UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL

(UCI)

FINAL GRADUATION PROJECT

Proposal of a Project Management Methodology for Scientific Research in Gilbert Laboratory, University of California, San Diego

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FINAL GRADUATION PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE

MASTER IN PROJECT MANAGEMENT (MPM) DEGREE

California, United States

September 2022

UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL

(UCI)

This Final Graduation Project was approved by the University as partial fulfillment of the requirements to opt for the Master in Project Management (MPM) Degree

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DEDICATION

I dedicate my graduation work to God, my family and close friends. Grateful to God for keeping me healthy throughout this pandemic and enabling me to learn more every day. A special feeling of gratitude to my loving parents, Juan Carlos Salas, and Ana Catalina Garcia whose words of encouragement help me to push through every time. My brothers Sebastian Salas, Juan Ignacio Salas and my sister Amelia Salas have never left my side even with me being away from home.

I will always appreciate close friends that have encouraged me through troubling times, with a special mention to Ashley R. Schorr for the many hours of proofreading and helping me through the entire master's. All of you have been my best cheerleaders.

ACKNOWLEDGMENTS

My gratitude goes out to this program, colleagues, and tutor for constant support and motivation throughout this work. I would like to thank specially my sister Amelia Salas for helping throughout the review and formatting of the document.

I would also like to thank the team of Gilbert laboratory, University of California San Diego and collaborators, for providing all the information to make this happen and allow me to work with them to apply this work.

ABSTRACT

The objective of this final graduation project is to propose of an integration a project management methodology for scientific research in Gilbert Laboratory, University of California, San Diego to improve the development and effectiveness of the workflow through each research project. The scientific community has developed multiple projects based on scientific methodology; however, the modification or implementation of project management methodology is profoundly important to allow for a better management of the time, scope, and constraints of each project. By implementing structure guidance as a tool, this will allow not only traceability and collaboration of all details for each project's needs but will also allow project managers to manage multiple projects with greater ease. For this final graduation project, the Project Management Institute is the base of the tailored methodology that consists of the nine knowledge areas that describe its component process, practices, inputs, outputs, tools, and techniques to be executed throughout a scientific research project. The result of this project is based on deliverables that will produce a standardization of project management templates for the research laboratories and their projects.

TABLE OF CONTENTS

INDEX OF FIGURES

INDEX OF CHARTS

ABBREVIATIONS AND ACRONYMS

Global Project Management	GPM
Laboratory	Lab
Post-doctoral	Postdocs
Principal Investigator	PI
Project management Plan	PMP
Scientific Research Project Management Methodology	SRPMM
University of California, San Diego	UCSD

EXECUTIVE SUMMARY

Scientific research continuously strives to make discoveries, but there are so many hurdles throughout the process that there is a higher probability of failure than success. For instance, a Principal Investigator or researcher comes up with an idea to test or design an experimental project to solve problems or find new applications. But like starting a project, this process requires many steps such as funding, systematic processing, standardized protocols-validated, quality controls, managing teams (PI, Postdocs, MDs, PhDs, grad students, research associates, undergraduates, staff administrators…), communication throughout many programs (emails, meetings, sharing documents online and offline), sample collection, inventories, data analysis and storage. All these moving pieces require a level of project management with the objective of minimizing avoidable mistakes from the beginning of the process in a controlled systematic environment by concentrating all the details in one place and allowing a more effective traceability.

Even though scientific research has done fine since the past, bringing a lot of solutions to our community, it's evident by working in the space the high level of work pressure while managing each research project. The level of stress that each researcher and collaborators must handle to respond to the funding sponsor and ensuring the science experiments go well, even it's likely that in the first trials might not get successful results. Each scientist strives to do its best to accomplish the scope of the project, however, it's key to having all the resources and tools to make this happen.

Seeking a solution to face these challenges is key because of multidisciplinary projects in research laboratories and all the risk factors, in the case of the Gilbert Laboratory at University of California, San Diego as a highly interdisciplinary research lab involved in medical, environmental microbiology and biotechnology, is to implement a methodology of project management to guide each researcher in the development of each project.

Even though research laboratories have been conducting projects ever since their inceptions, the Gilbert Laboratory, University of California, San Diego has never adopted any project management methodology. This has caused but also other factors mismanagement of projects such as poor workflow, miscommunication with collaborators, inconsistent planning, and poor traceability of projects that ultimately the projects are not completely successfully. Thus, exists the need to establish a project management methodology that It could be used across researchers.

