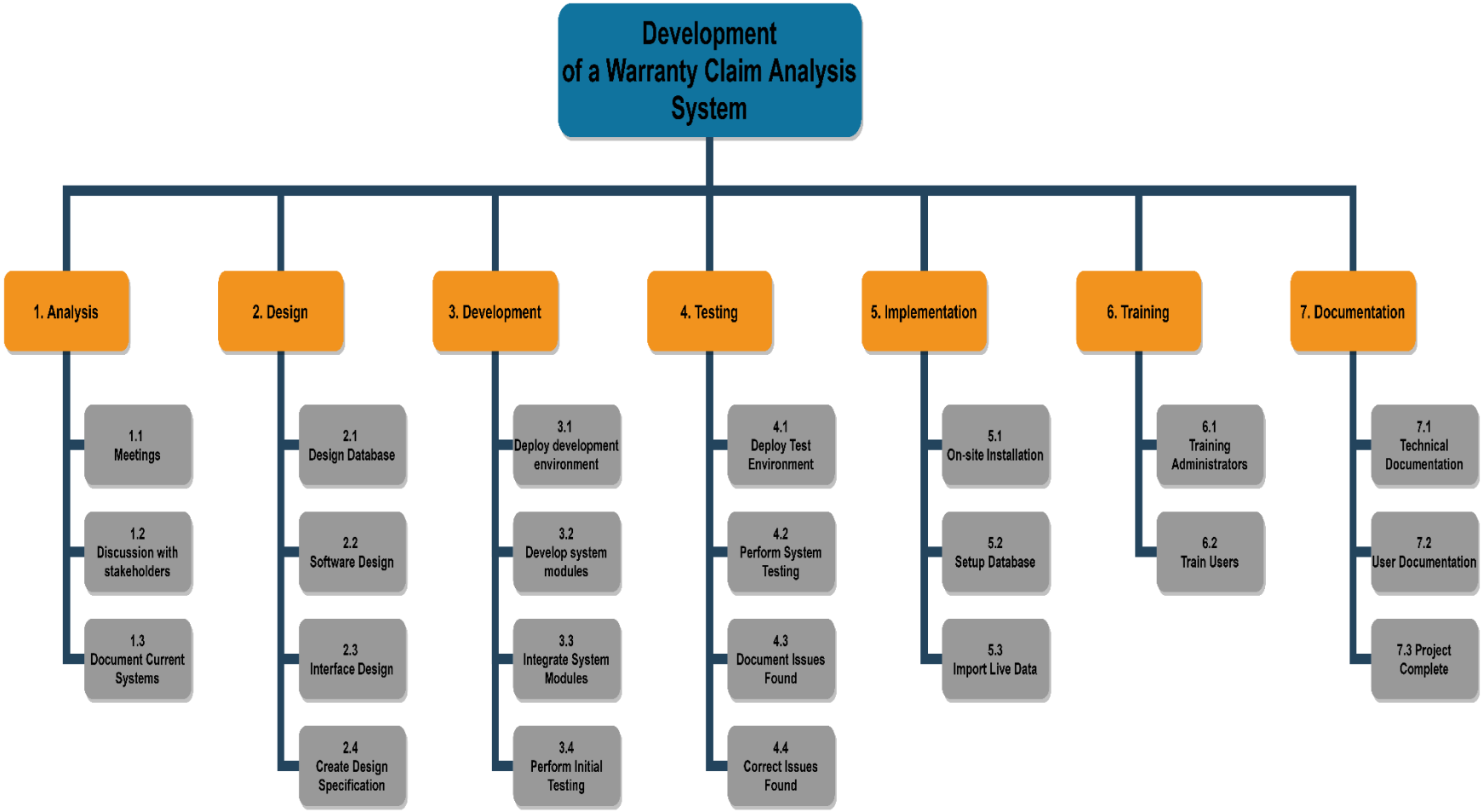
Scope Control

The project team is responsible to control the project scope using the Work Breakdown Structure Dictionary and its statements which describes needed work to complete project's deliverables. The project team ensures that the work described within the project management plan is completed and each element is achieved, overseeing the progression of the project and ensuring the project scope is completed.

Work Breakdown Structure

Figure 30

Work Breakdown Structure DWCAS Project



Work Breakdown Structure Dictionary

Chart 9

Work Breakdown Structure Dictionary

Level	WBS Code	Element Name	Description of Work	Deliverables	Resources	Budget
1	1	Analysis	Project starts where all stakeholders' requirements are listed.			
2	1.1	On-Site Meetings	Meeting the stakeholders to formalize the project.	Project Charter	Laptop Internet	
2	1.2	Discussions with stakeholders	Requirements are documented.	Requirement list. Project Scope	Laptop Internet Project Charter	
2	1.3	Document Current system	Creating and documenting business rules on department job.	Current system situation. Business Rules	Laptop Internet Microsoft Word	
1	2	Design	Description of features and operations required.			
2	2.1	Design Database	Using entity-relation diagram are created based on business rules.	Logical Diagram. Relational Diagram.	Laptop Internet Business Rules Oracle SQL data modeler SQL Server	
2	2.2	Software Design	Programming requirements.	Confirm or update resources list.	Laptop Internet Requirement list.	

Level	WBS Code	Element Name	Description of Work	Deliverables	Resources	Budget
2	2.3	Interface Design	Design of how the user and administrator interfaces will be, and different screens shown by the program accomplishing requirements	Interface design final draft.	Laptop Internet Requirement List Microsoft Word Visual Studio	
1	3	Development	Start required activities to develop the program.			
2	3.1	Deploy development environment	Start required activities to develop the system environment and programming.Choose the platforms, servers, database type and system requirements where the program will run.	Resource List update	Laptop Internet SQL Server Visual Studio	
2	3.2	Develop System Modules	Programming variety of modules that the system requires. Define profiles and roles of users.	Software Code	Laptop Internet SQL Server Visual Studio	
2	3.3	Integrate System Modules	Programming the relations and interactions within the different modules of the system	Project Documentation	Laptop Internet SQL Server Visual Studio	
2	3.4	Perform Initial Testing	Check work relations among modules.	Quality Updates.	Laptop Internet	

Level	WBS Code	Element Name	Description of Work	Deliverables	Resources	Budget
			Confirm communication with the server.		SQL Server Visual Studio	
1	4	Testing	Related activities to test the system functionality,found errors, bugs and operation.		Laptop Internet SQL Server Visual Studio	
2	4.1	Deploy Test Environment	Deploy the program within the test productivity database.	Project Documentation	Laptop Internet SQL Server Visual Studio	
2	4.2	Perform System Testing	Inspection of quality performance, validations and restrictions that assures the quality of information.	Project Documentation	Laptop Internet SQL Server Visual Studio	
2	4.3	Document Issues Found	Register all the problems or computing errors found during the system test.	Project Documentation	Laptop Internet SQL Server Visual Studio Microsoft Word	
2	4.4	Correct Issues Found	Apply changes or corrections as needed.	Software approval documentation.		
1	5	Implementation	Related activities to implement the program in operation.			
2	5.1	On-site Installation	Include platform within the current production system.		Laptop Internet SQL Server	

Level	WBS Code	Element Name	Description of Work	Deliverables	Resources	Budget
					Visual Studio	
2	5.2	Setup Database	To integrate the new database with current databases, in order to make internal consults among different entities.		Laptop Internet SQL Server Visual Studio	
1	6	Training	Activities related to formal preparation of users.			
2	6.1	To train administrator users.	Training activities needed to prepare administrative users in connection to the system operation.		Laptop Internet Computer Projector	
2	6.2	To train Users	Training activities needed to prepare users in connection to the system operation		Laptop Internet Computer Projector	
1	7	Documentation	Related activities to create manuals and documentation related to developmemnt of program.		Laptop Internet Microsoft Word	
2	7.1	Technical Documentation	To create a manual of software and database maintenance.	Software maintenance manual	Laptop Internet Microsoft Word	
2	7.2	User Documentation	To create a manual of software users.	User Manual	Laptop Internet Microsoft Word	

Level	WBS Code	Element Name	Description of Work	Deliverables	Resources	Budget
2	7.3	Project Complete	Project conclusion and closing activities.			

4.3 Project Schedule Management

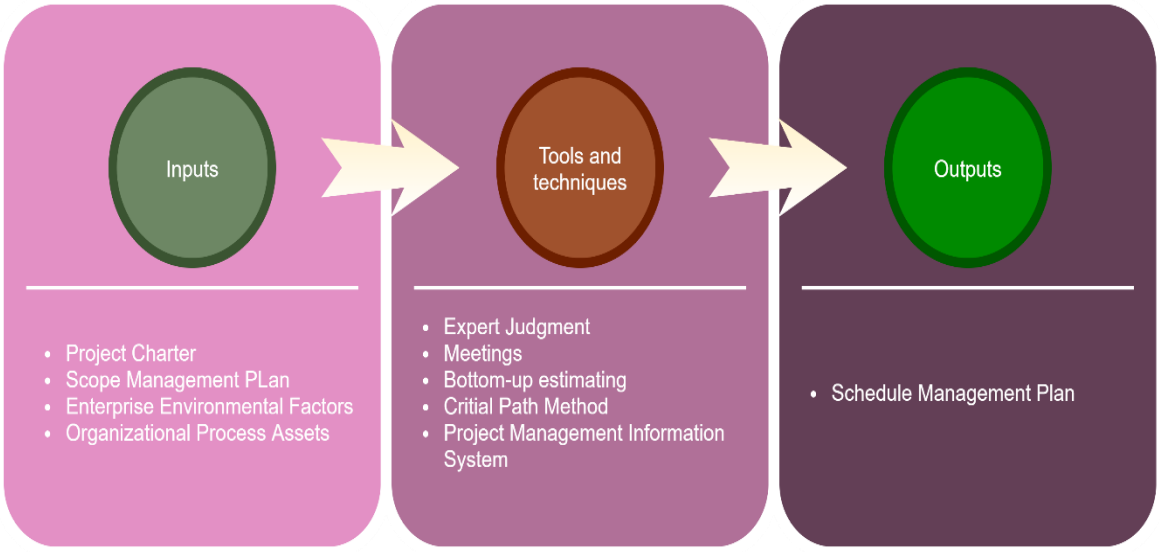
Project schedule Management Plan, was created in order to detail the processes required to manage time needed to complete the project. To develop this project management plan, it was necessary to identify all activities required to complete the project, define their sequence and relations with predecessors, making its relation with Microsoft Project and using “Finish to star” sequence, which means that some activities required finishing others, to begin working on them. Once this relation was established, the complete schedule was developed having as a result “the schedule of activities” which is represented within the Gantt Diagram shown in **Figure 32** and **Figure 33**.

This can be considered as a smaller project where most of the important activities will be executed by a person over a short period of time, so, the schedule techniques have been used to fit with the project requirements. Thus is why, it was considered to include a reserve time, that can be used to cover any contingency or special requirement of the company in case that the person in charge of this activities would be required to cover any other emergencies of the organizations.

Figure 31 shows the inputs and techniques followed to create the project schedule management plan.

Figure 31

Development of the Schedule Management Plan



Note. Adapted from: Project Management Institute, 2017, p. 179

Document Tracking (Schedule Management Plan)

General Information

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Approvals

Role	Name	Signature	Date
Project Sponsor	Konny Nehring		
Project Manager	Victor Suazo		

4.3.1 Schedule Management Plan

	**Schedule Management Plan**	
Version 1.0	Document ID: 004-DCSA-SMP	08/06/2021

Roles and Responsibilities

The project manager and project sponsor play an important role in managing the project schedule. All members must be aware that project goals' are achieved and all work required to finish the project is done within a scheduled time. Any delay in one of the activities within the schedule plan will delay the whole project delivery. The following chart shows the roles and responsibilities of each project member.

Chart 10

Roles and Responsibilities

Name	Role	Responsibilities
Konny Nehring	Project Sponsor	• Approve changes in schedule. • Evaluate changes when needed. • Accept project deliverables. • Approve each advance in the schedule plan.
Victor Suazo	Project Manager	• Facilitates the project change requests. • Request to project sponsor to approve changes in schedule. • Organize and facilitate schedule change control. • Communication outcomes of schedule change requests. • Communication of advances in the project activities.
IT Department	Developers	• Document any delay in the project activities. • Request schedule changes. • Update the calendar activities.

Duration Estimates

The time defined to complete activities, involves time required to complete individual activities within the project. Duration defined can only be changed through the change management process and approved by the project sponsor. Time duration have been set based on consultation with IT area experts which have estimated the time needed to perform the project.

Sequence of activities

The sequence of activities defines the order of execution of each activity that is needed to execute and complete the project. This process establishes the activities, duration, predecessors and important information related to how the project will be developed based on activities execution. The project life cycle fits with the System/Software Development Life Cycle (SDLC), this type of life cycle is tailored to be used to create, modify or give maintenance to software and platforms related to information technology systems. **Chart 11** shows the project activities, where task name, duration, start and finishing dates the same as activities predecessors are shown.

Gantt Diagram

Gantt Diagram is a graphical representation of the project activities where activities sequence and durations are shown as bar charts, this diagram will be used to communicate to stakeholders any advance or delay during the project execution. Project Schedule **and Critical Path**

Figure 32 and Figure 33 shows the Gantt Diagram of the project.

Project Duration

The estimated time for the development of the project is of seventy nine days, approximately.

Schedule Management Plan, Change Process

The Schedule Management Plan defined in this document can only be changed through the change management process and requested by the project sponsor. Requirements must be documented and authorized by the project manager and project sponsor. When Change Request Format is not submitted, changes will not proceed, and the project manager will have solely the right to refuse changes. Once, the change is required and fulfills requirements, the project sponsor will have two working days to approve or deny changes. Any change request should be documented and its approval depends on the priority and how its approval or denial can affect the project completion.

Project Activities

Chart 11

Project Activities

WBS	Task Name	Duration	Start	Finish	Predecessors
0	Development of a Warranty Claim Analysis System	79 days	08/03/2021	11/19/2021	
1	1. Analysis	6 days	08/03/2021	08/10/2021	
1.1	1.1 On-Site Meetings	1 day	08/03/2021	08/03/2021	
1.2	1.2 Discussions with Stakeholders	2 days	08/06/2021	08/09/2021	3FS+2 days

WBS	Task Name	Duration	Start	Finish	Predecessors
1.3	1.3 Document Current Systems	1 day	08/10/2021	08/10/2021	4
2	2. Design	11 days	09/01/2021	09/15/2021	
2.1	2.1 Design Database	4 days	09/01/2021	09/06/2021	4
2.2	2.2 Software Design	5 days	09/07/2021	09/13/2021	7
2.3	2.3 Interface Design	2 days	09/14/2021	09/15/2021	8
3	3. Development	22 days	09/16/2021	10/15/2021	
3.1	3.1 Deploy Development Environment	1 day	09/16/2021	09/16/2021	6
3.2	3.2 Develop System Modules	11 days	09/17/2021	10/01/2021	11
3.3	3.3 Integrate System Modules	7 days	10/04/2021	10/12/2021	12
3.4	3.4 Perform Initial Testing	3 days	10/13/2021	10/15/2021	13
4	4. Testing	12 days	10/09/2021	11/03/2021	
4.1	4.1 Deploy Test Environment	1 day	10/19/2021	10/19/2021	14FS+1 day
4.2	4.2 Perform System Testing	2 days	10/20/2021	10/21/2021	16
4.3	4.3 Document Issues Found	6 days	10/22/2021	10/29/2021	17
4.4	4.4 Correct Issues Found	3 days	11/01/2021	11/03/2021	18
5	5. Implementation	2 days	11/04/2021	11/05/2021	19
5.1	5.1 On-Site Installation	1 day	11/04/2021	11/04/2021	
5.2	5.2 Setup Database	1 day	11/05/2021	11/05/2021	21
6	6. Training	6 days	11/08/2021	11/15/2021	20
6.1	6.1 Train Administrators	3 days	11/08/2021	11/10/2021	
6.2	6.2 Train Users	3 days	11/11/2021	11/15/2021	24
7	7. Documentation	4 days	11/16/2021	11/19/2021	23
7.1	7.1 Technical Documentation	3 days	11/16/2021	11/18/2021	25
7.2	7.2 User Documentation	3 days	11/16/2021	11/18/2021	25
7.3	7.3 Project Complete	1 day	11/19/2021	11/19/2021	28

Critical Path

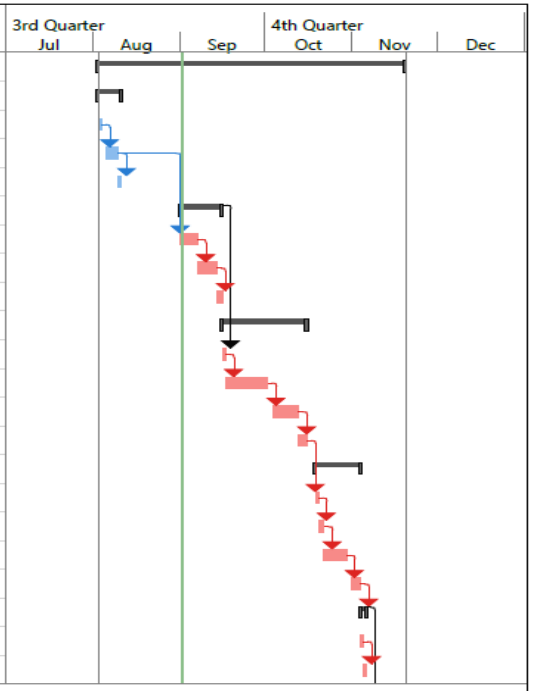
The Gantt diagram is a bar chart that shows listed activities on the vertical axis, and its dates on the horizontal axis, showing an easy representation of durations and the sequence of activities presented graphically, and making more understandable the analysis of the activities and its presentation when communicating project to stakeholders. Within the same graph (Gantt chart) the critical path can be shown, this path is used to estimate the minimum project duration, determining the schedule flexibility and showing those activities where delays can affect the whole project development. As it can be seen, in Figure 32 and Figure 33, the critical activities which are part of the critical path are colored in red. The variance on this path will represent a direct impact on the project's end date, being possible that the estimated deadline can change, so, focusing attention to these activities, is crucial for project completion within the estimated schedule.

Project Schedule and Critical Path

Figure 32

Gantt Diagram page 1

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Development of a Warranty Claim Analysis Syste**	**79 days**	**Tue 03/08/21**	**Fri 19/11/21**	
2	**1. Analysis**	**6 days**	**Tue 03/08/21**	**Tue 10/08/21**	
3	1.1 On-Site Meetings	1 day	Tue 03/08/21	Tue 03/08/21	
4	1.2 Discussions with Stakeholders	2 days	Fri 06/08/21	Mon 09/08/21	3FS+2 days
5	1.3 Document Current Systems	1 day	Tue 10/08/21	Tue 10/08/21	4
6	**2. Design**	**11 days**	**Wed 01/09/21**	**Wed 15/09/21**	
7	2.1 Design Database	4 days	Wed 01/09/21	Mon 06/09/21	4
8	2.2 Software Design	5 days	Tue 07/09/21	Mon 13/09/21	7
9	2.3 Interface Design	2 days	Tue 14/09/21	Wed 15/09/21	8
10	**3. Development**	**22 days**	**Thu 16/09/21**	**Fri 15/10/21**	
11	3.1 Deploy Development Environment	1 day	Thu 16/09/21	Thu 16/09/21	6
12	3.2 Develop System Modules	11 days	Fri 17/09/21	Fri 01/10/21	11
13	3.3 Integrate System Modules	7 days	Mon 04/10/21	Tue 12/10/21	12
14	3.4 Perform Initial Testing	3 days	Wed 13/10/21	Fri 15/10/21	13
15	**4. Testing**	**12 days**	**Tue 19/10/21**	**Wed 03/11/21**	
16	4.1 Deploy Test Environment	1 day	Tue 19/10/21	Tue 19/10/21	14FS+1 day
17	4.2 Perform System Testing	2 days	Wed 20/10/21	Thu 21/10/21	16
18	4.3 Document Issues Found	6 days	Fri 22/10/21	Fri 29/10/21	17
19	4.4 Correct Issues Found	3 days	Mon 01/11/21	Wed 03/11/21	18
20	**5. Implementation**	**2 days**	**Thu 04/11/21**	**Fri 05/11/21**	19
21	5.1 On-Site Installation	1 day	Thu 04/11/21	Thu 04/11/21	
22	5.2 Setup Database	1 day	Fri 05/11/21	Fri 05/11/21	21



Project: Programa
Date: Thu 02/09/21

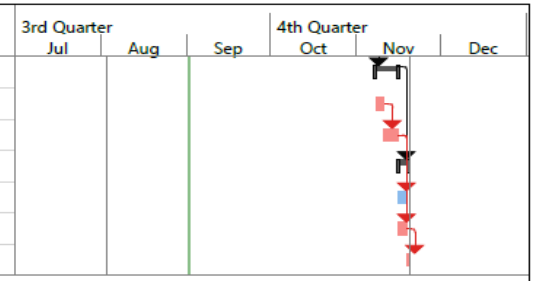
Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Critical
Project Summary	Manual Summary	Critical Split
Inactive Task	Start-only	Progress
Inactive Milestone	Finish-only	Manual Progress

Page 1

Figure 33

Gantt Diagram page 2

ID	Task Name	Duration	Start	Finish	Predecessors
23	**6. Training**	**6 days**	**Mon 08/11/21**	**Mon 15/11/21**	20
24	6.1 Train Administrators	3 days	Mon 08/11/21	Wed 10/11/21	
25	6.2 Train Users	3 days	Thu 11/11/21	Mon 15/11/21	24
26	**7. Documentation**	**4 days**	**Tue 16/11/21**	**Fri 19/11/21**	23
27	7.1 Technical Documentation	3 days	Tue 16/11/21	Thu 18/11/21	25
28	7.2 User Documentation	3 days	Tue 16/11/21	Thu 18/11/21	25
29	7.3 Project Complete	1 day	Fri 19/11/21	Fri 19/11/21	28



Project: Programa
Date: Thu 02/09/21

Task		Inactive Summary		External Tasks	
Split		Manual Task		External Milestone	
Milestone		Duration-only		Deadline	
Summary		Manual Summary Rollup		Critical	
Project Summary		Manual Summary		Critical Split	
Inactive Task		Start-only		Progress	
Inactive Milestone		Finish-only		Manual Progress	

Page 2

Schedule Control

Once the project has started, the project members and people involved in each activity, they must report to the project manager once the activities have started and finished. Any delay in accomplishing with the ending date will require a written change request, from the member responsible for the activity, including corrective actions that will be taken to achieve the project's schedule which must be in line with the work breakdown structure.