These multi-project laboratories must have not only grant writers, managers, and researchers, but also an operations structure and project management guidance to maintain traceability of all projects. The implementation of an agile methodology of project management is key to the success of all projects that ultimately have a profound impact in knowledge and discoveries for life science and our society. The methodology proposed is based on the standard of Project Management Institute that would be the guidance for introducing a workflow and providing templates from the initiation of any project in the laboratory all the way to the end of the project. By implementing a structure guidance as a

tool, this will allow not only traceability and collaboration of all details for each project's needs, but also it will allow project managers an easier way to manage multiple projects

The general objective is to develop a project management methodology guide for scientific research to increase effectiveness and organization in projects for Gilbert Laboratory at University of California, San Diego. The specific objectives were: to propose a framework for standardizing projects based on the specific needs of scientific research; to develop project templates and techniques to apply to the management of future scientific research projects; to describe how the proposed methodology works to ensure in-depth understanding of the methodology; to create a workflow plan to utilize the proposed methodology.

According to Project Management Institute (2017) tailoring is necessary because each project is unique, but not every process, tool, technique, input, or output identified in PMBOK® Guide is required. To accomplish the objectives of this project and deliver a tailored PMBOK® Guide project management methodology for the research team at Gilbert Laboratory, the inputs, constraints, and resources available are going to be taking in account for the output of revised methodology to use it research project as shown in Figure 7. Based on these steps a project management methodology will be developed for Gilbert Laboratory in chapter 4.

1. INTRODUCTION

1.1 Background

Scientific research continuously strives to make discoveries, but there are so many hurdles throughout the process that lead to a higher probability of failure than success. For instance, a Principal Investigator or researcher produces an idea to test or design an experimental project to solve problems or find new applications. But like starting a project, this process requires many steps such as funding, systematic processing, standardized protocols-validated, quality controls, managing teams (PI, Postdocs, MDs, PhDs, graduate students, research associates, undergraduates, and staff administrators), communication throughout many programs (emails, meetings, sharing documents online and offline), sample collection, inventories, data analysis and storage as shown in Figure 1. All these moving pieces require a level of project management with the objective of minimizing avoidable mistakes from the beginning of the process in a controlled systematic environment by concentrating all the details in one place and allowing more effective traceability.

Figure 1 Multiple details to handle by a researcher

Note: Diagram shows the various details that a scientist project manager must manage for each scientific research project (Salas, 2021).

Although scientific research has done tremendous work throughout history, bringing many solutions to our community, the prominent level of work pressure while managing each research project is evident to anyone working in the research space. There is a significant amount of stress that each researcher and collaborator must handle to respond to the funding sponsor and ensure that science experiments go well, and even with their best efforts it is still likely that the first trials may not produce successful results.

Each scientist strives to do his or her best to accomplish the scope of the project, however, it is key to have all the resources and tools to make this happen with the highest rate of success possible. Seeking a solution to face these challenges is crucial because of

multidisciplinary projects in research laboratories and the variety of risk factors. In the case of the Gilbert Laboratory at University of California, San Diego, it is a highly interdisciplinary research lab involved in medical, environmental microbiology and biotechnology.

The ability to implement a methodology of project management to guide each researcher in the development of each project will be essential to producing results. The end goal is to help researchers to manage each project in a more fluid and effective way. Although the stress level may be part of the process regardless, having the right tools to tackle any challenges will allow the project manager to implement better decision making during the project.

1.2 Statement of the problem

Each research project requires a grant proposal that encompasses the project management development of the future experiment after grant approval. Then, upon project initiation, a project management methodology is required to work on the development of the research project with collaborators and sponsors, with the end goal of getting results within the scope of the project. Findings from some projects are scientifically published, some projects will progress to clinical trials and others enable the development of a biotechnology product. Even though research laboratories have been conducting projects ever since their inceptions, the Gilbert Laboratory, University of California, San Diego has never adopted any project management methodology.

This has caused mismanagement of projects such as poor workflow, miscommunication with collaborators, inconsistent planning, and poor traceability of projects that leads to a lower success rate of projects. While the laboratory has managed successful projects and publications, there have been others that were not as successful and led to a lot of lessons learned not only for Gilbert Laboratory, but also other research laboratories. Thus, the necessity to establish a project management methodology that could be used by researchers within the lab is evident. By adopting a project management methodology, Gilbert Laboratory seeks to utilize it as a single methodology for managing

projects within the organization. This will enable effective performance of projects within their time, budget, and scope constraints, in addition to desired quality results.

1.3 Purpose

In the scientific research community, such as in the Gilbert Laboratory, University of California, San Diego, managers must have a deep understanding of how to deal with interdisciplinary science projects involving multiple collaborators and sponsors as the stakeholders of each project. These multi-project laboratories must have not only grant writers, managers, and researchers, but also an operations structure and project management guidance to maintain traceability of all projects. The implementation of an agile methodology of project management is crucial to the success of all projects that have a profound impact on knowledge and discoveries for life science and our society.

The methodology proposed is based on the standard of Project Management Institute that would be the guidance for introducing a workflow and providing templates from the initiation of any project in the laboratory all the way to the end of the project. By implementing a structure guidance as a tool, this will allow not only traceability and collaboration of all details for each project's needs, but also it will allow project managers to manage multiple projects with ease based on the laboratory's need.

This will facilitate each research group to:

1. Standardize the project management methodology to apply across projects, allowing a more efficient workflow.
2. Improve communication across collaborators to permit delegation of roles during the project development.
3. Successfully deliver projects within the time, budget, scope, and quality constraints.
4. Increase the quality of results from each project.
5. Increase traceability of multiple projects.
6. Reduce the risk of project failure.

1.4 Objectives

1.4.1 General Objective

- To develop a project management methodology guide for scientific research to increase effectiveness and organization in projects for Gilbert Laboratory at University of California, San Diego.

1.4.2 Specific Objectives

- To identify the specific needs such as the lack of workflows and organization for multi-interdisciplinary projects within the laboratory.
- To propose a framework for standardizing projects and develop project templates and techniques to apply to the management of future scientific research projects.
- To describe how the proposed methodology works to ensure in-depth understanding of the methodology.
- To create a workflow plan to utilize the proposed methodology.

2. THEORETICAL FRAMEWORK

2.1 Company/Enterprise framework

Academic research laboratories are often under public or private universities umbrella. The principal investigator gets hired based on scientific publications and experience to lead research in a specific area field. In the case, University of California system has 10 different campuses across California, United States, and the Gilbert Laboratory belongs to University California, San Diego as shown in Figure 2. (The Parts of UC, 2020).

2.2 Company/Enterprise background

The University of California opened its doors in 1869. Today, the UC system includes more than 280,000 students and more than 227,000 faculty and staff. The UC system has contributed $46.3 billion to the California economy and around 430,000 jobs supported. The UC system also secures $7 in federal and private dollars for every $1 in research funding provided by the state of California. (*The UC System*, 2019). On each campus, there are thousands of research laboratories with renowned scientists in the scientific community worldwide. At University of California, San Diego, Professor Jack A. Gilbert earned his Ph.D. from Unilever and Nottingham University, UK, in 2002, and received his postdoctoral training at Queens University, Canada. From 2010 to 2018 he was Group Leader for Microbial Ecology at Argonne National Laboratory, a Professor of Surgery, and Director of The Microbiome Center at University of Chicago.

In 2019 he moved to University of California San Diego, where he is a Professor in Pediatrics Department and at the Scripps Institution of Oceanography. In 2019 he was elected to the Philosophical Society of Washington. He also co-authored “Dirt is Good” published in 2017, a popular science guide to the microbiome and children’s health. Dr. Jack A Gilbert serves on the board of the Genomic Standards Consortium and is the primary investigator for various research ventures, including the Earth Microbiome Project, the Home Microbiome Project, the Gulf Microbial Modeling Project, the Hospital Microbiome Project, and the Chicago River Microbiome Project. (Lab Members – Gilbert Lab, 2020.) The

laboratory name comes from the principal investigator as the leader for the research team, thus Gilbert Laboratory.

Figure 2 Location of Gilbert Laboratory, University of California, San Diego

Note: Location of the multiple University of California campuses and where the Gilbert Laboratory is located (Transferring to a UC, n.d).

2.3 Mission and vision statements

2.3.1 Mission

The mission of the laboratory is to operate basic and translational scientific research in the field of the Microbiome using cutting edge techniques, and to create a positive, supportive, and flexible working environment for all researchers.

The Gilbert Laboratory through scientific research is looking to answer fundamental questions about our microbial interaction with built environments, including what factors influence their microbial communities and how microbes are transferred throughout these environments, which are included in medical, animal, human and environmental implications.

2.3.2 Vision

Gilbert laboratory is a highly interdisciplinary research laboratory involved in medical, environmental microbiology and biotechnology development. Each research project requires a grant proposal that encompasses the project management development of the future experiment after grant approval.

Adopting a project management methodology allows Gilbert Laboratory to improve their organizational components, effectively allocate their resources, encourage compliance by the organization and improve internal and external communication. It will further improve, and where lack of, introduce, components for sustainable execution of projects, leading to improved prosperity for each research project.

2.4 Organizational Structure

The Gilbert laboratory through scientific research is looking to answer fundamental questions about our microbial interaction with built environments, including what factors influence their microbial communities and how microbes are transferred throughout these environments, which are included in the medical, animal, human and environmental implications. All of these are possible with a team. Gilbert Laboratory is under the University California system; thus, it follows the hierocracy established by the UC system from board of directors to the president who represents the UC San Diego campus, and from that there are schools divided by departments.