Using the approved communications channels, the project sponsor will be able to monitor the current project status through an updated version of Gantt diagram.

The project manager and its team will do the following activities to ensure that the project development is within the boundaries of the project schedule baseline.

1. Determine the current status of activities
2. Analyze and influence factors that could cause schedule changes
3. Identify if the schedule has changed to report to project's sponsors.
4. Manage changes if they occur.

Reserve Analysis

Due to high chances of changing schedule of the person who is responsible for the project execution, and the possibility of requiring to procure equipment, it was considered to extend two weeks to be able to handle any contingency as a management reserve. This time, can be used, reduced or eliminated, according to the project advances. Any change on schedule must be requested using the changing management process.

Reserve Assignation

Chart 12

Reserve Analysis Assignation

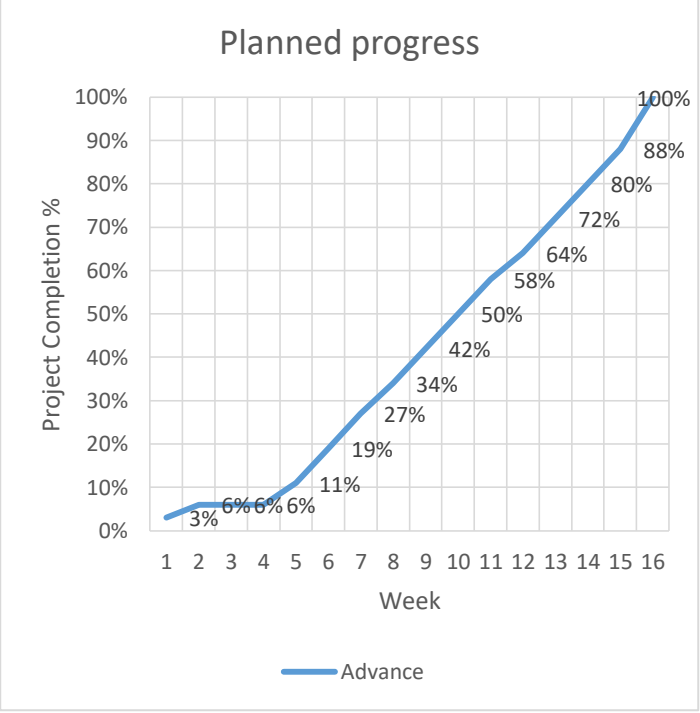
WBS	Description	Duration	Extra Time	Total
3.2	Develop System Modules	6 Days	+5 Days	11 Days
3.3	Integrate System Modules	4 Days	+3 Days	7 Days
6.1 6.2	Train Administrators Train Users	1 Day	+2 Days	3 Days

Planned Progress

Chart 13

Project Planned Progress

Week	Date	Planned Status
1	06/08/2021	3%
2	13/08/2021	6%
3	20/08/2021	6%
4	27/08/2021	6%
5	03/09/2021	11%
6	10/09/2021	19%
7	17/09/2021	27%
8	24/09/2021	34%
9	01/10/2021	42%
10	08/10/2021	50%
11	15/10/2021	58%
12	22/10/2021	64%
13	29/10/2021	72%
14	05/11/2021	80%
15	12/11/2021	88%
16	19/11/2021	100%



Project updates and activities related to project development, will be reported weekly, using the “weekly report” that can be seen in Appendix 6, and using the

following graph of the planned activities will be contrasted against real advances of the project. Chart 13, shows the planned progress along the developed weeks of the project.

Critical Tasks

The critical tasks report shows those activities where there is no room in the schedule to slip. This report was generated using MS Project.

Chart 14

Project Critical Tasks

Name	Start	Finish	%Complete	Resources
2.1 Design Database	Wed 09/01/21	Mon 09/06/21	0%	Laptop Internet Business Rules Oracle SQL data modeler SQL Server
2.2 Software Design	Tue 09/07/21	Mon 09/13/21	0%	Laptop Internet Requirement list.
2.3 Interface Design	Tue 09/14/21	Wed 09/15/21	0%	Laptop Internet Requirement List Microsoft Word Visual Studio
3.1 Deploy Development Environment	Thu 09/16/21	Thu 09/16/21	0%	Laptop Internet SQL Server Visual Studio
3.2 Develop System Modules	Fri 09/17/21	Fri 10/01/21	0%	Laptop Internet SQL Server Visual Studio
3.3 Integrate System Modules	Mon 10/04/21	Tue 10/12/21	0%	Laptop Internet SQL Server

Name	Start	Finish	%Complete	Resources
				Visual Studio
3.4 Perform Initial Testing	Wed 10/13/21	Fri 10/15/21	0%	Laptop Internet SQL Server Visual Studio
4.1 Deploy Test Environment	Tue 10/19/21	Tue 10/19/21	0%	Laptop Internet SQL Server Visual Studio
4.2 Perform System Testing	Wed 10/20/21	Thu 10/21/21	0%	Laptop Internet SQL Server Visual Studio
4.3 Document Issues Found	Fri 10/22/21	Fri 10/29/21	0%	Laptop Internet SQL Server Visual Studio Microsoft Word
4.4 Correct Issues Found	Mon 11/01/21	Wed 11/03/21	0%	
5.1 On-Site Installation	Thu 11/04/21	Thu 11/04/21	0%	Laptop Internet SQL Server Visual Studio
5.2 Setup Database	Fri 11/05/21	Fri 11/05/21	0%	Laptop Internet SQL Server Visual Studio
6.1 Train Administrators	Mon 11/08/21	Wed 11/10/21	0%	Laptop Internet Computer Projector
6.2 Train Users	Thu 11/11/21	Mon 11/15/21	0%	Laptop Internet Computer Projector
7.2 User Documentation	Tue 11/16/21	Thu 11/18/21	0%	Laptop Internet Microsoft Word

4.4 Project Cost Management

The project's cost management plan, includes the process involved to detail all needed activities to manage and control the project cost. The nature of the project and the project sponsor requirements, required that the project must be completed using current information, software, hardware and staff of the company to avoid extra expenses related to project development.

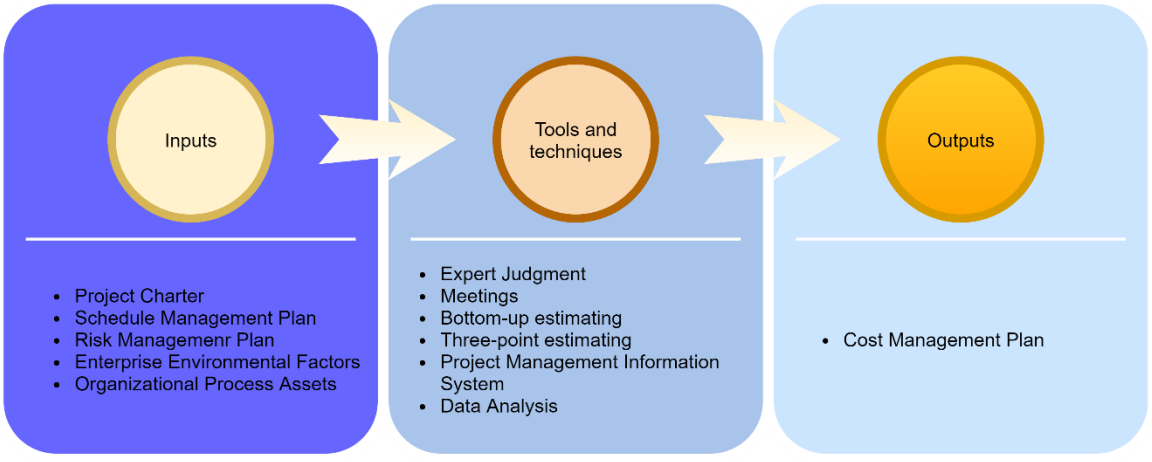
To fulfill the stakeholders' requirement, it was necessary to consider the free license software to develop the project, which does not demand any special requirements to be used, nevertheless, it can be used to design, develop and launch the warranty system.

The cost management plan, it determines that in case of any additional cost, should be done through the Change Management Process and it can be only authorized by the project sponsor.

Figure 34, shows the process to develop the Cost Management Plan.

Figure 34

Development of the Cost Management Plan



Note. Adapted from: Project Management Institute, 2017, p. 235

Document Tracking (*Cost Management Plan*)

General Information

	Information
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Approvals

Role	Name	Signature	Date
Project Sponsor	Konny Nehring		
Project Manager	Victor Suazo		

4.4.1 Cost Management Plan

	**Cost Management Plan**	
Version 1.0	Document ID: 005-DCSA-CMP	08/06/2021

Project Cost

Due to all activities, related to each of the project phases, from planning to closing, will be covered with company's current resources. The project does not require any extra budget for its execution. In order to avoid this overwhelming expenses, thus management plan defines the expected cost based on the salaries of the people involved in the project development.

Project Cost Estimation

This process involves activities, required to develop and calculate the budget needed for the project execution. This quantitative assessment includes the cost for each project's activity defined within the project Work Breakdown Structure. It was used the bottom-up estimation, to calculate the cost related to the project packages and its activities, in the lowest levels of the WBS, and concluding with the total addition of the estimated project´s whole cost. The cost estimation is obtained by using the Three Point Estimating, which is a method of approximation range for an activity cost using the three following scenarios:

Most Likely (cM): This cost is obtained through realistic effort, as for time, required to succeed the project, and the average salary of an IT Engineer which is USD $850 per month.

Optimistic (cO): This is the best scenario for the activity, since a lower salary range of USD $700, per month, is used.

Pessimistic (cP): This is the worst-case scenario because of the highest salary range of an IT Engineer, $1100 per month.

As the cost is defined, in each scenario, the expect cost (cE) is obtained by using a beta distribution formula:

$$cE = \frac{cO + 4 \cdot cM + cP}{6}$$

A programmer analyst gets monthly payment based on a well-known job placement company, in Honduras (Tecoloco Honduras Blog, 2019). As per law (Corte Suprema de Justicia, 1959, p. 83), this company considers eight working hours, per day, and maximum of 192 hours per month. **Chart 15**, shows the cost per hour based on the Most Likely, Optimistic and Pessimistic Scenarios.

Chart 15

Cost Scenarios

Scenario	Monthly Salary	Hours Per Month	Cost per hour
Most Likely	$850	192 hr.	$4.43
Optimistic	$700	192 hr.	$3.65
Pessimistic	$1100	192 hr.	$5.73
Expected	**$866.67**	**192 hr.**	**$4.51**

$$cE = \frac{cO + 4 \cdot cM + cP}{6} = \frac{3.65 + 4 \cdot 4.43 + 5.73}{6} = \$4.51$$

Cost Estimate

Chart 16

Cost Estimate

WBS	Task Name	Duration	Most Likely	Optimistic	Pessimistic	Expected Cost
0	**Development of a Warranty Claim Analysis System**	**69 days**	**$1,629.17**	**$1,341.67**	**$2,108.33**	**$1,661.11**
1	**1. Analysis**	**6 days**	**$0**	**$0**	**$0**	**$0**
1.1	1.1 On-Site Meetings	1 day	$0	$0	$0	$0
1.2	1.2 Discussions with Stakeholders	2 days	$0	$0	$0	$0
1.3	1.3 Document Current Systems	1 day	$0	$0	$0	$0
2	**2. Design**	**11 days**	**$389.58**	**$320.83**	**$504.17**	**$397.22**
2.1	2.1 Design Database	4 days	$141.67	$116.67	$183.33	$144.44
2.2	2.2 Software Design	5 days	$177.08	$145.83	$229.17	$180.56
2.3	2.3 Interface Design	2 days	$70.83	$58.33	$91.67	$72.22
3	**3. Development**	**14 days**	**$495.83**	**$408.33**	**$641.67**	**$505.56**
3.1	3.1 Deploy Development Environment	1 day	$35.42	$29.17	$45.83	$36.11
3.2	3.2 Develop System Modules	6 days	$212.50	$175.00	$275.00	$216.67
3.3	3.3 Integrate System Modules	4 days	$141.67	$116.67	$183.33	$144.44
3.4	3.4 Perform Initial Testing	3 days	$106.25	$87.50	$137.50	$108.33
4	**4. Testing**	**12 days**	**$425.00**	**$350.00**	**$550.00**	**$433.33**
4.1	4.1 Deploy Test Environment	1 day	$35.42	$29.17	$45.83	$36.11
4.2	4.2 Perform System Testing	2 days	$70.83	$58.33	$91.67	$72.22
4.3	4.3 Document Issues Found	6 days	$212.50	$175.00	$275.00	$216.67
4.4	4.4 Correct Issues Found	3 days	$106.25	$87.50	$137.50	$108.33
5	**5. Implementation**	**2 days**	**$70.83**	**$58.33**	**$91.67**	**$72.22**
5.1	5.1 On-Site Installation	1 day	$35.42	$29.17	$45.83	$36.11
5.2	5.2 Setup Database	1 day	$35.42	$29.17	$45.83	$36.11

WBS	Task Name	Duration	Most Likely	Optimistic	Pessimistic	Expected Cost
6	**6. Training**	**4 days**	**$141.67**	**$116.67**	**$183.33**	**$144.44**
6.1	6.1 Train Administrators	2 days	$70.83	$58.33	$91.67	$72.22
6.2	6.2 Train Users	2 days	$70.83	$58.33	$91.67	$72.22
7	**7. Documentation**	**4 days**	**$106.25**	**$87.50**	**$137.50**	**$108.33**
7.1	7.1 Technical Documentation	3 days	$106.25	$87.50	$137.50	$108.33
7.2	7.2 User Documentation	3 days	$0	$0	$0	$0
7.3	7.3 Project Complete	1 day	$0	$0	$0	$0

Contingency Reserve Cost Analysis

The contingency reserve is the budget amount determined to cover all the uncertain costs that may appear as the project advances. **Chart 17** shows calculation of the contingency reserve of it. And calculation is based on the contingency schedule reserve, shown in **Chart 12** to cover known-unknowns that might affect the project. As for instance, rework or chances of not being able to work in the project due to urgencies or others given assignments to the IT Developer.

Chart 17

Contingency Reserve

WBS	Description	Duration	Extra Time	Most Likely	Optimistic	Pessimistic	Expected Cost
3.2	Develop System Modules	6 Days	+5 Days	$177.08	$145.83	$229.17	$180.56
3.3	Integrate System Modules	4 Days	+3 Days	$106.25	$87.50	$137.50	$108.33
6.1	Train Administrators	2 Day	+1 Days	$35.42	$29.17	$45.83	$36.11
6.2	Train Users	2 Day	+1 Days	$35.42	$29.17	$45.83	$36.11
Total			**+10 Days**	**$354.17**	**$291.67**	**$458.33**	**$361.11**

Management reserve

The management reserve is the budget within the cost baseline to respond to any delay or unforeseen work within the project scope, when in this case is equal to 10% over the estimated project´s cost.

$$Management\ Reserve = cE \cdot 10\% = \$1661.11 \cdot 10\% = \$166.11$$

Project's Budget.

The cost related to the project's development is shown in **Chart 18**

Chart 18

Project Costs

Development of a Warranty Claim Analysis System	
Analysis	$0
Design	$397.22
Development	$505.56
Testing	$433.33
Implementation	$72.22
Training	$144.44
Documentation	$108.33
Material and other Resources	$0
Cost Estimate	**$1661.10**
Contingency Reserve	$361.11
Cost Baseline	**$2022.21**
Management Reserve	$166.11
Total Project Budget	**$2188.32**

Cost Control Process

Due to the importance of achieving the project development within an established, following the boundaries and the salary defined for the project staff, the project manager and project sponsor will follow and assess the activities, on completion within the estimates dated and defined in this plan. In order to have a precise estimation of the completion of each activity, maintaining the cost within the budget,

the Earned Value Analysis will be used in order to measure the project's schedule completion and the cost related to it. As a result it is necessary to consider the following terms:

- **Planned Value (PV):** The authorized budget assigned to complete the activities
- **Earned Value (EV)**: Measure of work performed expressed in terms of the budget authorized.

  Actual Cost (AC): The current cost of job performance during a period of specific time.

  (Project Management Institute, 2017, p. 261)

To obtain these values and make the Earned Value Analysis is necessary to use formulas, as for instance the Schedule Variance, Cost Variance, Earned Value and indeed, by following indicators such as Schedule Performance Index and Cost Performance Index, which will be monitored using the **Chart 19** which Contrast cost expenses over the time, as they are calculated, below, using the formulas:

$$Schedule\ Variance = SV = EV - PV$$

$$Cost\ Variance = CV = EV - AC$$

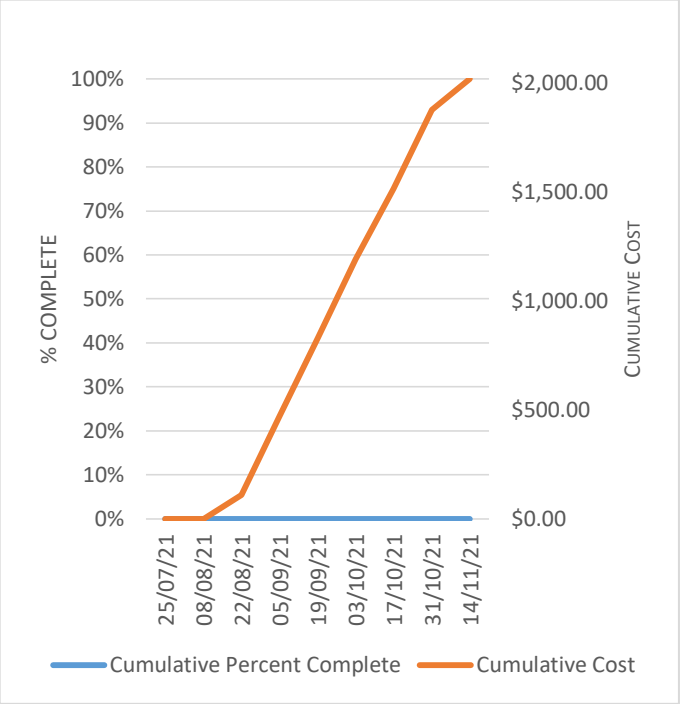
$$Schedule\ Performance\ Index = SPI = \frac{EV}{PV}$$

$$Cost\ Performance\ Index = CPI = \frac{EV}{AC}$$

Chart 19

Planned Value

Week	Date	Planned Value
1	06/08/2021	$0
2	13/08/2021	$0
3	20/08/2021	$0
4	27/08/2021	$0
5	03/09/2021	$108.33
6	10/09/2021	$288.89
7	17/09/2021	$469.08
8	24/09/2021	$651.81
9	01/10/2021	$830.56
10	08/10/2021	$1,010.03
11	15/10/2021	$1,191.67
12	22/10/2021	$1,336.83
13	29/10/2021	$1,516.67
14	05/11/2021	$1,697.22
15	12/11/2021	$1,878.14
16	19/11/2021	$2,022.22



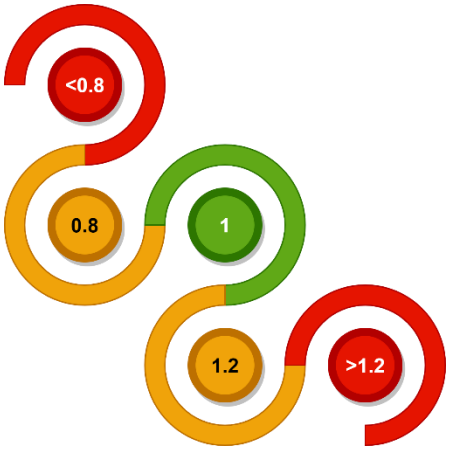
Performance Index Response

Based on results from Schedule Performance Index and Cost Performance Index, the project manager will be able to determine the current status of the project and generate contingency plans, if needed. Conveying on need of changing request and corrective activities, as per schedule and cost, considering SPI and CPI shown in Chart 20.