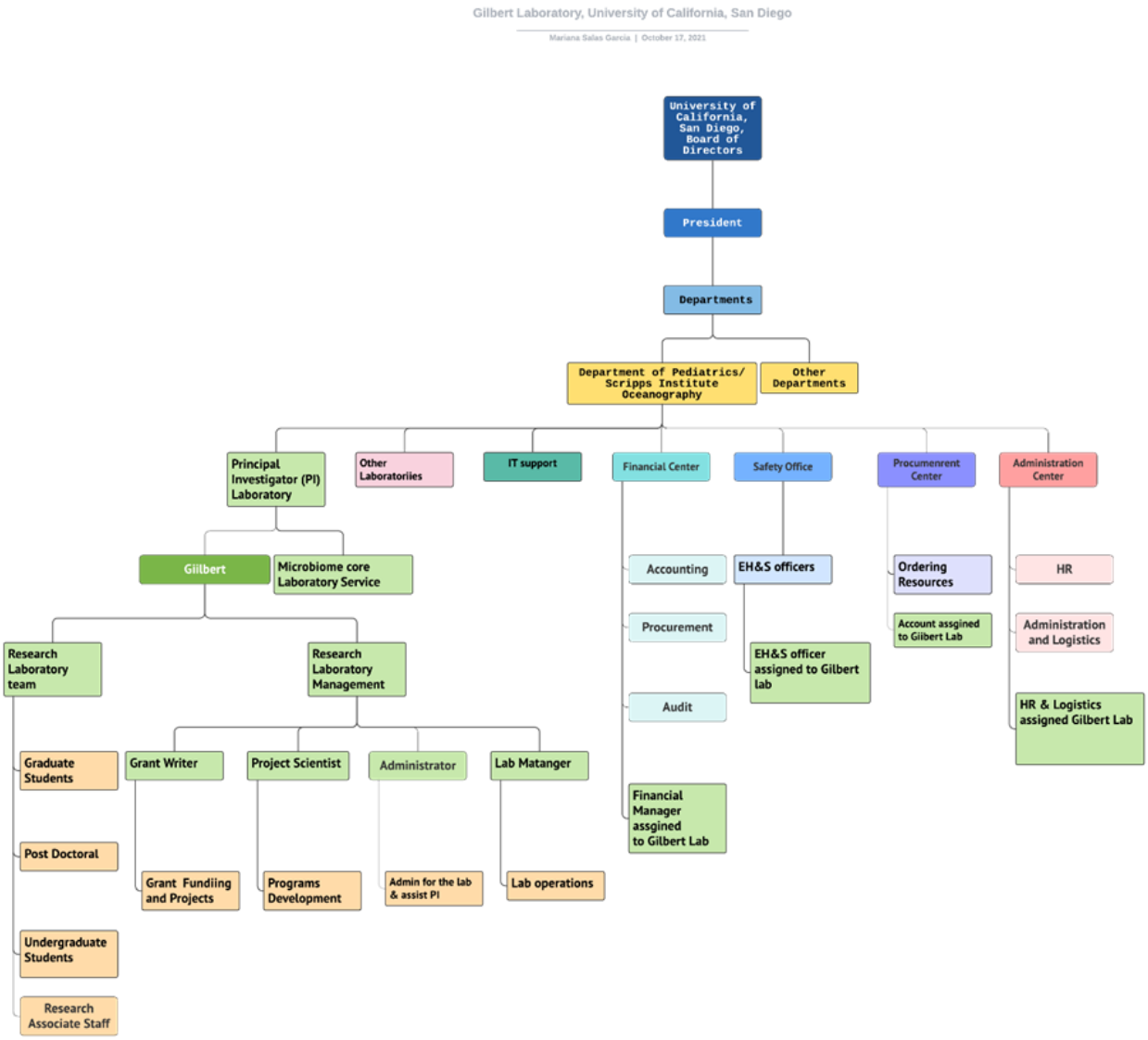
The Gilbert Laboratory falls under the Department of Pediatrics, which is part of the Health Science School, as well as Scripps Institute of Oceanography. Different operational offices exist throughout these two departments where the laboratory operations occur. These include the safety office which keeps the laboratory in compliance with all safety protocols for the laboratory and team members, the administration center with human resources for all employee benefits and regulations, the IT/support for all the electronic systems involved in daily operation, the financial office, which creates the accounts for the laboratory and audits

the grants coming in and out, and the procurement office where all laboratory and equipment supplies are obtained for different resources needed in each laboratory.

Each laboratory on campus acts as its own organization or nonprofit business because it has its own team for daily operations which works across the other department offices. However, the projects that start in the laboratory are up to the principal investigator (PI) as a leader. The PI has a management team that helps push the laboratory's ongoing projects forward. The project scientist helps create programs, assists with project proposals, and supports students and researchers in their projects. The laboratory manager oversees and supports the daily operations of the lab such as project resources, experiments, and data management for researchers.