Chart 20

Project SPI/CPI Monitoring

Indicator	SPI/CPI Value
Green	Value equal 1
Yellow	Values between 0.8 and 1 or values between 1 and 1.2
Red	Values below 0.8 or above 1.2



Cost Management Plan, Change Process

The Cost Management Plan defined in this document can only be changed through the change management process and requested by the project sponsor. Requirements must be documented and authorized by the project manager and project sponsor. When Change Request Format is not submitted, changes will not proceed, and the project manager will have solely the right to refuse changes. Once, the change is required and fulfills requirements, the project sponsor will have two working days to approve or deny changes. Any change request should be documented and its approval depends on the priority and how its approval or denial can affect the project completion.

Roles and Responsibilities

Chart 21

Cost Roles and Responsibilities

Name	Role	Responsibilities
Konny Nehring	Project Sponsor	• Approves any cost addition.
Victor Suazo	Project Manager	• Makes sure that the project gets done on schedule, and activities in regard to plan.
IT Department	Developers	• To develop the project with current company resources.

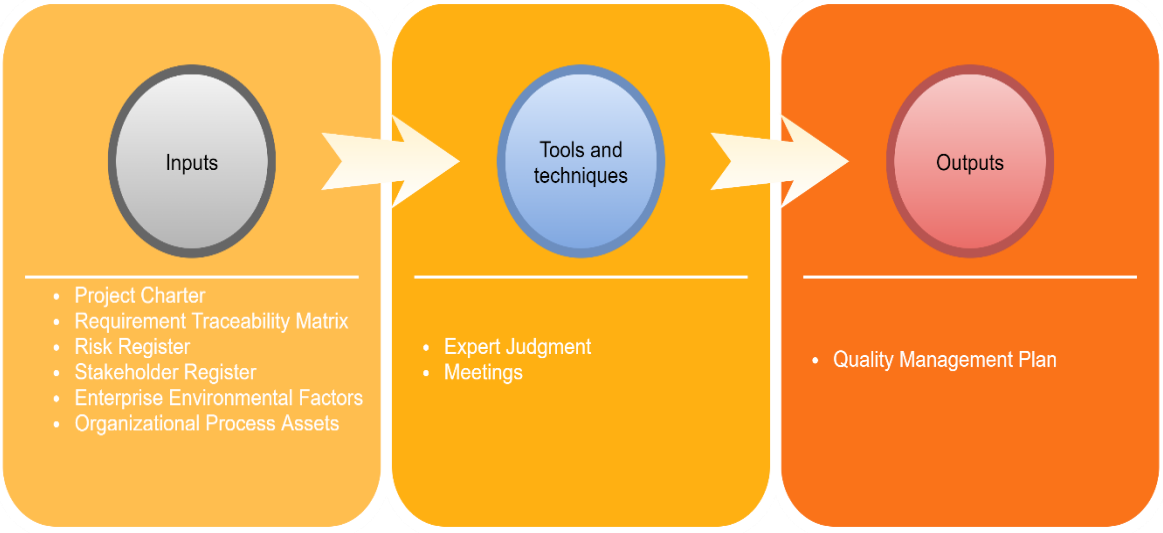
4.5 Project Quality Management

To satisfy the stakeholder´s requirement and the project´s goals, quality is incorporated within the project development. The Quality Management Plan includes the quality requirements and what are the acceptable criteria of those requirements and project deliverables to demonstrate compliance with it. This plan includes a document to assess all the project´s requirements through the Quality Control Template by defining fitting with expected standard and functionality.

The inputs and outputs required to develop the Quality Management Plan are shown in **Figure 35**.

Figure 35

Development of the Quality Management Plan



Note. Adapted from: Project Management Institute, 2017, p. 277

Document Tracking (*Cost Management Plan*)

General Information

	Information
Document Id	006-DCSA-QMP
Document Owner	Distribuidora Comercial S.A.
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Last Saved Date	August 06,2021
File Name	Quality Management Plan

Change Control

Version	**Issue Date**	**Changes**
1.0	August 06,2021	Release

Approvals

Role	**Name**	**Signature**	**Date**
Project Sponsor	Konny Nehring		
Project Manager	Victor Suazo		

4.5.1 Quality Management Plan

	**Quality Management Plan**	
Version 1.0	Document ID: 006-DCSA-QMP	08/06/2021

Project Quality

It refers to the accomplishment of all the characteristics and requirements established by the project sponsor and other stakeholders that were defined within the project charter and are listed in **Chart 7**.

Quality Metrics

For the development of the project, it is necessary to weekly measure of Cost Performance Index and Schedule Performance Indexes, reported to project sponsor during the weekly meeting and using the Appendix 6: Weekly Report. More information about project's indicators can be found within ***Chart 20*** and the expected indicators are shown in **Chart 22**

Chart 22

Quality Metrics

Metrics	Indicator
CPI	0.9<X<1.1
SPI	0.9<X<1.1
Change Request Attention	<=2 days
Project Satisfaction	>98%
CV	>=0
SV	>=0

Chart 24, describes the project requirements and acceptable criteria that the project manager must inspect, confirming its achievement using the Appendix 8 on assessing project deliverables and helping to confirm whether stakeholders' requirements are fulfilled.

Roles and Responsibilities

Chart 23

Quality Roles and Responsibilities

Name	Role	Responsibilities
Konny Nehring	Project Sponsor	• Approved quality changes • Accept project's deliverables
Victor Suazo	Project Manager	• Oversight the Quality Management Plan. • Ensures quality control. • Ensures that project requirements are fulfilled. • Schedule meeting for testing processes.
IT Department	Developers	• Handle process to ensure quality • Ensures the platform requirements are followed. • Makes sure that each SDLC phase is complete. • Register that all requirements were fulfilled.

Quality Management plan, Change Process

The Quality Management Plan defined in this document, can only be changed through the change management process and requested by the project sponsor. Requirements must be documented and authorized by the project manager and project sponsor. When Change Request Format is not submitted, changes will not proceed, and the project manager will have solely the right to refuse changes. Once,

the change is required and fulfills requirements, the project sponsor will have two working days to approve or deny changes. Any change request should be documented and its approval depends on the priority and how its approval or denial can affect the project completion.

Quality Control

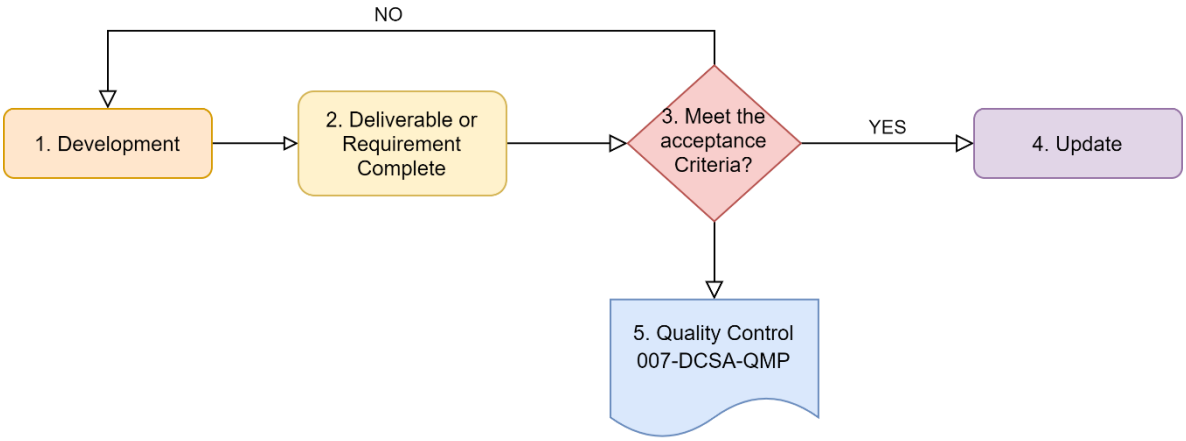
To ensure that quality is controlled, the project's team must use the following template to audit each requirement, verifying attaining with acceptable criteria, defined in Chart 24. The Quality Control must carry out to assess each of the requirements once the project deliverables or requirements have been completed. Quality Control documents can be found in the Appendix 8, and must be filled by the project manager.

Quality Control Process

1. Project deliverables are being developed.
2. Once each deliverable or requirement is categorized as completed and reported to the project Manager.
3. If the deliverable or requirement reported meets the acceptance criteria defined in **Chart 24**, the deliverable is accepted. In contrast, it will send it back to get corrected.
4. Update the project progress.
5. Each requirement or deliverable assessment must be recorded using the Quality Control 007-DCSA-QMP that can be found within the Appendix 8: Quality Control

Figure 36

Quality Assessment Process



Quality Acceptable Criteria's

Chart 24

Quality Acceptable Criteria

Project Name:	Development of a Warranty, Claim Analysis System
Project Objective:	To create a warranty management system that can be used to analyse, approve, deny and record warranty claims from customers.

ID	Requirement Description	Requested by	Responsible	Acceptable Criteria	Additional Comments
1	Warranty platform that can be accessed through internet browsers.	Project sponsor	IT Department	The user can access the platform using Chrome browser.	
2	Access will be personalized and it requires the user's and password.	Project sponsor	IT Department	Each user will have a username and password encrypted.	
3	DICOSA's IT department will have full control of the database and program setup.	Project sponsor	IT Department	The IT department can insert, modify and perform maintenance to the database and software.	
4	Information inserted within the warranty request should be stored in the server.	Project sponsor	IT Department	The information must be accessible any time.	
5	Warranty claims can be created only for those equipment who have a repair order with open status.	Project sponsor	IT Department	Warranty Claims are related to an Open work order and cannot be created without it.	

ID	Requirement Description	Requested by	Responsible	Acceptable Criteria	Additional Comments
6	Following information should be recorded: Call ID (Repair Order), Customer complaint, Technician Diagnosis, Technical Solution, Spare parts needed to fix the problem, other resources as materials or chemicals used, Labor time, Repair Date, Claim Serial, Comments,Technician ID	Project sponsor	IT Department	Information contained within the warranty claim.	
7	Evidence that supports the warranty claim must be submitted, file format accepted: PNG, JPG, JPEG, PDF, MP4 or any other media file.	Project sponsor	IT Department	The platform permits attaching files with the required format.	
8	The user should be able to categorize the evidence among these types: Repair Order, Serial Number, Defect evidence, others.	Project sponsor	IT Department	The platform permits the user to select what kind of file has been attached.	
9	The platform should be able to consult information about the current database, customer's information and equipment information.	Project sponsor	IT Department	Information integrity, the information shown in the user interface matches with other information displayed in other databases.	

ID	Requirement Description	Requested by	Responsible	Acceptable Criteria	Additional Comments
10	The platform should send an email to notify the creation and status change to service staff involved in the process.	Project sponsor	IT Department	Email is received by users once the warranty is created and when a final status has been assigned.	
11	Each case can be approved or denied, or remains in pending status.	Project sponsor	IT Department	The platform permits the administrator user to select between the different resolutions of each case.	
12	To maintain reliability of information, once the warranty was sent, the user is not able to modify information.	Project sponsor	IT Department	The user cannot modify the warranty claim once it was sent to analysis.	
13	The platform will assign an ID number, which is composed by an integer number starting from the number 1.	Project sponsor	IT Department	Unique ID number assigned to each warranty case.	
14	The platform will have two different interfaces: • **User interface**: where warranty claims are created. **Administrative interface**: where warranty claims are received, analyzed and approved or denied.	Project sponsor	IT Department	Friendly platform interface. Two different interfaces with unique privileges depending on the type of user.	

ID	Requirement Description	Requested by	Responsible	Acceptable Criteria	Additional Comments
15	The administrator interface must contain an option to generate reports where information related to different warranty cases is displayed. This information should be able to be exported to Microsoft Excel.	Project sponsor	IT Department	Automatic report function, is available.	

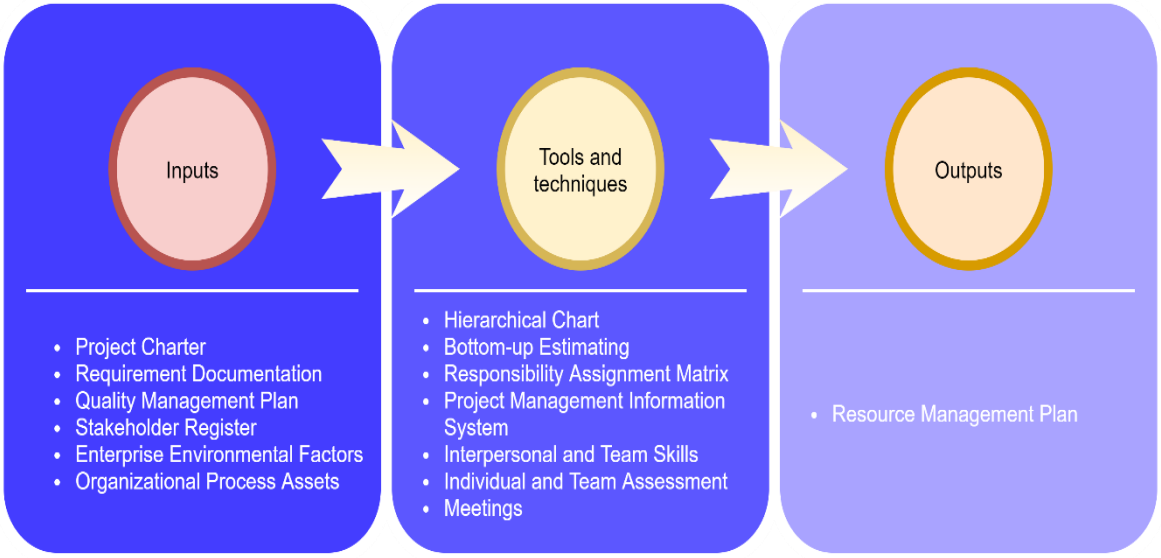
4.6 Project Resource Management

The sixth specific objective, is to create the resource management plan to ensure that all the necessary staff and assets are managed effectively on schedule, budget and scope baselines planned. This plan has been tailored to use current resources from the company and includes staff, training requirements and staff release, once the project has finished.

The Resource Management Plan process is detailed in **Figure 37**, where inputs, techniques and outputs required to develop the plan.

Figure 37

Resource Management Plan Development Process



Note. Adapted from: Project Management Institute, 2017, p. 312

Document Tracking (Resource Management Plan)

General Information

	Information
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Change Control

Version	Issue Date	Changes
1.0	August 07,2021	Release

Approvals

Role	Name	Signature	Date
Project Sponsor	Konny Nehring		
Project Manager	Victor Suazo		

4.6.1 Resource Management Plan

DCOSA DISTRIBUIDORA COMERCIAL S.A.	**Resource Management Plan**	
Version 1.0	Document ID: 008-DCSA-RMP	08/07/2021

Project Resources

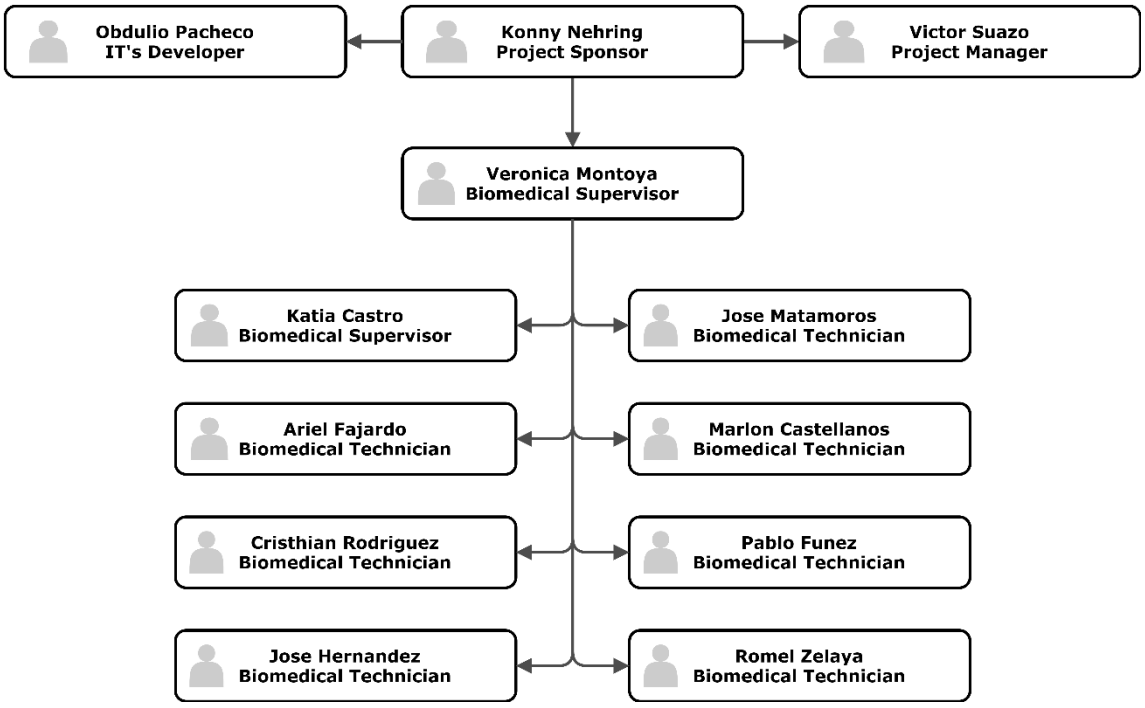
It refers to all resources needed to achieve the project aims.

Project Team

The following figure represents the roles of the staff that can be found in the project, it also establishes the line of authority within the project and how communication will be done.

Figure 38

Project Team



Activity Resources Estimation

This process quantifies team resources, material equipment and supplies needed to perform the project. The resource estimation is made using the Bottom-Up estimating listed in Chart 9, in combination with Microsoft Project, where resources were added to each work package and generating an automatic report, that delivers the amount of hours needed of each of the resources described on it, and dates where the resource should be available to be used. This information can be seen in Chart 25.

Resources Breakdown Structure

This hierarchical representation categorizes each of the resources needed to develop the project, including team, software, equipment, documents and services during the project's life cycle. Figure 39 shows the Resource Breakdown structure of the Project.

Figure 39

Resource Breakdown Structure

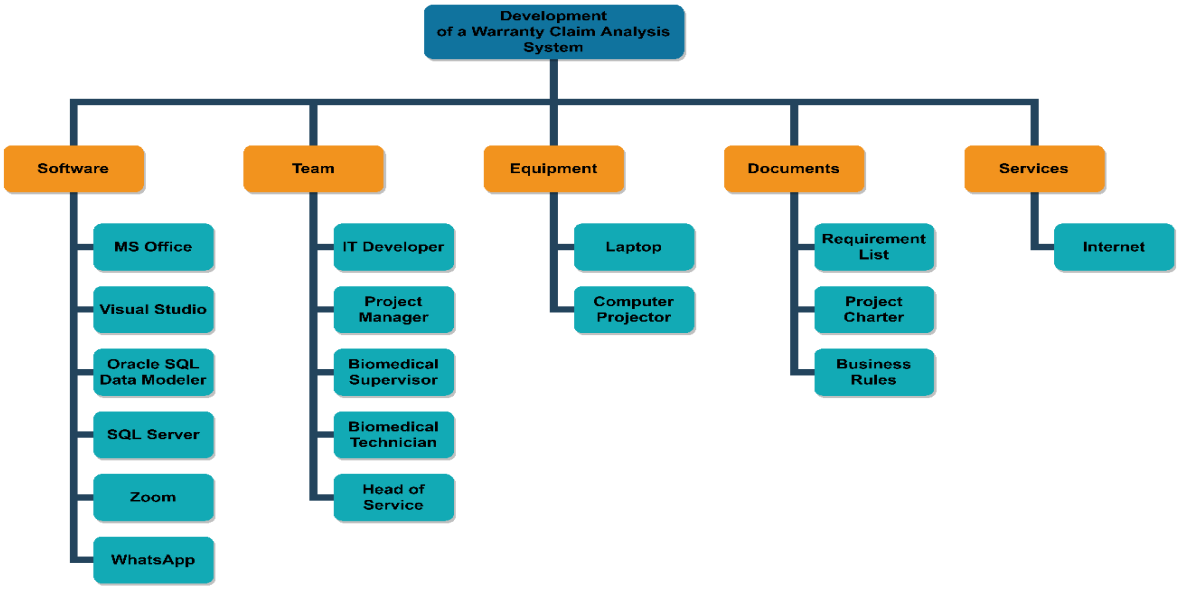
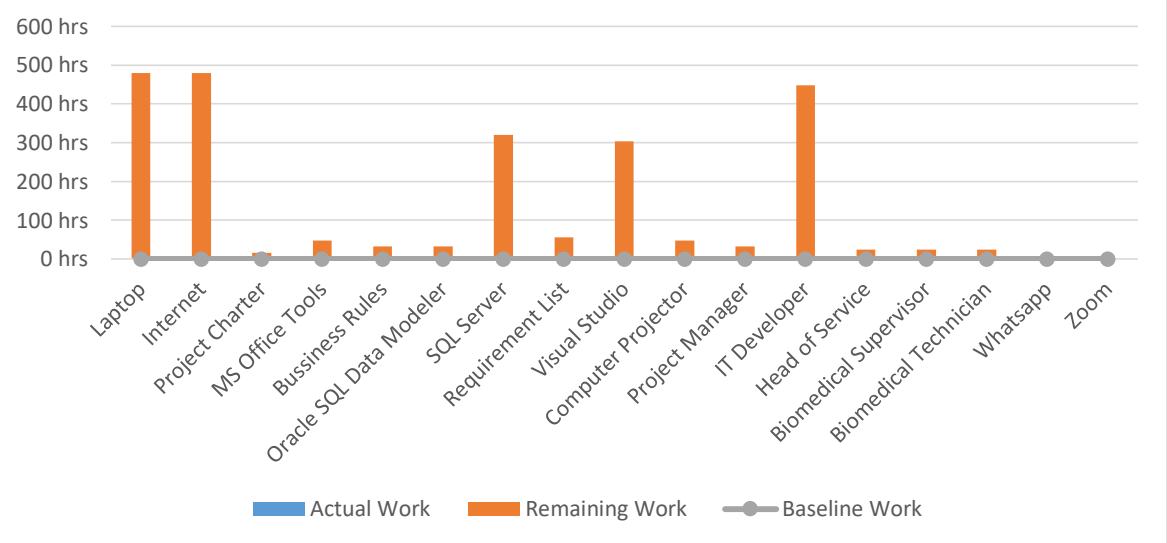


Chart 25

Resources Estimation

Name	Category	Start	Finish	Remaining Work
Laptop	Equipment	08/03/21	11/18/21	480 hrs
Internet	Service	08/03/21	11/18/21	480 hrs
Project Charter	Document	08/06/21	08/09/21	16 hrs
MS Office Tools	Software	08/10/21	11/18/21	48 hrs
Business Rules	Document	09/01/21	09/06/21	32 hrs
Oracle SQL Data Modeler	Software	09/01/21	09/06/21	32 hrs
SQL Server	Software	09/01/21	11/05/21	320 hrs
Requirement List	Document	09/07/21	09/15/21	56 hrs
Visual Studio	Software	09/14/21	11/05/21	304 hrs
Computer Projector	Equipment	11/08/21	11/15/21	48 hrs
Project Manager	Team	08/03/21	08/10/21	32 hrs
IT Developer	Team	09/01/21	11/18/21	448 hrs
Head of Service	Team	11/08/21	11/10/21	24 hrs
Biomedical Supervisor	Team	11/11/21	11/15/21	24 hrs
Biomedical Technician	Team	11/11/21	11/15/21	24 hrs
WhatsApp	Software	08/03/21	11/19/21	-
Zoom	Software	08/03/21	11/19/21	-



Assumption of Estimation

- The company has internet connection available.
- The platform will be developed using free license software and those who require payment have been bought by the company before the project planning.
- The IT developer will be available to develop the platform within its routine work.
- Personal laptop or desktop computer is assigned to the IT Department.
- The company possesses computer projector.
- The company has an area where the training course can be offered.
- The current company licenses related to MS Office Tools, Zoom will be available.

Team Development

This process improves the competences, member interaction and the organizational work environment, which enhance the chances of performing the activities required for the project, successfully.

Due to Covid-19 National Emergency, to train the team, it will be required the use of online platforms to communicate and store information, related to project development, the same as training and project progress monitoring will be done through virtuality, as follows:

Shared platform: Information related to the project will be communicated using corporate email and through MS SharePoint.

Video conferencing: This is an important way of communication among project teams, following the measures of biosecurity, established by the government to avoid Covid-19 spread, using Zoom or Google Meetings Website.

Email and Chat: Regular communication or doubts that may exist, during the project's execution will be done using tools like MS Outlook and WhatsApp.

Interpersonal and Team Skills

Conflict resolution

Problems related to personal behavior among project staff, stakeholders and others that could appear during the project development will be managed through the Human Resources department's internal processes. By applying preventive or corrective measures, based on the internal and organizational company´s work policy, internal ethic code or under Honduran working laws.

Team building

Related to team building techniques that can help to build a collaborative and cooperative working environment, the project team will use 10 minutes of the weekly report meetings, to deal with topics related to professional support or improving working environment, personal problems, fostering better presentations to improve motivational and emotional control.

Staff Acquisition and Release

Staff needed, in this project is composed by current company's employees, does not require to hire new members. Once the project starts, the team must focus its actions to the project development, nevertheless, it will be possible to attend other activities, due to any emergency or company requirement. As the project finishes, each member will be released of responsibility, returning to its former role.

Training Requirements

There is no need for special training to develop the project, current knowledge and skills are enough to achieve what is expected.

Individual and Team Assessment

Once the project deliverables have finished and before the project completion, the project's team will undergo an individual Self-Assessment (see appendix 10) and a Team Assessment (see Appendix 11), to raise awareness of their strengths and weak areas. This will permit human resources department to establish a training plan, based on results.

Meetings

Meetings will be set up in order to discuss and attend topics related to project’s problems resolution, updates and progress, among others. The staff agreed meeting on Zoom Platform or Google Meeting. And meeting length may vary depending on the topic, and it is mandatory to spend ten minutes for regular teams´ talks and presentations. In fact, there will be two types of meetings, as follows:

- **Weekly Meetings**: This meeting is used to share project's updates and to request and exchange information related to project needs.
- **Monthly Meetings**: This meeting is directed by the Project Manager, Project Sponsor and stakeholders. Its objective is to share information related to project progress, financial executions, management problem, possible project's delay and change requested by the main stakeholders.

Resource Management Plan, Change Process

The Resource Management Plan defined in this document, can only be changed through the change management process and requested by the project sponsor. Requirements must be documented and authorized by the project manager and project sponsor. When Change Request Format is not submitted, changes will not proceed, and the project manager will have solely the right to refuse changes. Once, the change is required and fulfills requirements, the project sponsor will have two working days to approve or deny changes. Any change request should be documented and its approval depends on the priority and how its approval or denial can affect the project completion.

Roles and Responsibilities

Roles and responsibilities during all the project life cycle are listed in the following **Chart 26**.

Chart 26

Resources Management Roles and Responsibilities

Name	Role	Responsibilities
Konny Nehring	Project Sponsor	• Approve changes in scope. • Evaluate needs of scope changes. • Accept project deliverables. • Approve changes in schedule. • Evaluate needs of schedule changes. • Accept project deliverables. • Approve each advance in the schedule plan. • Approves any cost addition. • Approved quality changes • Approve changes and communication channels. • Approves any resources needing procure.
Victor Suazo	Project Manager	• Facilitates project change requests. • Approve changes in scope. • Organize and facilitate schedule change control. • Facilitates project change requests. • Request to project sponsor to approve changes in schedule. • Organize and facilitate schedule change control. • Communication outcomes of schedule change requests. • Communication of advances in the project activities of scope change requests. • Ensures that the project accomplishes with the schedule and activities within the plan. • Oversight the Quality Management Plan. • Ensures that quality control is done. • Ensures that project requirements are fulfilled. • Schedule meeting for testing processes. • Prepare Final presentation of project review. • Schedule Online Meetings.

Name	Role	Responsibilities
		• In charge of quotations of software, hardware or services.
Service Supervisors	Team Member	• Participate in change process analysis.
IT Developer	Developers	• Validate if scope changes can be applied. • Propose scope changes. • Document any delay in the project activities. • Request schedule changes. • Update the calendar activities. • Use company's resources. • Elaborate process to ensure quality • Ensures that platform requirements are followed. • Ensures that each SDLC phase is complete. • Document all fullfilled requirements. • Frequent communications flow related to project updates. • Yield report related to project status. • Attain specify technical requirements of software, hardware or services.

Responsibility Assignment Matrix

Chart 27 shows the assignment of responsibilities of the project work package level 1, each of them has been categorized as follows:

R: Responsible A: Accountable C: Consult I: Inform

Chart 27

Responsibility Assignment Matrix (RAM)

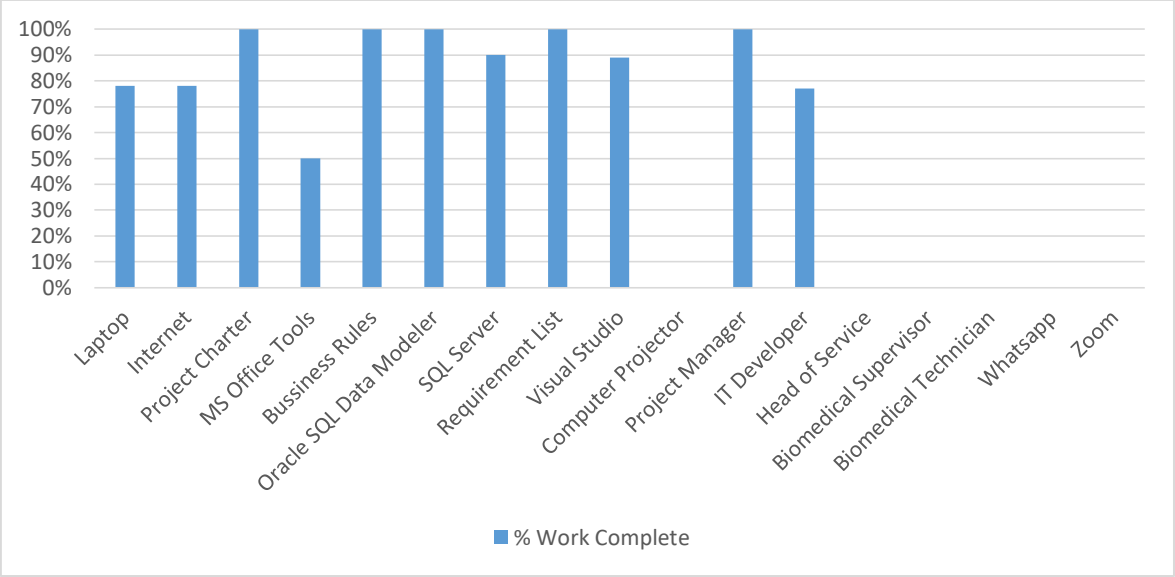
RACI Chart	Person			
Activity	**Konny**	**Victor**	**Obdulio**	**Veronica**
Analysis	I	R	C	I
Design	A	C	R	I
Development	I	C	R	I
Testing	I	C	R	A
Implementation	I	C	R	I
Training	I	C	R	I
Documentation	I	C	R	I

Resource Control

The control resource process will be performed daily, as the Project progresses using platforms such as Microsoft Project generating automatic Resource Overview report, where the percentage of work done by all the work resources is displayed within the graph shown in Figure 40 and other elements as resource status graphs and charts.

Figure 40

Work Status Example



4.7 Project Communication Management

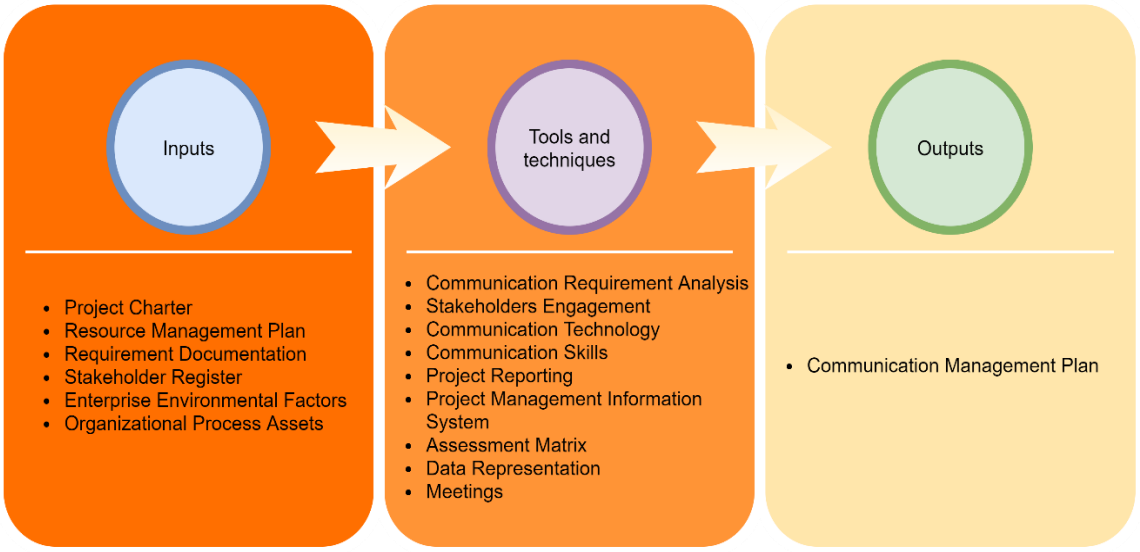
The communication management plan defines, the approved and official communication channels where project stakeholders and staff can communicate themselves and establish time on how the project updates will be shared, and who can be informed. In this way, the information needed by the stakeholders is ensured and can be shared through accessible channels that do not require an investment for the company.

The benefit of the communication management plan, is that it establishes the appropriate project communication activities and the information needed by individuals involved along the process.

Figure 41 provides the process needed to elaborate the Communication Management Plan

Figure 41

Communication Management Plan Development Process



Note. Adapted from: Project Management Institute, 2017, p. 366

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Role	Name	Signature	Date
Project Sponsor	Konny Nehring		
Project Manager	Victor Suazo		

4.7.1 Communication Management Plan

DCOSA DISTRIBUIDORA COMERCIAL S.A.	**Communication Management Plan**	
Version 1.0	Document ID: 009-DCSA-CMP	08/07/2021

Project Communication

To ensure the proper collection, creation, distribution and verification on communication and share information within the project, the following media are approved as a channel, between the team members and other stakeholders.

Roles and Responsibilities

Chart 28

Communication Management Roles and Responsibilities

Name	Role	Responsibilities
Konny Nehring	Project Sponsor	• Approve changes and communication channels.
Victor Suazo	Project Manager	• Prepare a project review for final presentation. • Schedule Online Meetings.
IT Department	Developers	• Periodic communication linked to project updates. • Yield generation related to project status.

Stakeholders Identification requirements

Chart 29 shows the communication requirements established by the project's stakeholders

Chart 29

Stakeholders Communication Requirements

Stakeholders	Name	Key Concerns	Communication Method	Frequency	Contact Information
Head of Service	Konny Nehring	Status Reports, virtual meetings, project phases, budget, schedule, risk monitoring	Email, Zoom, WhatsApp, Phone Call, Face to face	Weekly	knehring@dicosa.net
Service Supervisor	Veronica Montoya	Training	Email, Zoom	Once	dicosa37@dicosa.net
Biomedical Technician	Katia Castro	Training	Email, Zoom	Once	dicosa38@dicosa.net
Biomedical Technician	Romel Zelaya	Training	Email, Zoom	Once	dicosa36@dicosa.net
Biomedical Technician	Jose Matamoros	Training	Email, Zoom	Once	biomedicos@dicosa.net
Biomedical Technician	Marlon Castellanos	Training	Email, Zoom	Once	tecnicos42@dicosa.net
Biomedical Technician	Cristhian Rodriguez	Training	Email, Zoom	Once	tecnicos43@dicosa.net
Biomedical Technician	Pablo Funez	Training	Email, Zoom	Once	biomedicos2@dicosa.net
Biomedical Technician	Ariel Fajardo	Training	Email, Zoom	Once	biomedicos1@dicosa.net

Stakeholders	Name	Key Concerns	Communication Method	Frequency	Contact Information
Biomedical Technician	Jose Hernadez	Training	Email, Zoom	Once	biomedico58@dicosa.net
IT developer	Obdulio Pacheco	Status Reports, virtual meetings, project phases, budget, schedule, risk monitoring	Email, Zoom, WhatsApp, Phone Call, Face to face	Weekly	opacheco@dromeinter.com
Project Manager	Victor Suazo	Status Reports, virtual meetings, project phases, budget, schedule, risk monitoring	Email, Zoom, WhatsApp, Phone Call, Face to face	Weekly	visua@gmail.com
Customers	NA	None	None	None	
Sales Staff	NA	Project Closure	Email	Once	
Customer Protection Officers	NA	None	None	None	
Biomedical Equipment Manufacturers	NA	None	None	None	

Communication Matrix

Chart 30

Communication Matrix

Project Name:	Development of a Warranty Claim Analysis System
Project Objective:	To create a warranty management system that can be used to analyse, approve, deny and record warranty claims from customers.

ID	Deliverable	Description	Delivery Method	Frequency	Responsible	Audience
1	Project updates	Regular communication	Telephone Calls, Emails, WhatsApp	Need basis	IT Department	Project Sponsor, Project Manager
2	Reports	Project Status	Email	Weekly	IT Department	Project Sponsor, Project Manager
3	Presentations	Project review	Emails,Virtual Meetings	Once the project has finished.	Project Manager	Project Sponsor
4	Reviews and Meetings	Project Status	Emails, Virtual Meetings	Weekly, Monthly	Project Manager	Project Sponsor, IT Department
5	Training	Platform use	Virtual Meetings, Email	Once, before the project closure.	IT Department	Head of Service Biomedical Supervisor Biomedical Technician

Communication Standards

Communication process used within the project, and will be linear from sender and receiver, including feedback or awareness of message reception, when applied. All the information shared through official platforms must be confidential and will not be available for sharing with not authorized stakeholders or company members.

As part of the communication process, the responsible for transmission of information is the sender, and must ensure that the information was received and properly comprehend, in order to do so, communication skills required are include, but not limited to:

- **Communication competence**: Factors such as clarity of purpose when sharing information, effective relationship and leadership behaviors.
- **Feedback**: Information requested through the official communication media, must be replied within the first 24 hours, having an interactive communication within the project team and other project's stakeholders.
- **Presentations**: Weekly report is the official template to share information related to progress, updates and general information. This information must be stored within the MS SharePoint platform and shared through email using MS Outlook

Communication requirements Analysis

Communication channels that must be available to attend the requirements of the main three stakeholders involved in the project, is obtained, based on the following

formula (Lledó, 2017, p. 331) which established the minimum amount of communication channels required for the project:

$$\boldsymbol{Channels = \frac{n(n-1)}{2} = \frac{3(3-1)}{2} = 3}$$

Authorized communication channels

Email: via MS Outlook, it will be used to communicate and share information of the project, progress, updates, new orders, changes, meetings and all types of results, will be transmitted using the personal emails that will be assigned to team members. The official communication with external stakeholders will be through the use of Email.

Written information: It is the physical documentation shared to different departments and that can be posted in information's boards and social areas in order to inform news related to the project progress, it does not matter the level of hierarchy of the members.

Mobile Phones: This means of communication facilitates the exchange of information between project team and other stakeholders. The company has facilitated the device and communication plan with a local company. This will be used to transfer information related to the project with staff, which is out of the range and facilitates. At the same time, forward and upcoming information will use a diversity of apps like MS Outlook for mobile devices and instant messages like WhatsApp.

Virtual meetings: via Zoom, this platform permits the flow of communication with all the project stakeholders through mobile devices, desktop or laptops with internet

access. This communication media will be used to avoid long face to face meetings in order to communicate project progress and develop the training activities required once the project has finished.

Monitoring Communication

Meetings will be used to collect and distribute project's information to the project team and stakeholders. At the same time, during meetings the project team will monitor communication effectiveness of the project, respond to stakeholder requests and respond to project's needs that may appear during the week and require virtual meetings to be done, will be part of the meeting's agenda.

Meetings: In order to share information, support the actions defined in the communication plan, or even to solve problems. Meetings will be an effective means of transmitting instructions, sharing thoughts and finding solutions to problems that may exist within the project. Meetings will be splitted in:

- **Weekly Meetings**: This meeting is used to share project's updates and to request information related to project needs.
- **Monthly Meetings**: This meeting is performed by the Project Manager, Project Sponsor and stakeholders. Its objective is to share information related to project progress, financial executions, problems management, possible project's delay and change requested by the main stakeholders.

Project Reporting

Contains project's information related to baselines and important indicators that are needed to make decisions.

Weekly Report: Agreements stablished in meetings, must be formalized through a report that summarizes the meeting, and must be spread through Email. Possible changes must be formalized by the change process. (See Appendix 6: Weekly Report)

Project Report: Information concerned to the project will be obtained using MS Project and will be included within the report as follows (See Appendix 7: Project Report):

- **Cost overview**: It shows in summary the project's cost, remaining cost and % of completion of the project.
- **Burndown**: Shows how much work has been completed and how much is pending to be done.
- **Task burndown**: Shows how many tasks have been completed and how many more are pending.
- **Progress vs Cost Status**: Progress made versus the cost spent over the time.
- **%Complete**: Status of all top-level tasks.
- **Late Tasks**: Tasks that are past due.
- **Upcoming tasks**: Status of task starting in the next week
- **Remaining Task:** Status of remaining tasks that are due this week.
- **Earned Value**: Earned value based on the status date.