The administrator coordinates and plans events of the laboratory while acting as a bridge to the other offices on campus. The grant writer supports the principal investigator in creating strategies and project proposals for funding. The financial manager keeps the teams accountable for the cashflow in and out of the laboratory and executes the movement of grant funding into the laboratory. This management team supports the research projects in every phase for each researcher to fulfil the scope of their project as shown in Figure 3.

Figure 3 Organizational Structure Gilbert Laboratory within University of California, San Diego



Note: General overview of the organizational structure of Gilbert laboratory within the University of California, San Diego and shows all the stakeholders that a project could demand (Salas, 2021).

2.4.1 Products Offered

Gilbert Laboratory looks to execute basic and translational scientific research in the field of the Microbiome using innovative techniques, and to create a positive and supportive, flexible working environment for all employees and students. The laboratory works with different stakeholders in each individual project, and the number of stakeholders in any given project can vary greatly. For instance, a graduate student works on his or her own research project proposal, but he or she gets funding from the University, a collaborator, a donor, or a company. This scenario shows how a research project can contain many stakeholders; thus, the project manager must maintain an effective workflow of the project from beginning to end.

To fulfil each research project as the laboratory grows and the laboratory involves more researchers, there is a need for a workflow that allows all participants to be on the same page within the laboratory research project. Part of this final project graduation is:

1. To propose a framework for standardizing projects based on the specific needs of scientific research.
2. To develop project templates and techniques to apply to the management of future scientific research projects.
3. To describe how the proposed methodology works to ensure in-depth understanding of the methodology.
4. To create a workflow plan to utilize the proposed methodology.

The end goal is that the Gilbert laboratory can use the methodology in combination with its scientific research experience and serve as an example for other academic and industrial laboratories that there is an agile manner to implement project management.

2.5 Project Management concepts

2.5.1 Project & Life Cycle

Project Management Institute (2017) describes a project as a temporary endeavor with beginning and end to create a unique product, service, or result. Projects can be classified as unique, temporary, and even as a project that drives change.

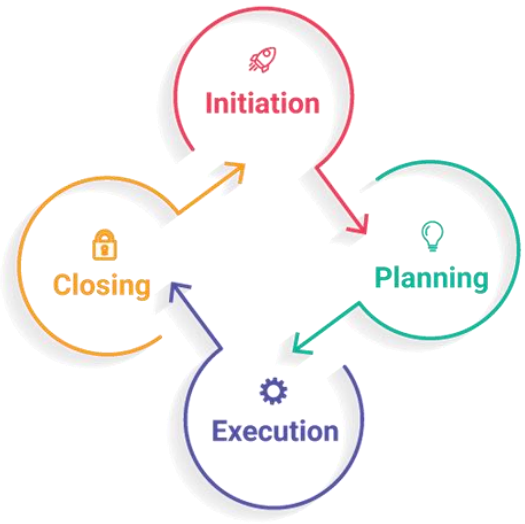
- Unique products, services, or results are based on fulfilling objectives and deliverables accordingly. For instance, a research project that can be used to determine the correlation of a trend or a biological process that will benefit society. Although projects are unique, a project can involve a single or multiple organizations.
- Temporary endeavor means to have a definite date to start and end. Even though the project can last years, the key is that it has a definite end date. Projects are temporary, but their deliverables might continue beyond the end of the project. For instance, a project of developing a type of medical treatment will eventually end, however the useability of the medical treatment will create a deliverable expected to last for decades or beyond.
- Projects drive change in organizations. Some projects are used for moving an organization from its current state to another state to accomplish a specific objective.

2.5.2 Project Initiation Context

There are fundamentals that organization leaders need to initiate projects such as meeting regulatory requirements, satisfying stakeholders' requests, creating, or improving a product, process, or service, or implementing changes to business or technological strategies.