- **Variance over Time**: cost and schedule variance for the project based on status date.
- **Indices over time**: Cost and Schedule Performance Indexes for the project based on the status date.
- **Resource Status**: work status of all work resources
- **Work Status**: %work done by all the works resources

Project Satisfaction Survey

Once the project has completed the expected deliveries, the project manager will be in charge of assessing the project's team, and main stakeholder satisfaction related to the project, in order to confirm expectations and goals were achieved. This assessment will be done before the project closure, and results will be delivered to project sponsor, who will store the information for further projects. (See Appendix 12: Project Satisfaction Survey)

Communication Management Plan, Change Process

The Communication Management Plan defined in this document, can only be changed through the change management process and requested by the project sponsor. Requirements must be documented and authorized by the project manager and project sponsor. When Change Request Format is not submitted, changes will not proceed, and the project manager will have solely the right to refuse changes. Once, the change is required and fulfills requirements, the project sponsor will have two working days to approve or deny changes. Any change request should be documented and its approval depends on the priority and how its approval or denial can affect the project completion.

4.8 Project Risk Management

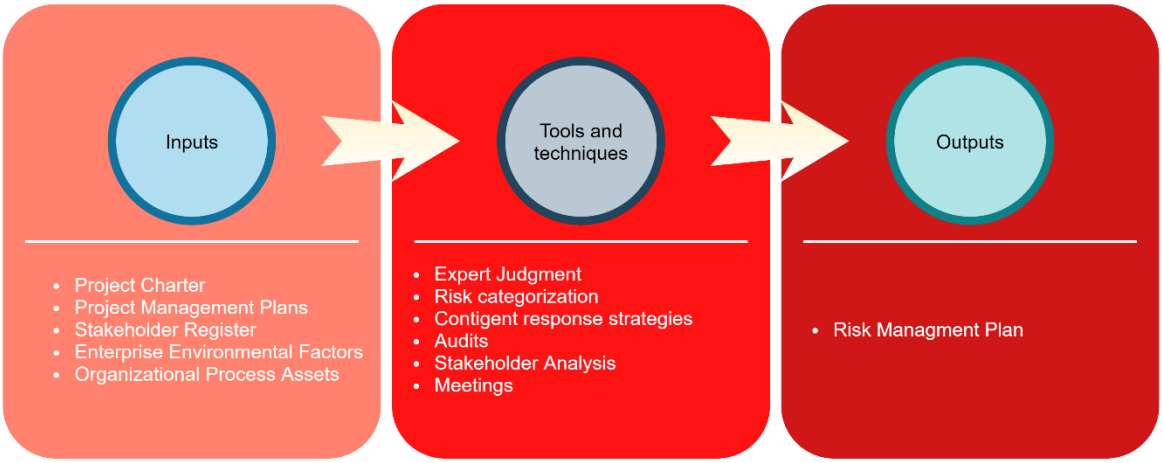
Project Risks were identified during the project charter creation, and some of them were added during the project plans development. The Risk management plan, includes the risk that can affect, certainly, the project development, likewise, as the qualitative analysis of each of the identified risks in order to know the chances of each risk can occur. Moreover, this analysis adds a response plan to those risks with high probabilities of occurrence.

Due to the project size, it is not needed to do a more detailed approach to risk management, and the evaluation, done, within the risk management plan covers the needs of the project.

The benefit of the risk management plan is highlighting all those areas that can affect the project development while recognizing each main risks updated in any stage of the project life cycle. **Figure 42** shows the inputs, techniques and outputs required to develop the risk management plan.

Figure 42

Risk Management Plan Development Process



Note. Adapted from: Project Management Institute, 2017, p. 401

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Role	**Name**	**Signature**	**Date**
Project Sponsor	Konny Nehring		
Project Manager	Victor Suazo		

4.8.1 Risk Management Plan

DCOSA DISTRIBUIDORA COMERCIAL S.A.	**Risk Management Plan**	
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Identifying Risk

The process of identifying risk is firstly done during the project charter development, but it can be updated in all the phases of the project and through the change management process. Risk can be added or deleted, depending on the change scenarios happening while developing the project. The risk register format that is found in Appendix 9: Risk Register, which must be updated with those risks that can appear during the project development.

Chart 31

Risk Breakdown Structure

RBS Level 0	RBS Level 1	RBS Level 2	RBS Level 3
Project Risk	1. Management Risk	1.1 Project Management	1.1.1 Experience
		1.2 Organization	1.2.1 Logistic 1.2.2 Budget
		1.3 Communication	1.3.1 Channels of communication
	2. External Risk	2.1 Legislation	2.1.1 Change in Law
	3. Technical Risk	3.1 Requirements definition	3.1.1 Scope
		3.2 Technology	3.2.1 Software 3.2.2 Hardware 3.2.3 Warranty Process
		4.1 Customers	4.1.1 Requirements

RBS Level 0	RBS Level 1	RBS Level 2	RBS Level 3
	4. Commercial Risk	4.2 Suppliers and Vendors	4.2.1 Previous Agreements

Risk Management Plan, Change Process

The Risk Management Plan defined in this document, can only be changed through the change management process and requested by the project sponsor. Requirements must be documented and authorized by the project manager and project sponsor. When Change Request Format is not submitted, changes will not proceed, and the project manager will have solely the right to refuse changes. Once, the change is required and fulfills requirements, the project sponsor will have two working days to approve or deny changes. Any change request should be documented and its approval depends on the priority and how its approval or denial can affect the project completion.

Risk Analysis

Quantitative Analysis

Quantitative analysis is the process of numerical analysis of the project's risks and other sources of uncertainty. Due to lack of high quality data of risk, lack of specialized risk data software, and mostly on the law project´s complexity, it is not required to proceed with a quantitative analysis.

Qualitative Analysis

Each risk must be analyzed using qualitative analysis and using the following scale, shown in the Probability and Impact Matrix.

Chart 32

Qualitative Risk Analysis Classification

Probability		**Threats**				
Very high	0.9	0.045	0.09	0.18	0.36	0.72
High	0.8	0.04	0.08	0.16	0.32	0.64
Medium	0.5	0.025	0.05	0.1	0.2	0.4
Low	0.25	0.0125	0.025	0.05	0.1	0.2
Very Low	0.1	0.005	0.01	0.02	0.04	0.08
Impact		0.05	0.1	0.2	0.4	0.8
		Very Low	Low	Moderate	High	Very High

Risk Response

Based on the results of the qualitative analysis applied to each risk, the project manager will use the following chart, to take actions that will be required to respond to each risk.

Chart 33

Risk Response

Priority	Score	Strategy	Description
High Risk	$x \geq 0.2$	Escalate Transfer	Depending on the situation the risk will be ladder to the project sponsor or delegated, to a third party, to solve the problem
Medium Risk	$0.05 < x < 0.20$	Mitigate	It is necessary to define corrective actions to reduce the probability
Low Risk	$x \leq 0.05$	Accept	No action will be taken

Risk Monitoring and Controlling

Risk monitoring and controlling will be performed weekly or as the project manager requires. This process has as a main objective to monitor the current status of identified risk and analyze new existent that can harm the project development. Project team will treat risk themes along with weekly meetings, assessing the current identified risks and when new risk appears, it will be necessary to register it, and assess this new risk, using the Risk Register Template (See Appendix 9: Risk Register)

It will be the responsibility of the project manager to guaranty that the risk topic is being assessed at a weekly frequency, during the weekly meetings and reported through the weekly report. Within the weekly review, current risks responses will be reviewed, in order to verify the effectiveness of overall project risk.

Risk Identified

Project Name:	Development of a Warranty Claim, Analysis System
Project Objective:	To create a warranty management system that can be used to analyse, approve, deny and record warranty claims from customers.

Chart 34

Risks Identified

RBS Code	Cause	Risk	Consequence
3.2.2	Server Capacity	Loss of information.	Not available space to store information of warranty claims.
1.2.1	Customers and Equipment information	Limited or zero customers' and sold equipment's information.	It will delay the process of integration due to lack of information about warranty claims.
1.1.1	Platform development skills	Not able to develop the project	It will be necessary to train the staff.
1.2.2	Budget	It could be necessary to do some expenses.	Delay of project development until the budget is authorized.
3.2.1	Technology software	Do not have the technology or software required to develop the project.	It will be necessary to change the software or procure new equipment that supports current versions.
1.3.1	Covid-19	Online Meetings	Misunderstanding and lack of communication due to meetings using limited free software.
4.1.1	Internet and energy needed to access	Delay the warranty claim process due to lack of energy or internet access	Increase customer dissatisfaction. Delay the process repair.

RBS Code	Cause	Risk	Consequence
1.2.1	IT workload	The project will not attain the schedule proposed	Delay in the project result delivery.
2.1.1	Legislation	There might be changes or new requirements in the current law for customer protection	It could be necessary to implement changes in the business rules, though new needs can be added to project requirements, therefore, time would increase on schedule or technology needed.
3.1.1	Limited Scope	Changes in scope.	May increase time or budget needed to complete the project.
3.2.1	Interface Complexity	Depending on project sponsor needs, the implementation of a personalized interface can increase the level of difficulty of designing the interface	Delay in the project schedule. Specialized program require a paid license.
3.2.3	Process Complexity	The complexity of the warranty process can delay the design process and module creation	Delay in schedule.
3.1.1	Warranty agreement	If, there is no service and warranty agreement signed with original manufactures, there will be no specific requirements and information required to create warranty claims.	Scope incomplete
4.2.1	Manufacturer Warranty conditions	Changes in requirements	Due to different brands being sold by DICOSA, each brand can request additional of more storing requirements.

Qualitative Analysis

Project Name:	Development of a Warranty, Claim Analysis System
Project Objective:	To create a warranty management system that can be used to analyse, approve, deny and record warranty claims from customers.

Chart 35

Risk Qualitative Analysis

RBS Code	Cause	Risk	Consequence	Probability	Impact	PxI
3.2.2	Server Capacity	Loss of information.	Not available space to store information of warranty claims.	0.1	0.2	0.02
1.2.1	Customers and Equipment information	Limited or zero customers' and sold equipment's information.	It will delay the process of integration due to lack of information about warranty claims.	0.5	0.2	0.1
1.1.1	Platform development skills	Not able to develop the project	It will be necessary to train the staff.	0.1	0.4	0.04
1.2.2	Budget	It could be necessary to do some expenses.	Delay of project development until the budget is authorized.	0.25	0.2	0.05
3.2.1	Technology software	Do not have the technology or software required to develop the project.	It will be necessary to change the software or procure new equipment that supports current versions.	0.1	0.4	0.04
1.3.1	Covid-19	Online Meetings	Misunderstanding and lack of communication	0.8	0.4	0.32

RBS Code	Cause	Risk	Consequence	Probability	Impact	PxI
			due to meetings using limited free software.			
4.1.1	Internet and energy needed to access	Delay the warranty claim process due to lack of energy or internet access	Increase customer dissatisfaction. Delay the process repair.	0.8	0.4	0.32
1.2.1	IT workload	The project will not attain the schedule proposed	Delay in the project result delivery.	0.5	0.4	0.2
2.1.1	Legislation	There might be changes or new requirements in the current law for customer protection	It could be necessary to implement changes in the business rules, though new needs can be added to project requirements, therefore, time would increase on schedule or technology needed.	0.1	0.4	0.04
3.1.1	Limited Scope	Changes in scope.	May increase time or budget needed to complete the project.	0.25	0.1	0.025
3.2.1	Interface Complexity	Depending on project sponsor needs, the implementation of a personalized interface can increase the level of difficulty of	Delay in the project schedule. Specialized program require a paid license.	0.25	0.1	0.025

RBS Code	Cause	Risk	Consequence	Probability	Impact	PxI
		designing the interface				
3.2.3	Process Complexity	The complexity of the warranty process can delay the design process and module creation	Delay in schedule.	0.1	0.2	0.02
3.1.1	Warranty agreement	If, there is no service and warranty agreement signed with original manufactures, there will be no specific requirements and information required to create warranty claims.	Scope incomplete	0.5	0.4	0.2
4.2.1	Manufacturer Warranty conditions	Changes in requirements	Due to different brands being sold by DICOSA, each brand can request additional of more storing requirements.	0.1	0.1	0.01

Risk Responses

Project Name:	Development of a Warranty, Claim Analysis System
Project Objective:	To create a warranty management system that can be used to analyse, approve deny, and record warranty claims from customers.

Chart 36

Risk Response

RBS Code	Cause	Risk	Consequence	PxI	Response
1.2.1	Customers and Equipment information	Limited or zero customers' and sold equipment's information.	It will delay the process of integration due to lack of information about warranty claims.	0.1	Customer's information will be necessary to be added within the current system on specific field, resulting in a new database.
1.3.1	Covid-19	Online Meetings	Misunderstanding and lack of communication due to meetings using limited free software.	0.32	To reduce misunderstanding in meetings, there will be necessity to record and share files by channeling communication within the communication plan.
4.1.1	Internet and energy needed to access	Delay the warranty claim process due to lack of energy or internet access	Increase customer dissatisfaction. Delay the process repair.	0.32	If, Blackouts will be necessary to secure the server´s connection and workshop connected to central electric generator.
1.2.1	IT workload	The project will not attain the schedule proposed	Delay in the project result delivery.	0.2	Due to high chances of having workload within the IT department, it is necessary to include within the schedule management plan, a reserve to reduce the chances of project delay.

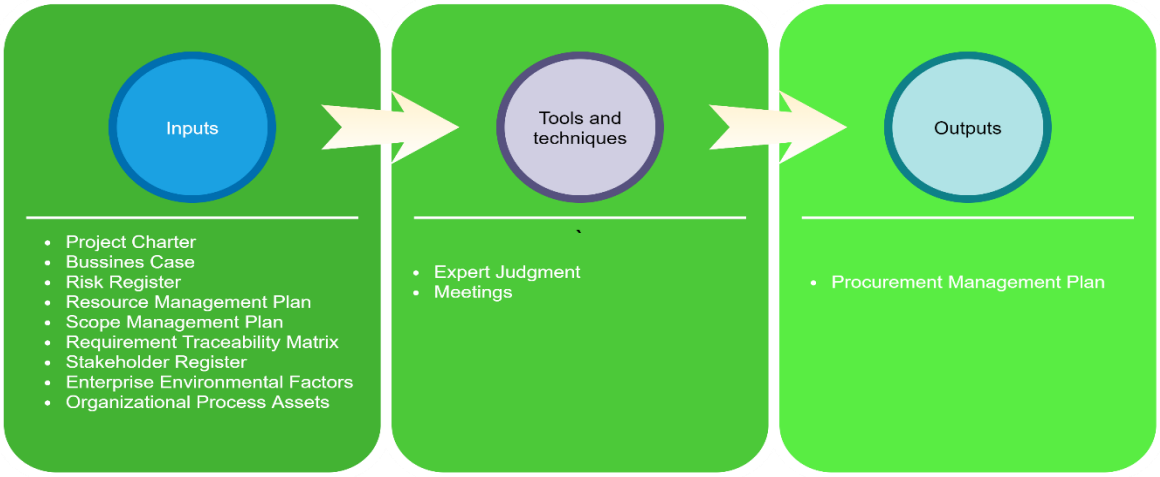
4.9 Project Procurement Management

Procurement Management Plan has been conducted based on the project stakeholder's instructions, which are to use the current resources that company possesses and limit expenses to zero. But, as change is an intrinsic part of the project, the Procurement Management Plan includes the process to procure and assess service, goods or any other resource, that may be required from the outside project team and organization.

Due to project complexity, the procurement process does not need tendering or special procurement considerations than normal local purchase, but, taking into account that it is required to look up for three different quotations to be approved. The benefit of the Procurement Management Plan is to determine whether acquiring goods and services based on the stakeholders' requirements or use current resources. **Figure 43** shows the inputs, techniques and outputs of developed process that were required to create the Procurement Management Plan.

Figure 43

Procurement Management Plan Development Process



Note. Adapted from: Project Management Institute, 2017, p. 466

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Project Sponsor	Konny Nehring		
Project Manager	Victor Suazo		

4.9.1 Procurement Management Plan

	**Procurement Management Plan**	
Version 1.0	Document ID: 011-DCSA-PMP	08/11/2021

Procurement Plan Purpose

The main purpose of the procurement management plan is to provide information related to how the procurement process and selection of resources, goods and services will be chosen, if needed.

Procurement Statement

The procurement process defined in this plan can be used to acquire hardware, software and service providers, that could be needed to develop the project.

Estimate Cost

Chart 37

Estimate Resources Cost

Type	Description	Cost
Hardware	Servers	$0
Software	License	$0
Services	Implementation	$0

Note: The project is being planned to be developed with current company's equipment and software needed for development, are license free. The IT department, which is part of the company, does not required to contract new members to make work the project.

Procurement Description

In case of special needs, goods and services can be procured, and added to this plan, through the change management plan and approved by the project sponsor. This process should be carried out with local providers, and, it is mandatory to present to project sponsor three quotations.

Procurement Management Plan, Change Process

The Procurement Management Plan defined in this document, can only be changed through the change management process and requested by the project sponsor. Requirements must be documented and authorized by the project manager and project sponsor. When Change Request Format is not submitted, changes will not proceed, and the project manager will have solely the right to refuse changes. Once, the change is required and fulfills requirements, the project sponsor will have two working days to approve or deny changes. Any change request should be documented and its approval depends on the priority and how its approval or denial can affect the project completion.

Performance Metrics for Procurement Activities

Chart 38 shows how to evaluate the variety of services, goods or product providers and, it should be for assessment and decision making:

Chart 38

Performance Metrics

Vendor	Product Quality	Delivery Time	Documentation Quality	Development		Cost Unit	Total
				Cost	Time		
1							
2							
3							

Scale

1- Unsatisfactory

2- Acceptable

3- Exceptional

The procurement will proceed with the product or service provider who possesses the highest score.

Procurement Team Roles and Responsibilities

Chart 39

Procurement Management Roles and Responsibilities

Name	**Role**	**Responsibilities**
Konny Nehring	Project Sponsor	• Approves any resources that need to be procured.
Victor Suazo	Project Manager	• In charge of quotations of software, hardware or services.
IT Department	Developers	• Specify technical requirements of software, hardware or services to be procure.

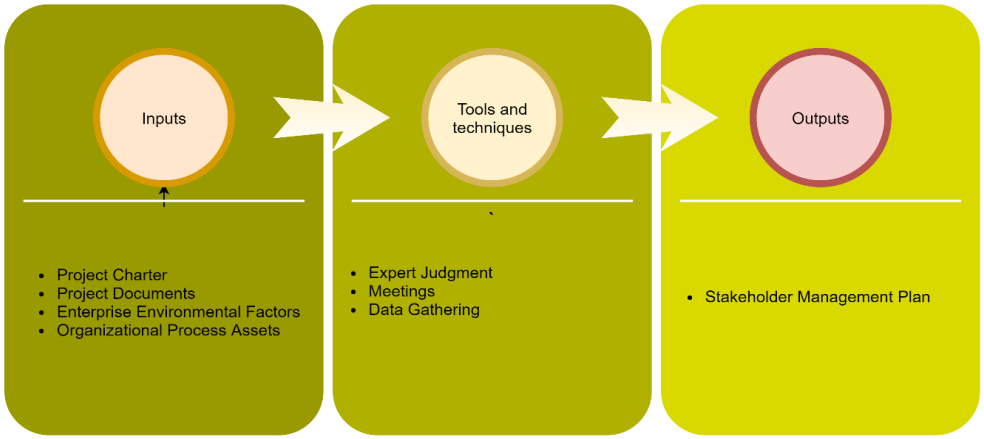
4.10 Project Stakeholder Management

The stakeholder management plan creation meets the tenth specific objective which states “To create the stakeholders management plan, identifying and supporting strategies, required to guarantee the satisfaction of the project's stakeholders.” To identify stakeholders of the project, it was necessary to categorize the different types, such as direct stakeholders referring to those who are directly involved with the project development, and its work, can be affected due to project development. The other type of stakeholder is the indirect ones, who get benefited, affected or related to the project deliveries, but does not have any authority within the project.

The stakeholder management plan increases the chances of project success, when recognizing worthiness of each of the stakeholders and their influence, power and impact within the project. So, the correct procedure to manage each stakeholder might make difference between a successful or failed project. **Figure 44** shows inputs, techniques, tools and outputs of the development process of the stakeholder management plan.

Figure 44

Stakeholder Management Plan Development Process



Note. Adapted from: Project Management Institute, 2017, p. 507

Document Tracking (Stakeholder Management Plan)

General Information

	Information
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Document Owner	Distribuidora Comercial S.A.
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Version	Issue Date	Changes
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Approvals

Role	Name	Signature	Date
Project Sponsor	Konny Nehring		
Project Manager	Victor Suazo		

4.10.1 Stakeholder Management Plan

DICOSA DISTRIBUIDORA COMERCIAL S.A.	**Stakeholder Management Plan**	
Version 1.0	Document ID: 012-DCSA-SMP	08/13/2021

Project Stakeholders

Project Stakeholders are those individuals or organizations whose can be affected by the project development, decisions or any outcome of the project. The stakeholders, have been categorized within two groups, direct and indirect stakeholders as can be seen on **Chart 40**.