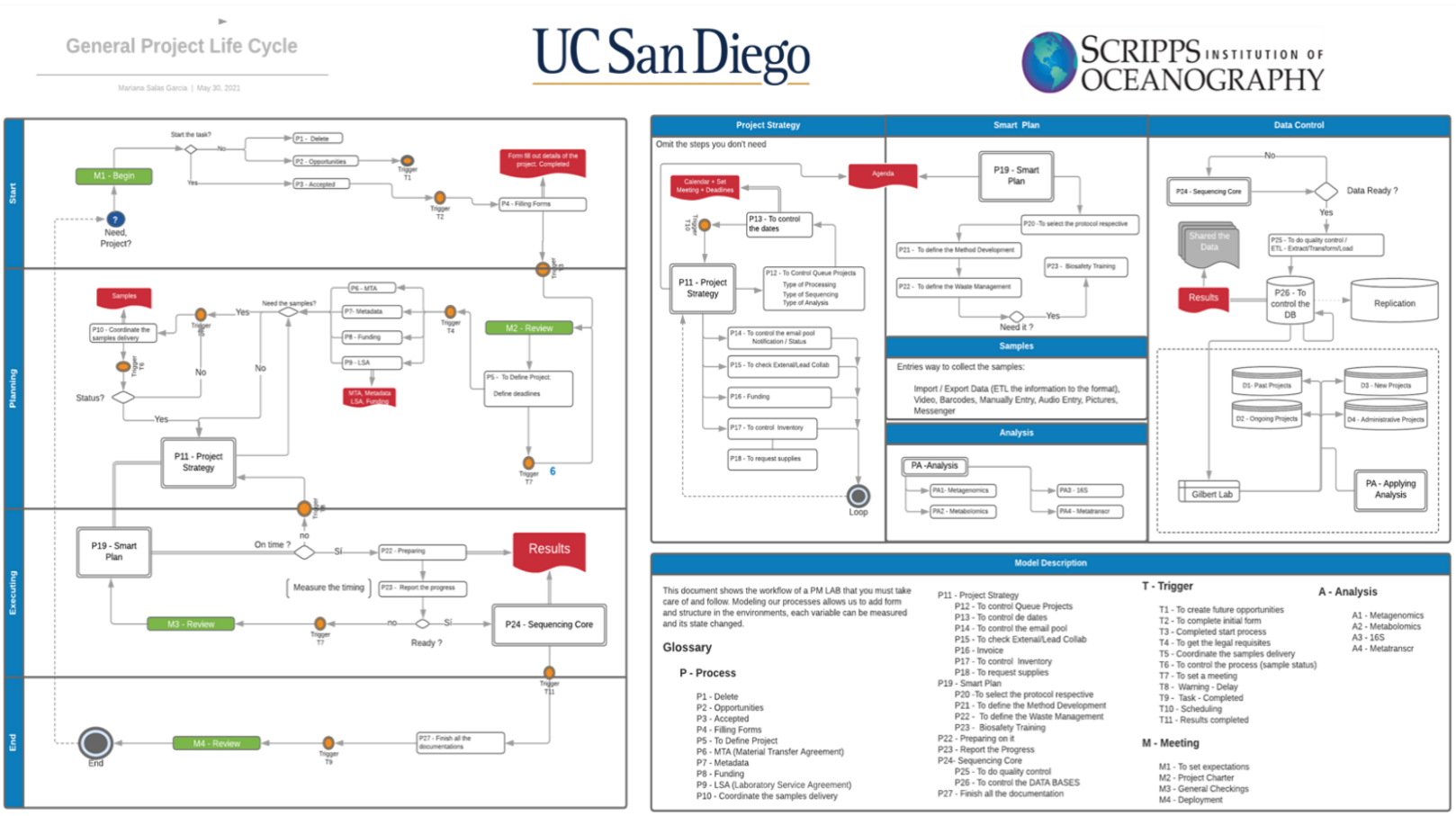
In this case, in academic research the constant creation of projects starts with a grant proposal where the sponsor would choose from all proposals which research team would take on the project. Thus, if a project is funded in the laboratory, then the principal investigator and research team start the project. The typical life cycle of a grant-funded project is demonstrated in Figure 4. A more in-depth project life cycle is shown in Figure 5.

Figure 4 Project Life Cycle



Note: The general phases of a project life cycle when a research project starts in the laboratory (Salas, 2021).

Figure 5 Depth project cycle in the laboratory



Note: The complex life cycle process of project management in the laboratory and all the details that require each phase from beginning to end (Salas, 2021).

2.5.3 Project management processes

Project Management has been described as a purpose management tool for projects to allow successful project completion and the satisfaction of the project stakeholders, bearing in mind the constraints of defined scope, desired quality, budgeted cost, and a schedule deadline. Any project contains risks and constraints which are limiting factors that affect the execution of the project (Project Management Institute, 2017).

Thus, the utilization of the project management process will allow a manager to review all constraints and assumptions and write them down so all stakeholders will be aware. The key aspect is to check all these factors that can impact a project, which allows each project manager more control over the project and plan of execution.

According to the Project Management Institute (2017), project management is achieved by forty-seven logically grouped project management processes, which are grouped into five Process Groups represented in Chart 1 below. The way Gilbert Laboratory is now using the process groups for the research project is shown in Figure 6 and Figure 7.