Chart 40

Stakeholder Classification

Direct Stakeholders	Indirect Stakeholders
• Head of Service • Service Supervisors • Biomedical Technician • IT Department	• Customers • Sales staff • Customer Protection Officers • Biomedical equipment manufacturer

Stakeholder Responsibility

The direct stakeholders are listed within Chart 41, where each one's responsibility and authority is defined.

Chart 41

Stakeholder Responsibility

Name	Organization	Job Title	Responsibility and Authority
Konny Nehring	DICOSA	Head of Service	In charge of approval of changes, support and receive deliverables of the project.

Name	Organization	Job Title	Responsibility and Authority
Veronica Montoya	DICOSA	Service Supervisors	Receives training and validates project functionality.
Katia Castro	DICOSA	Biomedical Technician	Receives training and validates project functionality.
Romel Zelaya	DICOSA	Biomedical Technician	Receives training and validates project functionality.
Jose Matamoros	DICOSA	Biomedical Technician	Receives training and validates project functionality.
Marlon Castellanos	DICOSA	Biomedical Technician	Receives training and validates project functionality.
Cristhian Rodriguez	DICOSA	Biomedical Technician	Receives training and validates project functionality.
Pablo Funez	DICOSA	Biomedical Technician	Receives training and validates project functionality.
Ariel Fajardo	DICOSA	Biomedical Technician	Receives training and validates project functionality.
Jose Hernandez	DICOSA	Biomedical Technician	Receives training and validates project functionality.
Obdulio Pacheco	DICOSA	IT Developer	Design, develop, test and document software development.
Victor Suazo	Freelance	Project Manager	Project Management plans and consultancy related to project functionality.

Stakeholder Register

This project document is used to register any new stakeholder which includes the following information, (see **Chart 42**):

- **ID**: An incremental number starting from number one, that must be assigned to identified, each stakeholder, only.
- **Stakeholder**: The description, name or organization identified that must be registered within the chart.
- **Functional Area**: The area where the stakeholder is involved.

- **Roles-Responsibilities:** Description of the activities of each stakeholder and roles, that are identified and can be assigned.
- **Main expectations:** stakeholders' expectations of project's deliveries.
- **Major requirements:** Stakeholders' special requirements relate to the project.
- **Influence-Impact:** The level of influence that each stakeholder has and its possible impact to the project development.
- **Additional comments:** Any comments that can improve the description of each stakeholder.

Stakeholder Management Plan, Change Process

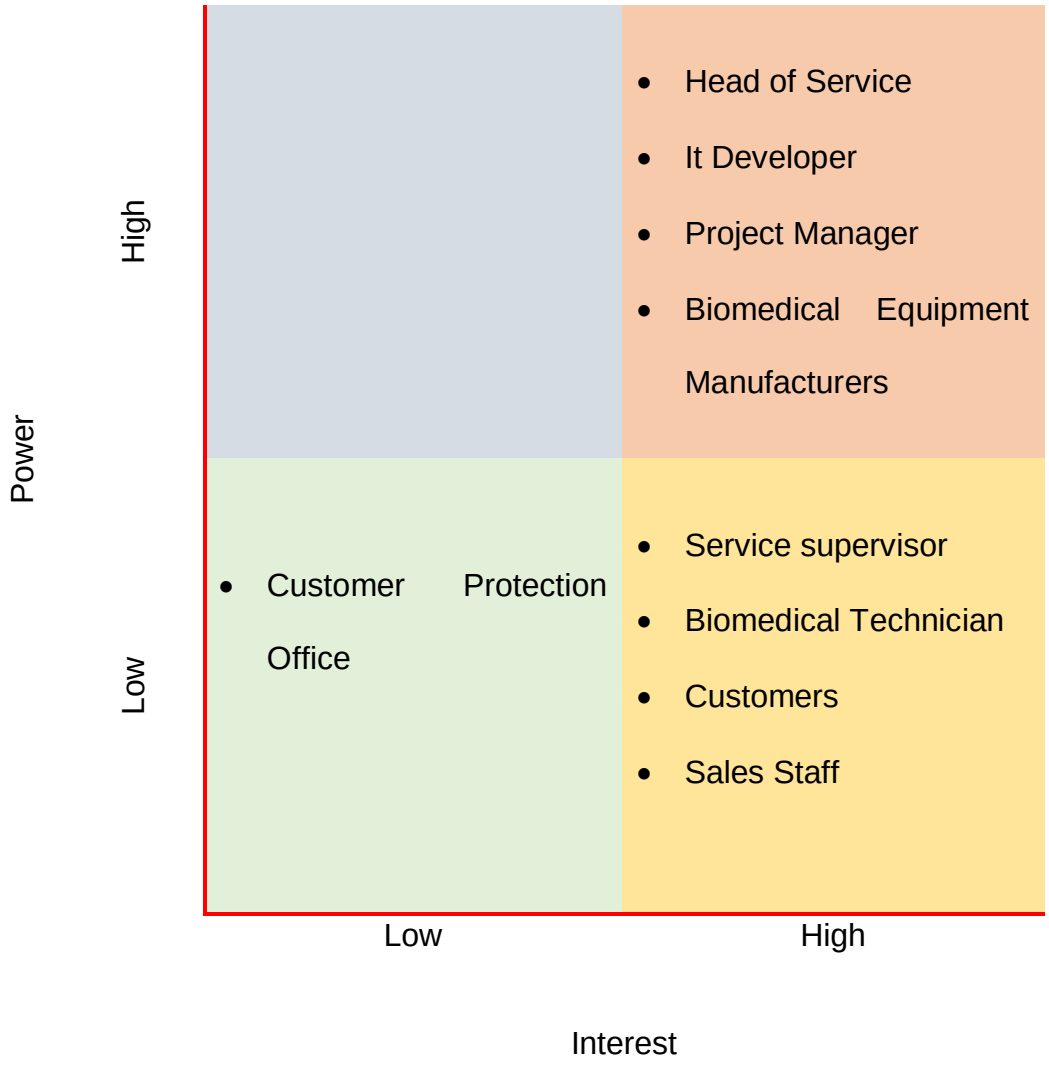
The Stakeholder Management Plan defined in this document, can only be changed through the change management process and requested by the project sponsor. Requirements must be documented and authorized by the project manager and project sponsor. When Change Request Format is not submitted, changes will not proceed, and the project manager will have solely the right to refuse changes. Once, the change is required and fulfills requirements, the project sponsor will have two working days to approve or deny changes. Any change request should be documented and its approval depends on the priority and how its approval or denial can affect the project completion.

Power Interest Matrix

Chart 43 is used to group the stakeholders according to their level of authority (power) within the project, and its level of concern and interest, related to the project completion. Its results are shown in **Figure 45**.

Figure 45

Power Interest Graph



Stakeholder's engagement, assessment matrix

This component of the stakeholder management plan is used to identify the strategies and actions necessary to promote activities that can enhance the chances of productive involvement of the stakeholders identified.

In **Chart 44** shows the stakeholder engagement, an assessment matrix, where stakeholders are assessed based on their Current Status represented with a "C" and the desired status is represented with a "D". In the horizontal axle the following categorization, are shown, based on Data Representation (Project Management Institute, 2017, p. 521):

- **Unaware:** Unaware of the project and potential impacts.
- **Resistant:** Aware of the project impacts and are reluctant to changes, that may occur as a result of the project executions. They can represent an obstacle for the project development. Need attention to change its categorization.
- **Neutral:** Stakeholders who are aware of the project, but, they don't show either a supportive or resistant attitude.
- **Supportive:** Stakeholders who are aware of the project and its impacts and are supportive of works and its outcomes.
- **Leading:** Aware of the impacts and actively engaged to ensure that the project will succeed.

Strategies to improve stakeholder's engagement

To reach new status expected from stakeholders who possess "current" and "desired" status, the following strategies will be applied, based on the information shown on Chart 44:

Service Supervisor: Its current state is neutral, but to make them a supportive stakeholder. A brief presentation will be shown by the project manager and remarking the benefits that the new system brings to, in terms of managing warranty claims, control and traceability of repair procedures.

Sales Staff: The current engagement status, of the sales staff, is neutral, but to improve it, into supportive, the head of service will explain the benefits of the platform and how the new process can offer an improved control of the equipment covered by warranty through this management system. At the same time, it will include, how this new process can help the sales staff to use this as a tool to improve the way they develop business, by explaining to customers how the warranty coverage of sales agreement, is fulfilled.

Biomedical Equipment Manufactures: To make them supportive, to the project execution, the benefits such as traceability and the chances of having an auditable process, that evaluates the correct application of the terms of warranty will be shared with them. Making possible to receive recommendations, support or even improvement of current warranty coverage or company's agreement with them.

Stakeholder register

Project Name:	Development of a Warranty, Claim Analysis System
Project Objective:	To create a warranty management system that can be used to analyse, approve, deny and record warranty claims from customers.

Chart 42

Stakeholder Register

ID	Stakeholders	Functional Area	Roles-Responsibilities	Main Expectations	Major Requirements	Influence-Impact	Additional Comment
1	Head of Service	Workshop	Project Sponsor who authorizes the project change management process, approves the deliverables and closure.	To control the workshop warranty process.	Warranty management system will be delivered on time and it will help the maintenance to record activities.	High	Project Sponsor
2	Service Supervisor	Workshop	To collaborate with the design process contributing to its process experience. Participate in the training sessions.	To have an easy process that facilitates control of warranty claims.	None	Low	

ID	Stakeholders	Functional Area	Roles-Responsibilities	Main Expectations	Major Requirements	Influence-Impact	Additional Comment
3	Biomedical Technician	Workshop	To collaborate with the design process contributing to its experience in the process. Participate in the training sessions.	The new platform should be easy to use.	None	Low	
4	IT developer	IT	To collaborate in the development, design, training and maintenance of the warranty management system	Complete the project, within the schedule programmed.	To receive support from the project manager and sponsor, if, extra resources are needed.	High	
5	Project Manager	Project Management	Collaborate on all project phases' activities needed to develop the project.	Complete the project and support the needs of the project team once the project starts.	Support from project sponsor.	High	

ID	Stakeholders	Functional Area	Roles-Responsibilities	Main Expectations	Major Requirements	Influence-Impact	Additional Comment
6	Customers	Others	None	To receive a warranty coverage that meets its requirements, and it is in accordance with the sales promise.		Low	
7	Sales Staff	Sales	None	Be able to use the warranty coverage and internal policies as a sales tool.	To have evidence, in case of claims and misunderstanding with their customers.	Low	
8	Customer Protection Officers	Others	None	The new process should be done respecting to the customer protection law.	The system match with information showed within the invoice sales	Medium	

ID	Stakeholders	Functional Area	Roles-Responsibilities	Main Expectations	Major Requirements	Influence-Impact	Additional Comment
9	Biomedical Equipment Manufacturers	Others	None	Be able to do internal and external audits.	Evidence Record	Medium	

Power interest Matrix

Chart 43

Stakeholder's Power Interest Matrix

Stakeholders		Classification (Low/High)		Comments
ID	**Name**	**Power**	**Interest**	
1	Head of Service	High	High	The head of service has the role project sponsor, having ultimate decision of approval and changes for the completion and goals achievement. At the same time, he has the role of head of service having interest in the project completion and goals achievement.
2	Service Supervisor	Low	High	The service supervisor, is a stakeholder, who has low power, yet, not a decisions maker, related to the project development. Its role within the project is as a supporter and it has high interest toward the results of this project, thus, it can affect the current way how its job is being done.

Stakeholders		Classification (Low/High)		Comments
ID	**Name**	**Power**	**Interest**	
3	Biomedical Technician	Low	High	The biomedical technician is one of the final users of the warranty system, it has low power of decision, but has high interest concerning to its performance that can be affected if the system is too complex.
4	IT developer	High	High	This stakeholder holds high power due to its project success, depends on it. The IT developer is responsiblefor the most crucial activities that will make the project achieving its goals. It is highly interested, its responsibilities within the company are to support other departments in the development of new systems and give them maintenance and training, as needed.
5	Project Manager	High	High	The project manager is in charge of planning and giving direct support to the project sponsor. His power is high, and he is highly interested that the project reaches the goals, proposed.

Stakeholders		Classification (Low/High)		Comments
ID	**Name**	**Power**	**Interest**	
6	Customers	Low	High	The customers have low power, the development of the project takes into account its needs, but, they do not have any role in the project development. They are highly interested on any claim they report within the warranty coverage of the equipment, it will be submitted through this platform.
7	Sales Staff	Low	High	Sales staff have no power in the development of the project, but they are highly interested on the results. The warranty coverage and after service performance can be used as a sales tool to catch the attention of future customers and keep current customers.
8	Customer Protection Office	High	Low	The customer protection officers will not be part of the project development, but it changes in law can affect the design, plan or

Stakeholders		Classification (Low/High)		Comments
ID	**Name**	**Power**	**Interest**	
				even the final delivery of the project. Their interest is low due to the fact that they will not be affected through the project delivery.
9	Biomedical Equipment Manufacturers	High	High	Equipment manufacturers can define what information must be recorded or even given to some advice on how the warranty's process must be done within DICOSA's internal processes. Any given instruction by the manufactures, must be taken into account and must generate a change request from the project staff. They are highly interested on the project's results as for information recorded within the system, can be used to audit the process.

Stakeholder engagement assessment matrix

Chart 44

Stakeholder Engagement Matrix

ID	Name	Unaware	Resistant	Neutral	Supportive	Leading
1	Head of Service					CD
2	Service Supervisor			C	D	
3	Biomedical Technician			CD		
4	IT developer					CD
5	Project Manager					CD
6	Customers			CD		
7	Sales Staff			C	D	
8	Customer Protection Office			CD		
9	Biomedical Equipment Manufacturers			C	D	

5. CONCLUSIONS

As a result of the development of the work objectives, the following conclusions were obtained:

1) The developed project management plan includes all necessary element to execute the project, and can be used as a base of knowledge to build new projects within the company. It was created using as reference “The Project Management Body of Knowledge (PMBOK Guide)” and including the ten knowledge areas expressed within it, and that contains instructions on how the processes should be executed, monitored and controlled. As it makes possible the achievement of the main project objective.

2) The integration management plan created, accomplished with the objective proposed. It identifies, unifies and contains elements for consolidation of the information required to coordinate the project activities by making an integration of the whole project's requirements, assumptions, and objectives within the project charter. Likewise, it includes the business case which established the current situation, the reason why this project is being developed and the change management process which is required to implement changes in the project and how the project manager will proceed.

3) The Scope management plan includes information that defines the project and product scope, providing a detailed description of the project’s expected to be deliverable, and the stakeholders’ requirements identified during the planning

phase. It also contains precise information of all the exclusions that are not contained within the project scope. Similar to the description of all project activities required to develop it, whose were included within the Work Breakdown Structure and explained on the Work Breakdown Structure Dictionary. Though, the scope management plan can be used to coordinate and guide the development of the Warranty Management System.

4) The schedule management plan was created as part of it, to manage the time line completion for the project, including all required activities to happen the project, as it was established on the breakdown work structure to assign each activity span, and sequencing for specific endeavor of the work package. It also includes the Gantt diagram and the critical path, as tools. That facilitate planning and monitoring process of the project, when having visual representation of how the project will be developed and the crucial activities that must be completed, on time, in order to avoid project's delays.

5) The cost management plan is the fourth, created, management plan. And includes all the activities required to manage, monitor and control the budget defined to complete the whole project. The cost estimation process used to define the project's budget represents an estimate scenario based on the current costs related to the recruitment process. In case of requiring a new IT developer or a baseline of the organization expenses related to salary payment of the current IT developer, calculated from the estimated working time which was defined on the schedule management plan. It also includes, the reserve and contingency costs

that could be required to respond to those delays or unforeseen work. Same for all those known-unknown existing in all types of projects. The cost management plan includes on a related section to project's control cost, using Earned Value Analysis, and used to measure the project completion, as soon as possible counter measures can be applied, in case of variations that can affect the project cost.

6) To verify if the project deliverables and all the requirements established by the stakeholders are accomplished, the quality management plan establishes activities, processes, procedures and acceptable criteria required to manage, control and inspect the project deliverables and the final product quality, based on the stakeholder's specifications and the achievement of the project scope, by meeting the Warranty Management System project objectives. It also defines the quality metrics and variables that will be monitored, to make sure that project does not only meet the product quality, but it is achieved, on schedule, cost and customer satisfaction expected once the project has finished.

7) Resources management plan, as part of management plans, contains the processes required to manage current resources of the company, demanded for the development of Warranty Management System. Not only defined within the resource breakdown structure a detailed categorization of the resources needed and the estimated time required, but also, it includes the techniques and tools that will be used to monitor the use of the equipment, material and staff through the project life cycle. At the same time, on this management plan are included all the

processes needed to improve the team's competences, conflict resolution, and how team will be recruited, and released, at the end of the project, evaluating, in the final stage, the individual and team's performance through the use of self-evaluation and team's evaluation templates included on Appendices section.

8) Communication is an essential component within the project's development, it is how the gist of the project progress and other interesting information is distributed to project's stakeholders. Communication management plan developed for the Warranty Management System Project includes all the necessary elements, to ensure that this information is delivered to the stakeholders on effectively meeting, as their requirements of type of information, communication channels and frequency should be distributed to each other. In addition, the number of channels needed to ensure a proper communication considers the current problems around the world which avoid direct contact between people, reducing the chances of getting COVID-19 while exploiting the online channels and software's, through Email, Microsoft Outlook, WhatsApp, Zoom and Phone Calls. On the other hand, this management plan defines reports that will be created using Microsoft Project software, and the analysis that will be done through it, to make it possible, to deliver main gist of the project progress for decisions made, on time.

9) Risks taking, permanent in all project, since, is a mandatory component, contemplated on the risk management plan. And it was established to identify, right away, risks of the project, by giving detailed instructions to proceed, and analyze, every qualitative risk, in order to assess every element based on it

probability and impact. The results of these analyses were used to create the risk response chart, pursuing establishment of activities that should be performed, once the risk appears. It also includes the process required to monitor the current status of the risks identified, and must be reported weekly to project's staff, who will use the risk register template and add new risks that could appear, as the project progresses.

10) The procurement management plan encompasses all elements required to attempt to the project, using the company's current equipment and software. As changes may occur, during the project's execution, it was considered the inclusion of the procurement management plan change process, and the acquisition process which is based on defined performance metrics, that can be used to assess procurement activities related to service, goods and products, just in case that the acquisition of extra resources is required and approved by the project sponsor.

11) Each stakeholders was identified on the stakeholder management plan, which included analysis of the project's stakeholders' expectations, its power and impact, during the project execution. Based on these findings, strategies were stablished to maintain effective engagement of them, and receive their support along with the project's execution, contributing to the project's objectives achievement.

6. RECOMMENDATIONS

As the Final Graduation Project progressed, during meetings, with Konny Nehring, who is the current head of service, it was found that there is no formal project management knowledge, applied to the company processes' and some of the actions performed by the company does not follow a defined process. Reason why, the following recommendations are given, to not only to enhance the chances of the project to fulfill its objective, but also to improve its processes.

1) The board of directors should include into its internal process, a formal manner to make projects working by following well-known and accepted practices, as it is proposed by the Project Management Institute within its Project Management Body of Knowledge, where tools, techniques and well defined procedures are indicated to make projects become possible. This will enhance the way the company works out, not only projects, but also, it helps to improve the current processes when adapting tools and techniques that can be useful for the performance of regular activities into the company performs.

2) The head of service should consider incorporation of its organizational assets, all documents and templates yield within this Final Graduation Project implementing, parallel to an internal process that improves the way how the company register the lessons learned as new knowledge appears, either through the development of project or needs of current processes.

3) The board of directors should consider to hire a new IT developer to elaborate the Warranty Management System, because of assigning project, just for one person, who is not related to other processes of the company, may improve the way the project is developed, by reducing the chances of inquiring the reserve and contingency schedule and cost budget, considered in the schedule and cost management plans.

4) The head of service should consider the addition of the warranty management system, into the SAP platform, that will be introduced at the beginning of the next year, making possible to link databases of the company with the fields required by the management system, for an easy relation among the sold equipment, the warranty coverage from the manufacturer, and each of the repairs order, for tracking the repair process and the resolution given to each problem.

5) The head of service should consider to improve the current equipment reception process, of the company, by implementing a service platform to generate repair orders and control other activities related to maintenance and the improvement, of both workshop management and its key performance indexes.

6) Considering the human resources as the most important factor for the development of the project. As an advice, it is recommended the board of directors consider creation of a recognition program, to reward those individuals who a key for success of the company´s project. This is an effective way to satisfy not only

the staff endeavor but to improve the organizational working environment and increase loyalty to the company.

7) As an advice, it is recommended the Project Manager follow and completes communication, with strategies, proposed to the stakeholder´s management plan, for achieving proper engagement of the project´s stakeholders to avoid undesirables and rejection from company´s members.

8) The head of service should consider the importance of a legal condition and warranty of written agreement, of both parties, as an obligation of distributors established in the Customer Protection Law, in article 19, clause 2, stressing that “It is an obligation of the distributors to provide the consumer truthful, appropriate and enough information, regarding to price and essential characteristics of the goods and services”. As well, as Article 35 states, that “the distributors must extend a warranty certificate". This document should include warranty conditions and must be customized depending on the type of equipment sold, and the warranty coverage given, by the original manufacturer.

9) The head of service should include, within its workshop processes, a live stream of communication, platform, for a direct online consultation from customers and for keeping track of current status of required procedures. Moreover, it receives and approves quotations, supervise and collect evidence of receipted equipment, and other findings covered during the preventive or corrective maintenance.

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8. APPENDICES

Appendix 1: FGP Charter

<table>
<tr><th colspan="2">PROJECT CHARTER</th></tr>
<tr><td>Date:</td><td>Project Name:</td></tr>
<tr><td>May 10,2021</td><td>Project Management Plan for Development of a Warranty Claim Analysis System Project within Workshop Department in Distribuidora Comercial S.A.</td></tr>
<tr><td>Knowledge Areas / PM Processes:</td><td>Application Area (Sector / Activity):</td></tr>
<tr><td>Knowledge Areas:
Project Integration Management
Project Scope Management
Project Schedule Management
Project Cost Management
Project Quality Management
Project Resource Management
Project Communication Management
Project Risk Management
Project Procurement Management
Project Stakeholder Management</td><td rowspan="2">After Sales Service/Maintenance</td></tr>
<tr><td>PM Processes:
Initiating Process
Planning Process
Monitoring Process
Closing Process Group</td></tr>
<tr><td>Project Start Date:</td><td>Project Finish date:</td></tr>
<tr><td>May 10,2021</td><td>November 05,2021</td></tr>
</table>

Project Objectives (General and Specific):

General Objective:

To create a project management plan for the Development of a Warranty Claim Analysis System project to be used in the Workshop Process of Distribuidora Comercial S.A

Specific Objectives:

1. To create an Integration Management plan that can be used to coordinate a variety of activities from the very first beginning to end.
2. To produce the scope management plan to make sure that all required work to develop Warranty Claim System is planned in order to conclude the project.
3. To create a schedule management plan containing constraining time that can be used as baseline to ensure completion within expected time.
4. To create cost management plan that will be used as a baseline to complete the project within an expected budget.
5. To define quality management plan to establish stakeholder's acceptance criteria related to the project deliverables
6. To create the resource management plan to ensure that all the necessary staff and assets are managed effectively within the schedule, budget and scope baselines planned.
7. To create a communication management plan defining communicative strategies to exchange information with project's stakeholders.
8. To create a risk management plan that identifies and analyses each risk that can affect the project's completion, reducing the probability and impact of negative risks.

9. To create the procurement management plan that defines the processes of how needed resources, for the project development, will be obtained.
10. To create stakeholder's management plan, identifying and supporting strategies, required to guarantee satisfaction of the project's stakeholders.

Project purpose or justification (merit and expected results):

The study will seek to propose a project management plan that can be used by Distribuidora Comercial in order to enhance the workshop process with the development of Warranty Claim Analysis System, which will increase their customer satisfaction indexes and at the same time fulfill legal requirements.

Distribuidora Comercial S.A well known as DICOSA is a Honduran company located in Tegucigalpa, specialized in surgical, medical equipment selling for hospitals, laboratory supplies, biomedical specialized maintenance among others, covering Honduras. It strong legal regulation is added to foster the company´s best reputation and to enhance its after sale services. Consumer protection law and its regulations establish that: "Provider commits total and free repairing of defected equipment, due to assembling, damaging or thirds affected. All sellers are committed to offer same warranty extended by original manufacturers" (Fiscalia del Consumidor, 2008). This requirement within the law, forces companies to accomplish with all legal procedures in order to sell any kind of goods.

The responsibility of warranty repairs lies on DICOSA's workshop department, where currently there is no internal warranty policy, defined processes or a warranty system

that allows the workshop personnel to evaluate the warranty coverage of the equipment sold by the company, or to store information related to warranty procedures. As a result, there is neither traceability, nor relation of the warranty offered by the matrix house, nor the warranty offered to the end consumer. This warranty coverage should be signed in a formal contract that provides legal backing to both customers and company.

To avoid legal problems complying with Honduran Law and increase the customer satisfaction related to after sales service process, it is necessary to develop a system that permits the company to track all units sold, the warranty coverage, conditions compliance, the warranty policy within a database that permits to collect and store evidence, warranty claims and resolution given to customers

Description of Product or Service to be generated by the Project – Project final deliverables:

A Project management plan containing all the subsidiary documents, that can be used as a framework to execute and control all the activities related to the implementation of a warranty analysis system within the Workshop Department of Distribuidora Comercial S.A.

Assumptions:

- There is enough project management knowledge to achieve the specific objectives of the project.
- There will not be any cost related to developing the project management plan.
- It is assumed that the student has full comprehension of the final project requirements.

- It is assumed that the schedule established by the UCI will not change.
- All the project advances and changes requested by reviewers will be delivered on time.
- It is assumed that project scope will not change and contain all stakeholder's requirements.

Constraints:

- Limited time to create the project management plans.
- There is no budget assigned to Initiation and Planning processes.
- Lack of experience in project management.
- Due to COVID-19 and pandemic regulations, all meetings with the workshop department will be online, making it difficult to understand the whole process.
- One person, the project Manager, must do all planning activities.

Preliminary Risks:

- If the student does not understand the Final Graduation Project instructions, the scope of the project cannot be achieved.
- If the defined time to develop the project management plan is not enough, the quality of the deliverables will not be as expected.
- If the company refuses to share information, the scope will not be achieved.
- If the student does not have project management experience, the quality of the deliverables will not achieve the standards required.

Budget:

The project will be carried out as part of the Final Graduation Project, having no cost related to labor of developing the project management plan.

Milestones and dates:		
Milestone	**Start date**	**End date**
1,Graduation Seminar	Mon 05/10/21	Sun 06/13/21
1.1,FGP Deliverables	Mon 05/10/21	Sun 06/06/21
1.2,Graduation Seminar approval,	Mon 06/07/21	Sun 06/13/21
2,Tutoring process	Mon 07/26/21	Sun 10/03/21
2.1,Tutor	Mon 07/26/21	Thu 07/29/21
2.2,Adjustments of previous chapters	Thu 07/29/21	Wed 08/04/21
2.3,Chapter IV.Results	Thu 08/05/21	Mon 09/20/21
2.4,Chapter V. Conclusions	Mon 09/20/21	Sun 09/26/21
2.5, Chapter VI. Recommendations	Mon 09/27/21	Sun 10/03/21
Tutor approval	Sun 10/03/21	Sun 10/03/21
3,Reading by reviewers	Mon 10/04/21	Sun 10/24/21
3.1,Reviewers assignment request	Mon 10/04/21	Sun 10/10/21
3.2,Reviewers work	Mon 10/11/21	Sun 10/24/21
4,Adjustments	Mon 10/25/21	Sat 11/20/21
4.1,Report for reviewers	Mon 10/25/21	Fri 11/05/21
4.2,FGP update	Sat 11/06/21	Sun 11/07/21
4.3,Second review by reviewers	Mon 11/08/21	Sat 11/20/21
5,Presentation to Board of Examiners	Sun 11/21/21	Fri 11/26/21
5.1,Final review by board	Sun 11/21/21	Tue 11/23/21
5.2,FGP grade report	Tue 11/23/21	Fri 11/26/21
FGP End	Fri 11/26/21	Fri 11/26/21

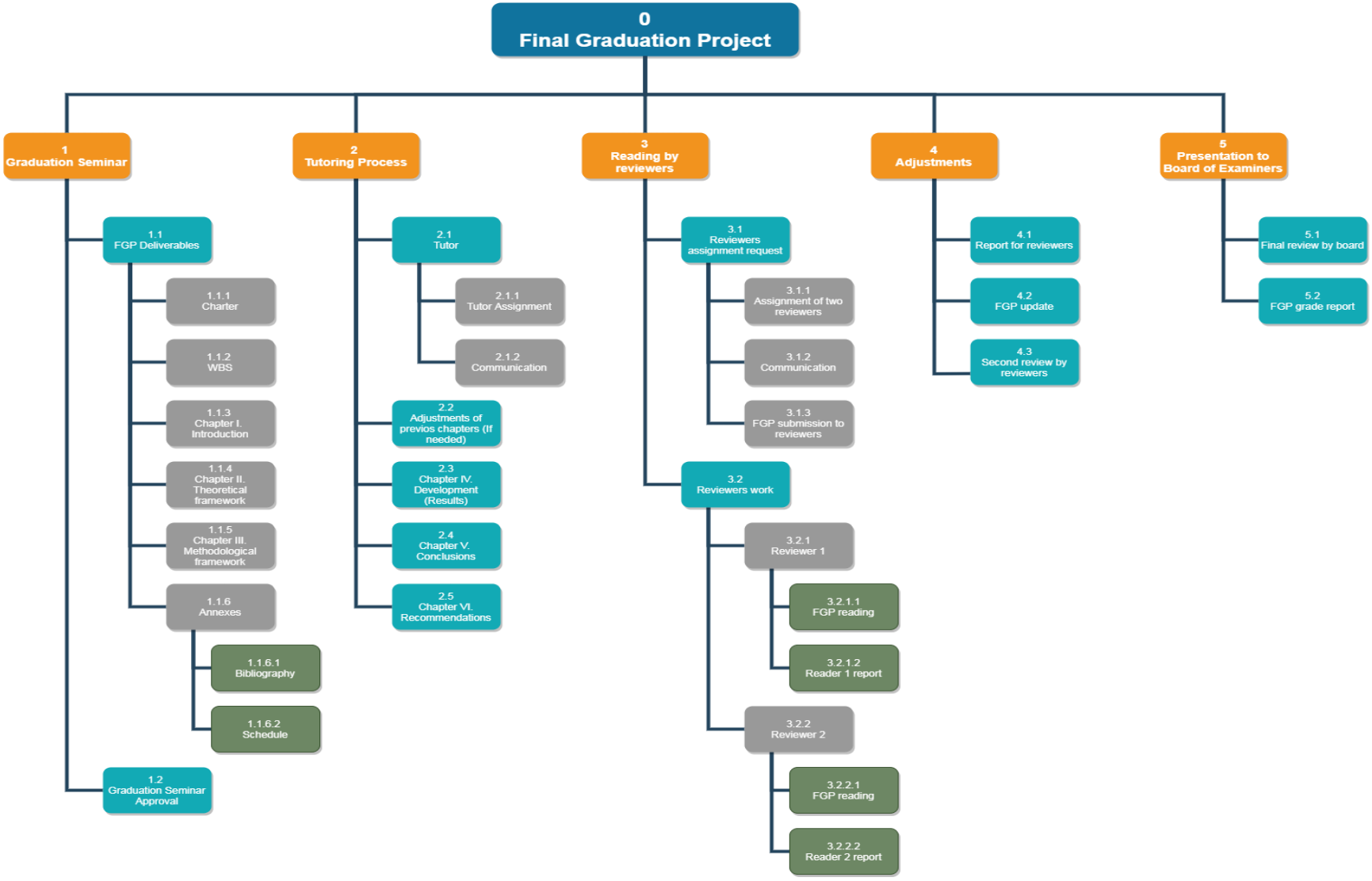
Relevant historical information:

Distribuidora Comercial S.A. is a Honduran company founded in 1971; it is part of a group of companies of high prestige within Honduras that represent multinational companies, dedicated to medical equipment and supplies.

Since 1971, DICOSA has given attention to more than 3000 customers (Distribuidora Comercial S.A., 2021), that includes public and private hospitals, clinics, and

<table>
<tr><td colspan="2">pharmacies among others. It has wide experience in specialized projects of medical equipment, health supplies, what makes DICOSA, a reference for national companies due to the quality of technical support and after sales service.
With the aim of continuing to be leaders in after service, they are looking to enhance the warranty process. Currently there is no information related to past projects related to the development of a warranty system or a warranty policy.</td></tr>
<tr><td colspan="2">Stakeholders:</td></tr>
<tr><td>• Direct stakeholders:
• Global School of Project Management, Universidad para la Cooperacion Internacional (UCI)
• Tutors and Course Lectures
• Reviewers
• Board of examiners
• DICOSA’s Head of Service</td><td>• Indirect stakeholders:
• DICOSA’s Service Supervisors
• DICOSA’s Biomedical Technicians
• DICOSA’s Customers
• Customer Protection Officers</td></tr>
<tr><td colspan="2">Approval:</td></tr>
<tr><td>Project Manager: Victor Aly Suazo</td><td>Signature:  </td></tr>
<tr><td>Authorized by: Konny Nehring</td><td>Signature:</td></tr>
</table>

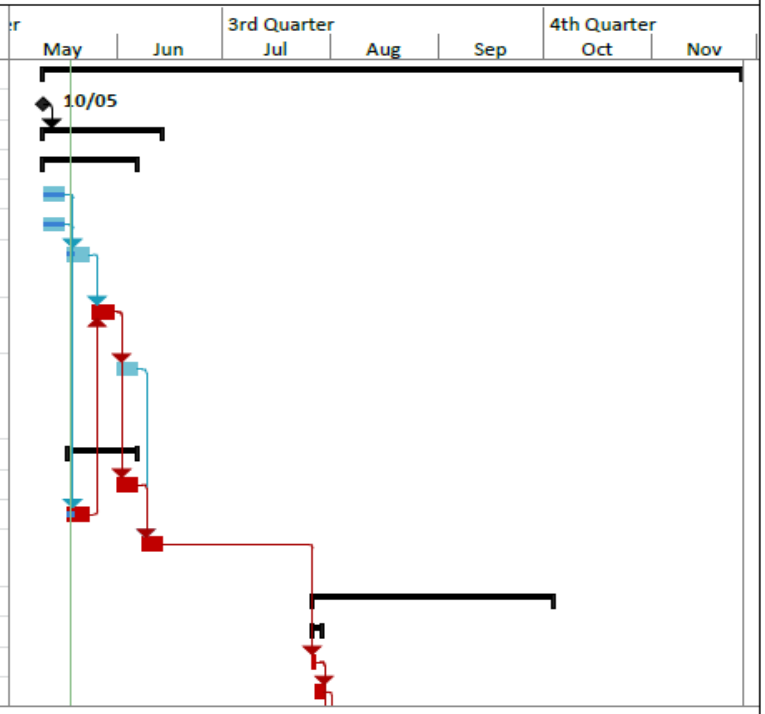
Appendix 2: FGP WBS



Appendix 3: FGP Schedule

FINAL GRADUATION PROJECT DEVELOPMENT SCHEDULE

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Final Graduation Project**	**200 days**	**Mon 10/05/21**	**Fri 26/11/21**	
2	FGP Start	0 days	Mon 10/05/21	Mon 10/05/21	
3	**1,Graduation Seminar**	**34 days**	**Mon 10/05/21**	**Sun 13/06/21**	2
4	**1.1,FGP Deliverables**	**27 days**	**Mon 10/05/21**	**Sun 06/06/21**	
5	1.1.1,Charter	6 days	Mon 10/05/21	Sun 16/05/21	
6	1.1.2,WBS	6 days	Mon 10/05/21	Sun 16/05/21	
7	1.1.3,Chapter I. Introduction	6 days	Mon 17/05/21	Sun 23/05/21	5,6FS+1 day
8	1.1.4,Chapter II. Theoretical framework	6 days	Mon 24/05/21	Sun 30/05/21	7,12FS+1 day
9	1.1.5,Chapter III. Methodological framework	6 days	Mon 31/05/21	Sun 06/06/21	8FS+1 day
10	**1.1.6,Annexes**	**20 days**	**Mon 17/05/21**	**Sun 06/06/21**	
11	1.1.6.1,Bibliography	6 days	Mon 31/05/21	Sun 06/06/21	8FS+1 day
12	1.1.6.2,Schedule	6 days	Mon 17/05/21	Sun 23/05/21	6,5FS+1 day
13	1.2,Graduation Seminar approval,	6 days	Mon 07/06/21	Sun 13/06/21	9,11FS+1 day
14	**2,Tutoring process**	**69 days**	**Mon 26/07/21**	**Sun 03/10/21**	
15	**2.1,Tutor**	**3 days**	**Mon 26/07/21**	**Thu 29/07/21**	
16	2.1.1,Tutor assigment	1 day	Mon 26/07/21	Tue 27/07/21	13FS+43 days
17	2.1.2,Communication	2 days	Tue 27/07/21	Thu 29/07/21	16



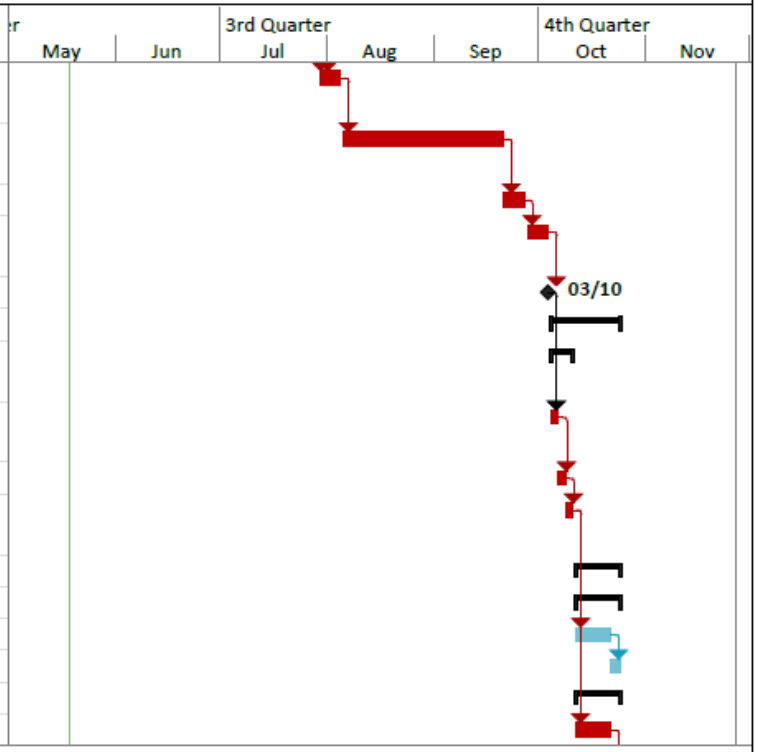
Project: FGP_Generic_Schedule
Date: Wed 19/05/21

Task	Inactive Task	Start-only	
Split	Inactive Milestone	Finish-only	
Milestone	Inactive Summary	Deadline	
Summary	Manual Task	Critical	
Project Summary	Duration-only	Critical Split	
External Tasks	Manual Summary Rollup	Progress	
External Milestone	Manual Summary		

Page 1

FINAL GRADUATION PROJECT DEVELOPMENT SCHEDULE

ID	Task Name	Duration	Start	Finish	Predecessors
18	2.2,Adjustments of previous chapters (If	6 days	Thu 29/07/21	Wed 04/08/21	16,17
19	2.3,Chapter IV. Development (Results)	46 days	Thu 05/08/21	Mon 20/09/21	18FS+1 day
20	2.4,Chapter V. Conclusions	6 days	Mon 20/09/21	Sun 26/09/21	19
21	2.5,Chapter VI. Recommendations	6 days	Mon 27/09/21	Sun 03/10/21	20FS+1 day
22	Tutor approval	0 days	Sun 03/10/21	Sun 03/10/21	21
23	**3,Reading by reviewers**	**20 days**	**Mon 04/10/21**	**Sun 24/10/21**	
24	**3.1,Reviewers assignment request**	**6 days**	**Mon 04/10/21**	**Sun 10/10/21**	
25	3.1.1,Assigment of two reviewers	2 days	Mon 04/10/21	Wed 06/10/21	22FS+1 day
26	3.1.2,Communication	2 days	Wed 06/10/21	Fri 08/10/21	25
27	3.1.3,FGP submission to reviewers	2 days	Fri 08/10/21	Sun 10/10/21	26
28	**3.2,Reviewers work**	**13 days**	**Mon 11/10/21**	**Sun 24/10/21**	
29	**3.2.1,Reviewer**	**13 days**	**Mon 11/10/21**	**Sun 24/10/21**	
30	3.2.1.1,FGP reading	10 days	Mon 11/10/21	Thu 21/10/21	27FS+1 day
31	3.2.1.2,Reader 1 repo	3 days	Thu 21/10/21	Sun 24/10/21	30
32	**3.2.2,Reviewer**	**13 days**	**Mon 11/10/21**	**Sun 24/10/21**	
33	3.2.2.1,FGP reading	10 days	Mon 11/10/21	Thu 21/10/21	27FS+1 day