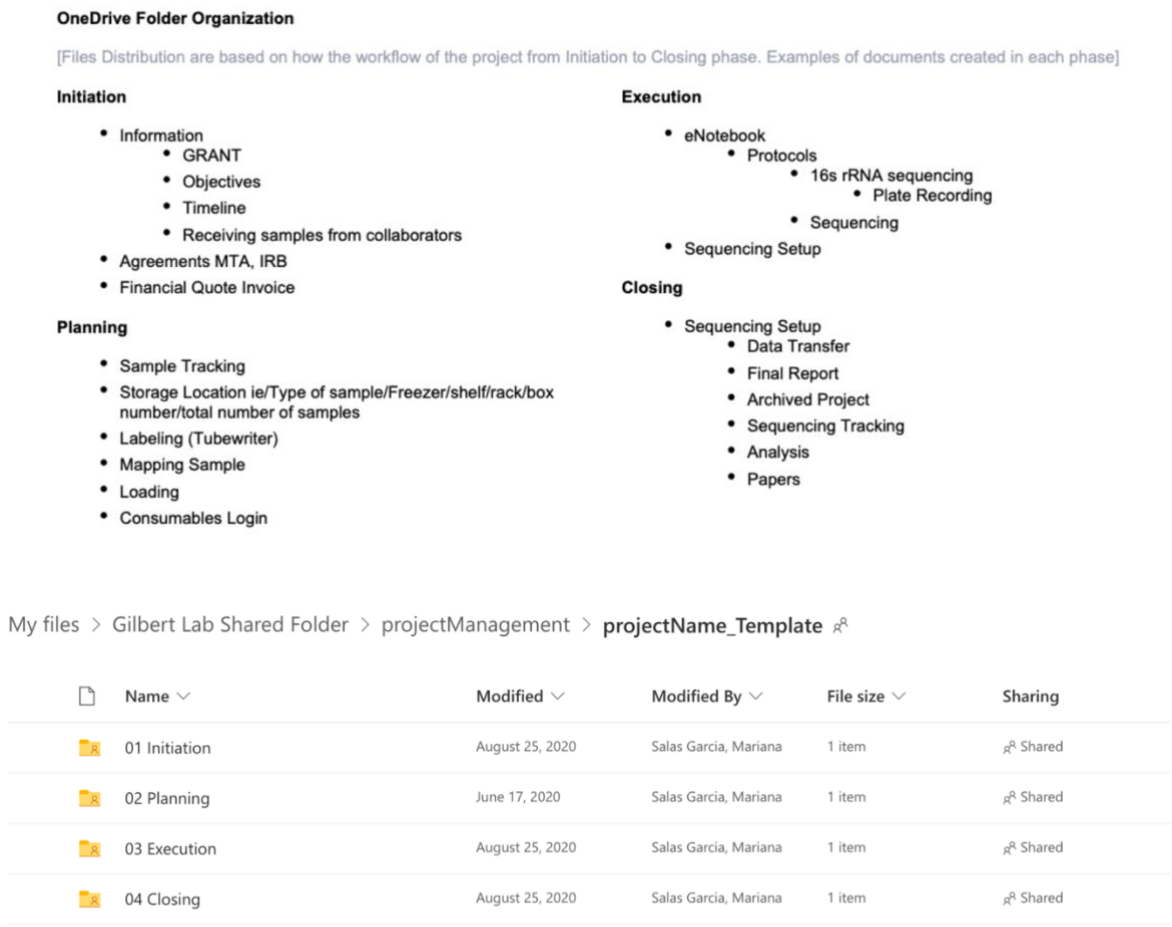
Chart 1 Process Groups in a Project

Process Groups	Inputs & Outputs for each process
Project initiation	oAuthorization of new project oSelection resource limits oRecognizing the benefits of the project oDescribe initial requirements, assumptions, risks, constraints, stakeholders, and existing agreements oSelect project manager oDevelop project charter oAssess project feasibility oCreate deliverable objective
Project planning	oCreate project scope statement oEstimate work requirements, quality and quantity of work and resources needed. oEstimate time and develop schedule oEvaluation of the various risks oGain formal approval
Project execution	oAcquire project team members oExecute the work or experiments
Project monitoring & control	oMeeting minutes oTrackand analyze project progress, compare with predicted outcome oRequest, approve or reject changes
Project closure	oCompile of the documents oContractual closure of the contract oFinancial closure of the charge numbers oAdministrative closure of the paperwork

Note: The table shows the inputs and outputs for each group process based on the phase (Salas, 2021).