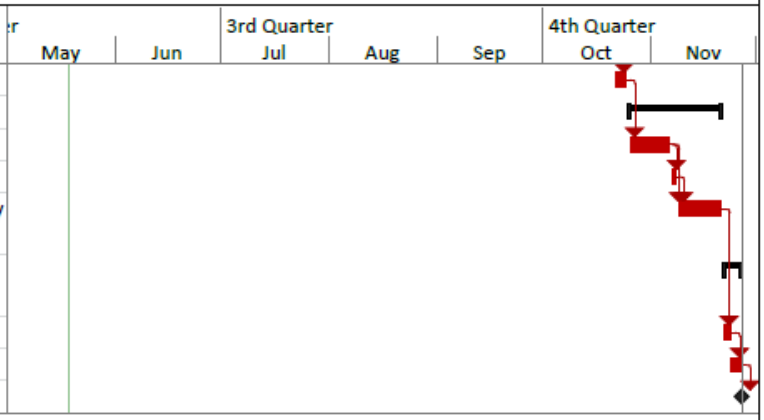


Project: FGP_Generic_Schedule
Date: Wed 19/05/21

Task	Inactive Task	Start-only	
Split	Inactive Milestone	Finish-only	
Milestone	Inactive Summary	Deadline	
Summary	Manual Task	Critical	
Project Summary	Duration-only	Critical Split	
External Tasks	Manual Summary Rollup	Progress	
External Milestone	Manual Summary		

FINAL GRADUATION PROJECT DEVELOPMENT SCHEDULE

ID	Task Name	Duration	Start	Finish	Predecessors
34	3.2.2.2,Reader 2 repo	3 days	Thu 21/10/21	Sun 24/10/21	33
35	**4,Adjustments**	**26 days**	**Mon 25/10/21**	**Sat 20/11/21**	
36	4.1,Report for reviewers	11 days	Mon 25/10/21	Fri 05/11/21	34FS+1 day
37	4.2,FGP update	1 day	Sat 06/11/21	Sun 07/11/21	36FS+1 day
38	4.3,Second review by reviewers	12 days	Mon 08/11/21	Sat 20/11/21	36,37FS+1 day
39	**5,Presentation to Board of Examiners**	**5 days**	**Sun 21/11/21**	**Fri 26/11/21**	
40	5.1,Final review by board	2 days	Sun 21/11/21	Tue 23/11/21	38FS+1 day
41	5.2,FGP grade report	3 days	Tue 23/11/21	Fri 26/11/21	40
42	FGP End	0 days	Fri 26/11/21	Fri 26/11/21	41



Project: FGP_Generic_Schedule
Date: Wed 19/05/21

Task		Inactive Task		Start-only	
Split		Inactive Milestone		Finish-only	
Milestone		Inactive Summary		Deadline	
Summary		Manual Task		Critical	
Project Summary		Duration-only		Critical Split	
External Tasks		Manual Summary Rollup		Progress	
External Milestone		Manual Summary			

Appendix 4: Change Request Format

DCOSA DISTRIBUIDORA COMERCIAL S.A.	**Change Request Format**	
Version 1.0	Document ID: 002-DCSA-IMP	08/03/2021

Project Name:			
Requested by:			
Issue Date:		**Change ID**	

Change Request (Please explain the reasons why change requesting):	
Expected impact:	**Priority**
	High ( )
	Medium ( )
	Low ( )

Affected Areas	
Integration	Resources
Scope	Communication
Schedule	Risk
Cost	Procurement
Quality	Stakeholders

Comments	
Resolution	**Final Status**
	Approved ( )
	Denied ( )
Project Manager Signature:	Date:
Decision Maker Signature:	Date:

Appendix 5: Document Tracking

Document Tracking (*Document Name*)

General Information

	Information
Document Id	*Insert document ID*
Document Owner	Distribuidora Comercial S.A.
Issue Date	*Insert Date*
Last Saved Date	*Insert Date*
File Name	*Insert Document Name (same as above)*

Change Control

Version	Issue Date	Changes
1.0	*Insert date*	*Detail Changes*

Approvals

Role	Name	Signature	Date
Project Sponsor	*Insert PS Name*	*Insert Digital Signature*	*Insert date*
Project Manager	*Insert PM Name*	*Insert Digital Signature*	*Insert date*

Appendix 6: Weekly Report

	**Weekly Report**	
Version 1.0	Document ID: 013-DCSA-CMP	08/07/2021

Project Name:	
Issued by:	
Issue Date:	

CPI		**% Project Complete**		**AC**	
SPI		**Planned Completion**		**CV**	

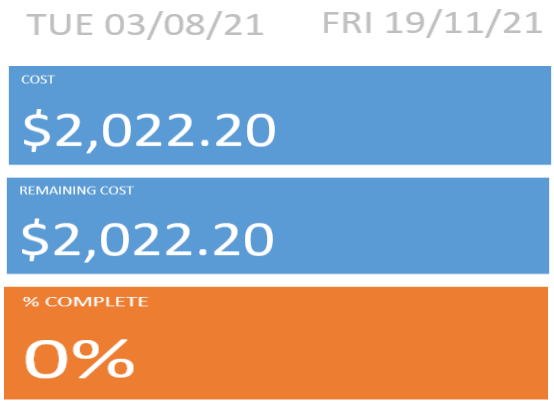
Description of Week updates
Reasons for Delays
Corrective Actions
Other information
Meeting Participants

Name	**Signature**

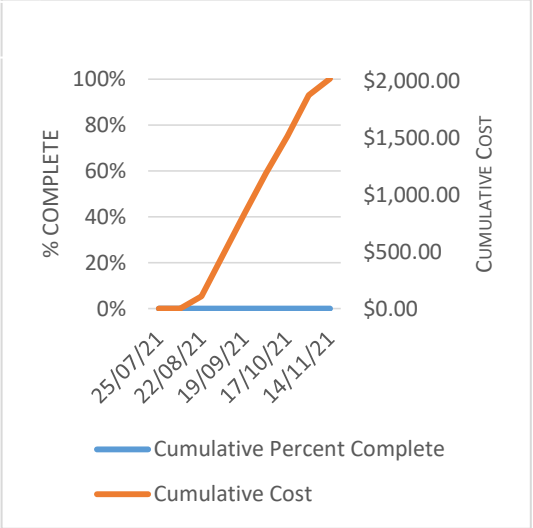
Appendix 7: Project Report

DCOSA DISTRIBUIDORA COMERCIAL S.A.	**Project Report**	
Version 1.0	Document ID: 017-DCSA-CMP	09/02/2021
Project Name:	Development of a Warranty, Claim Analysis System	
Project Objective:	To create a warranty management system that can be used to analyse, approve, deny and record warranty claims from customers.	

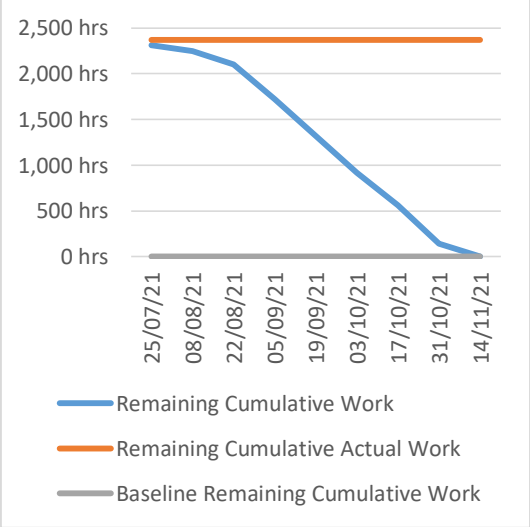
Cost Overview



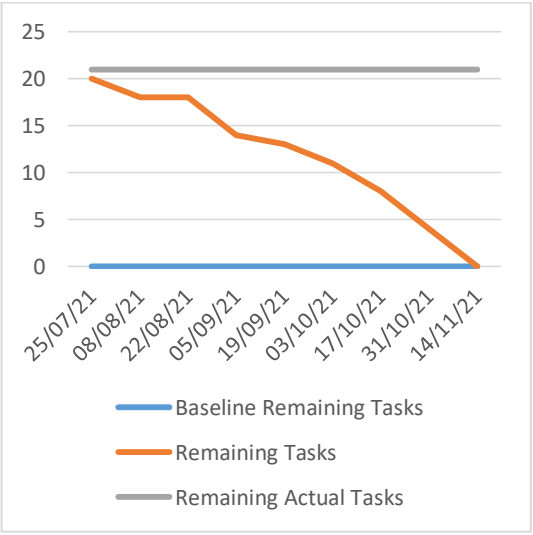
Progress vst Cost Status



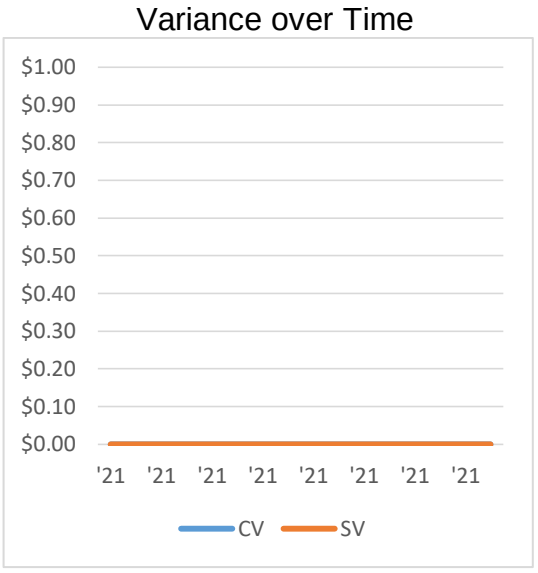
Burndown

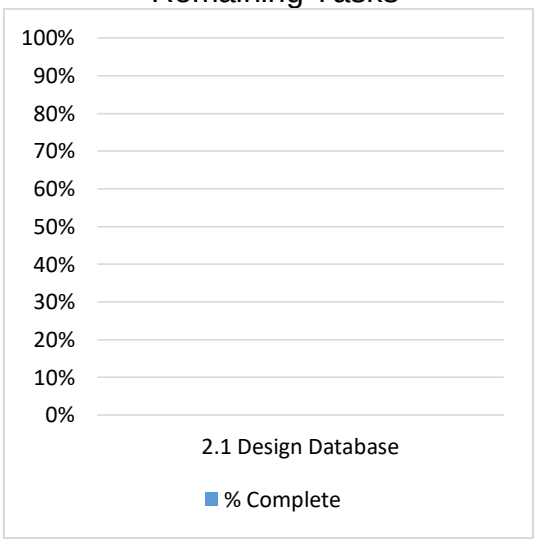


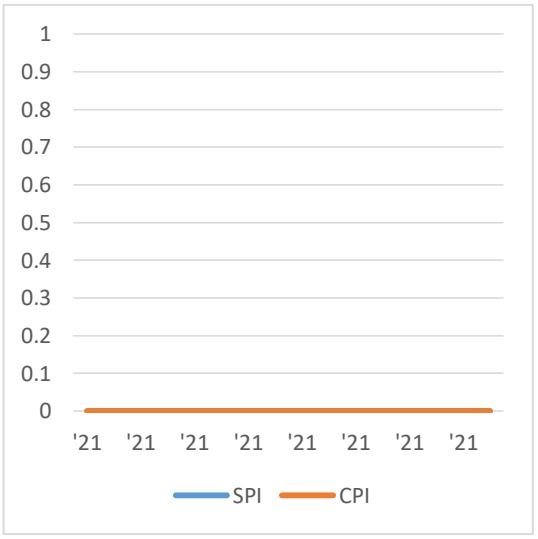
Task burndown

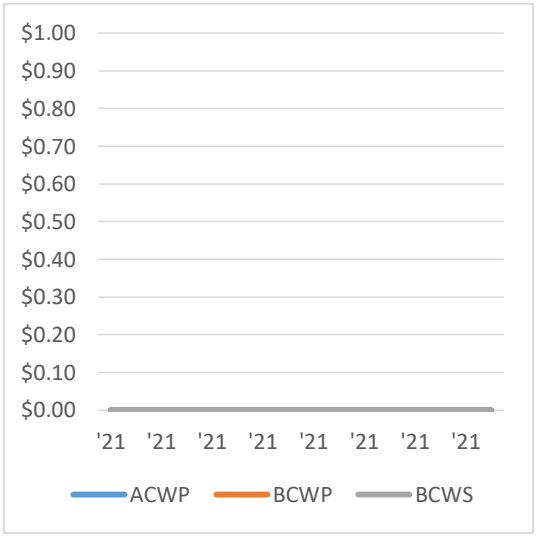


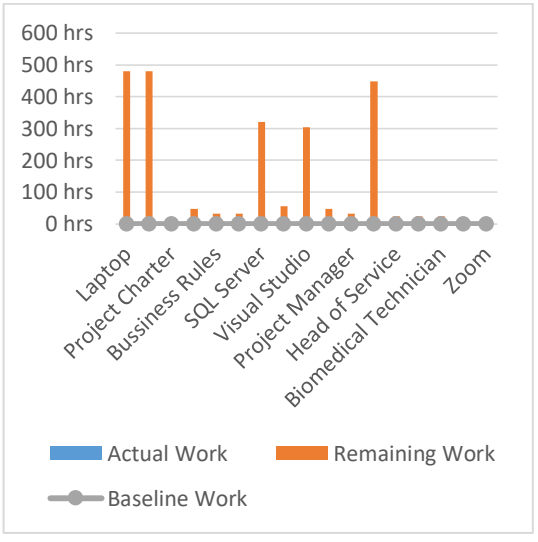

%Complete
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0%
Development of a Warranty Claim Analysis System


Variance over Time
$1.00
$0.90
$0.80
$0.70
$0.60
$0.50
$0.40
$0.30
$0.20
$0.10
$0.00
'21 '21 '21 '21 '21 '21 '21 '21
CV
SV


Remaining Tasks
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2.1 Design Database
% Complete


Indices over time
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
'21 '21 '21 '21 '21 '21 '21 '21
SPI
CPI


Earned Value
$1.00
$0.90
$0.80
$0.70
$0.60
$0.50
$0.40
$0.30
$0.20
$0.10
$0.00
'21 '21 '21 '21 '21 '21 '21 '21
ACWP
BCWP
BCWS


Resource Status
600 hrs
500 hrs
400 hrs
300 hrs
200 hrs
100 hrs
0 hrs
Laptop
Project Charter
Bussiness Rules
SQL Server
Visual Studio
Project Manager
Head of Service
Biomedical Technician
Zoom
Actual Work
Remaining Work
Baseline Work

Late Task

Name	Start	Finish	Duration	%Complete	Resource Names

Tasks starting soon

Name	Resource Names	Start	Finish	Work

Issue Date:	
Reported by:	
Received by	

Appendix 8: Quality Control

DCOSA DISTRIBUIDORA COMERCIAL S.A.	**Quality Control**	
Version 1.0	Document ID: 007-DCSA-QMP	08/06/2021

Project Name:	Development of a Warranty, Claim Analysis System		
Project Objective:	To create a warranty management system that can be used to analyse, approve, deny and record warranty claims from customers.		
Date		**Inspection No.**	

Requirement id	

Description	**Acceptable Criteria**

Findings	**Resolution**
	Approved ◯
	Rejected ◯

Comments
Supervised by: / **PM approval:**

Appendix 9: Risk Register

DCOSA DISTRIBUIDORA COMERCIAL S.A.	**Risk Register**	
Version 1.0	Document ID: 014-DCSA-RMP	08/09/2021

Project Name:	Development of a Warranty, Claim Analysis System			
Project Objective:	To create a warranty management system that can be used to analyse, approve, deny and record warranty claims from customers.			
Status:	Approved ( )	Denied ( )	**Change ID:**	

Please describe the risk found in the following table.

RBS Code	Cause	Risk	Consequence	Probability	Impact	PxI

Please assess the risk based in the results obtained in PxI and comparing it results within the following table.

Priority	Score	Strategy	Description
High Risk	$x \geq 0.2$	Escalate/Transfer	Requires response
Medium Risk	$0.05 < x < 0.20$	Mitigate	Requires Response
Low Risk	$x \leq 0.05$	Accept	No action will be taken

Does the risk requires to plan a response:	Yes	No
If yes, please describe the response proposed:		

Appendix 10: Self Evaluation

DCOSA DISTRIBUIDORA COMERCIAL S.A.	**Self-Evaluation**	
Version 1.0	Document ID: *015-DCSA-RMP*	09/02/2021

Project Name:	Development of a Warranty, Claim Analysis System		
Project Objective:	To create a warranty management system that can be used to analyse, approve, deny and record warranty claims from customers.		
Date		**Employee ID**	

Employee	
Position:	
Department:	

List your responsibilities within the project:				
Using the scale proposed, please assess your performance in relation to the following aspects:				
Poor	**Low**	**Moderate**	**Good**	**Outstanding**
1	2	3	4	5

Performance	**Evaluation**
Responsibility	
Job performance Quality	
Common Sense	
Compliance with the approve procedures	
Technical Knowledge	
Positive Attitude	
Following Orders	
Personal presentation	
Punctuality	
Ability to accept feedback	
Creativity	
Ability to work under pressure	
Leadership	
Learning Capacity	
Total	

Appendix 11: Team Evaluation

	**Team Evaluation**	
Version 1.0	Document ID: *016-DCSA-RMP*	09/02/2021

Project Name:	Development of a Warranty Claim Analysis System
Project Objective:	To create a warranty management system that can be used to analyse, approve, deny and record warranty claims from customers.
Date	

Using the scale proposed, please assess the team performance in relation to the following questions:				
Poor	**Low**	**Moderate**	**Good**	**Outstanding**
1	2	3	4	5

Question	**Evaluation**
Team understand goals and objectives clearly, and they were committed to them	
Everyone participate and is heard in group discussions	
The team demonstrates effective decision making	
The team makes clear work assignment and team members known what they should do	
Communication is open and honest	
Problems and conflicts are now swept under the rug. The team works through them openly	
There are no hidden agendas, and people feel comfortable being honest.	
Team members are accountable for their results and meet deadlines.	
Members support each other, even if someone makes a mistake.	
Team members are comfortable trying new things and taking risks.	
The team atmosphere is comfortable and enjoyable.	
Meeting are well run and productive.	

Comments:

Adapted from (JotForm, 2021)

Appendix 12: Project Satisfaction Survey

	**Project Satisfaction Survey**	
Version 1.0	Document ID: 018-DCSA-CMP	09/02/2021

Project Name:	Development of a Warranty Claim Analysis System
Project Objective:	To create a warranty management system that can be used to analyse, approve, deny and record warranty claims from customers.

Using the scale proposed, please assess the project in relation to the following questions:				
Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1	2	3	4	5

Question	**Evaluation**
Project has been successful, and driven desired business result.	
Comments:	
Team's expectations and requirements were understood and effectively implemented	
Comments:	
Project information was communicated in a timely and effective manner	
Comments:	
Project execution was effective, based upon established best practices, processes, and tools	
Comments:	
Overall rating for the success of the project	
Comments:	
Total Score	

Please list any additional comment regarding this project:

Adapted from (PM Foundations, 2011)

Appendix 13: Project Management Plans and Tracking Documents

Document ID	Document Name	Date	Version
001-DCSA-IMP	Project Charter	August 03,2021	1.0
002-DCSA-IMP	Change Request Format	August 03,2021	1.0
003-DCSA-SMP	Scope Management Plan	August 04,2021	1.0
004-DCSA-SMP	Schedule Management Plan	August 06,2021	1.0
005-DCSA-CMP	Cost Management Plan	August 06,2021	1.0
006-DCSA-QMP	Quality Management Plan	August 06,2021	1.0
007-DCSA-QMP	Quality Control	August 06,2021	1.0
008-DCSA-RMP	Resource Management Plan	August 07,2021	1.0
009-DCSA-CMP	Communication Management Plan	August 07,2021	1.0
010-DCSA-RMP	Risk Management Plan	August 09,2021	1.0
011-DCSA-PMP	Procurement Management Plan	August 11,2021	1.0
012-DCSA-SMP	Stakeholder Management Plan	August 13,2021	1.0
013-DCSA-CMP	Weekly Report	August 07,2021	1.0
014-DCSA-RMP	Risk Register	August 09,2021	1.0
015-DCSA-RMP	Self-Evaluation	September 02,2021	1.0
016-DCSA-RMP	Team Evaluation	September 02,2021	1.0
017-DCSA-CMP	Project Report	September 02,2021	1.0
018-DCSA-CMP	Project Satisfaction Survey	September 02,2021	1.0

Appendix 14: Certificate of Review

Tegucigalpa, Honduras, CA.

October 19th, 2021

Certificate of Review

Academic Advisor

Master Degree in Project Management (MPM)

Universidad para la Cooperación Internacional (UCI)

Dear Academic Advisor,

Sophia Crawford

I hereby confirm that Mr. Victor Aly Suazo Valladares has made all the corrections to the Final Graduation Project document, as I have advised. During this process, grammatical, typographic, lengthy sentences were reconstructed to make the paper more fluent and some repetitious words were changed to create a more interesting reading.

Sincerely,

Carlos Malcon Matute Castillo
MA. TESOL
Southern Illinois University of Carbondale/SIUC
United States of America.

Contact: E-Mail: unahcarlosmalcon2020@gmail.com
Cellphone: (504) 97948319

Appendix 15: Linguistic Credentials

Southern Illinois University
Carbondale
Graduate School

On recommendation of the Chancellor and Faculty,
the Board of Trustees, by virtue of the authority vested in it, has
conferred on

Carlos Malcon Matute Castillo

the degree of

Master of Arts

Teaching English to Speakers of Other Languages

and has granted this Diploma as evidence thereof
this fourteenth day of May, 2011

Chancellor

Dean

SOUTHERN ILLINOIS UNIVERSITY
CHARTERED 1869

President

Chairman of Board