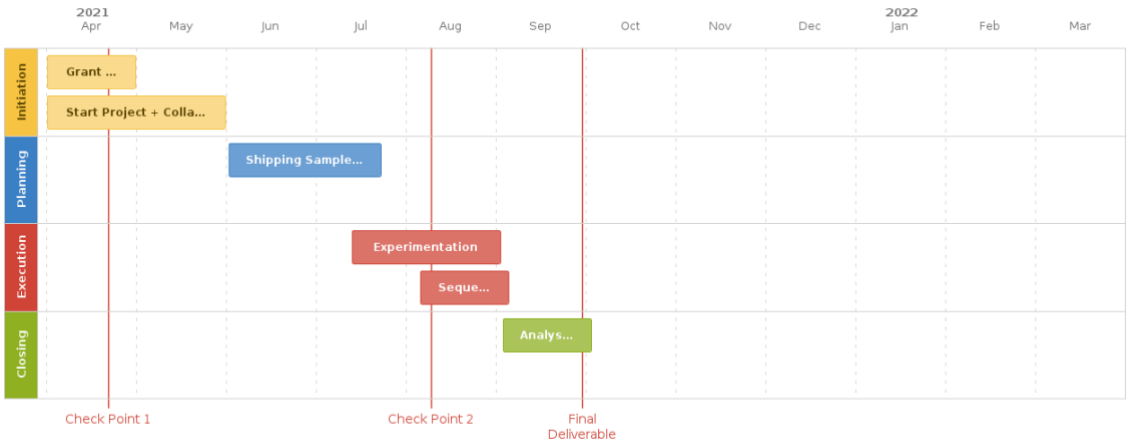
Gilbert Laboratory does distinguish between the four Process Groups except for one monitoring as phase. The monitoring and control can be part of meeting reviews and follow-ups. However, the notion that each process group can repeat itself multiple times within the projects is unfamiliar territory. Thus, it is essential to clarify how this is possible and the best way to utilize it.

Figure 6 Process Groups of Gilbert Laboratory Organization



Note: The figure shows the file system based on process groups of the Gilbert Laboratory, where the initiation contains documents such as the proposal of the project such as grand funding, objectives, and any agreement between the collaborators. The planning process contains documents of sample tracking, location of samples, organization of all samples to prepare to create an experiment. The execution process has the protocols ready to execute, start all the experiments and data collection as outputs. The closing process contains all the results from the experiments or protocols and creates the final analysis of the data created and presented as a report (Salas, 2021).

Figure 7 Roadmap planner based on the process groups



Note: Throughout all the processes there is a timeline to follow when the project starts until the deadline for the final deliverable. The Gilbert Laboratory has multiple projects which are key to show on a roadmap for keeping the organization clear across projects (Salas, 2021).

2.5.4 Project management knowledge areas

Process groups are knowledge areas that are categorized based on requirements such as component processes, practices, inputs, outputs, tools, and techniques. The ten knowledge areas that are most used are:

2.5.4.1 Project Integration Management.

Chart 2 Integration Management Process

Process group	Project Integration Management Process
Initiating Process Group	**Develop Project Charter**
Planning Process Group	**Develop Project Management Plan**
Executing Process Group	**Direct and Manage Project Work**

Monitoring and controlling Process Group	**Monitor and Control Project Work**
Monitoring and controlling Process Group	**Perform Integrated Change Control**
Closing Process Group	**Close Project or Phase**

Note: Includes the best practices to integrate activities withing the Project Management Process Groups.

2.5.4.2 Project Scope Management.

Chart 3 Scope Management Process

Process group	Scope Management Process
Planning Process Group	**Plan Scope Management**
Planning Process Group	**Collect Requirements**
Planning Process Group	**Define Scope**
Planning Process Group	**Create WBS**
Monitoring and controlling Process Group	**Validate Scope**
Monitoring and controlling Process Group	**Control Scope**

Note: Includes all the work required and specific aims.

2.5.4.3 Project Time Management.

Chart 4 Time Management Process

Phase group	Time Management Process
Planning Process Group	**Plan Schedule Management**
Planning Process Group	**Define Activities**
Planning Process Group	**Sequence Activities**
Planning Process Group	**Estimate Activity Resources**
Planning Process Group	**Estimate Activity Durations**
Planning Process Group	**Develop Schedule**
Monitoring and controlling Process Group	**Control Schedule**

Note: Process required to achieve deliverables of the project within scheduled time.

2.5.4.4 Project Cost Management.

Chart 5 Cost Management Process

Process group	Cost Management Process
Planning Process Group	**Plan Cost Management**
Planning Process Group	**Estimate Cost**
Planning Process Group	**Determine Budget**
Monitoring and controlling Process Group	**Control Cost**

Note: Process required to an approve budget with the estimate cost control to complete the project.

2.5.4.5 Project Quality Management.

Chart 6 Quality Management Process

Process group	Quality Management Process
Planning Process Group	**Plan Cost Management**
Executing Process Group	**Perform Quality Assurance**
Monitoring and controlling Process Group	**Control Quality**

Note: Process to perform and control quality policies, and objectives to meet the needs for which the project was undertaken and stakeholders' expectations.

2.5.4.6 Project Resource Management.

Chart 7 Resource Management Process

Process group	Human Resource Management Process
Planning Process Group	**Plan Resource Management**
Executing Process Group	**Acquire Project Supplies and team**

Note: Process that organizes, manages, and acquires resources for the project.

2.5.4.7 Project Communications Management.

Chart 8 Communications Management Process

Process group	Communications Management Process
Planning Process Group	**Plan Communication Management**
Executing Process Group	**Manage Communications**
Monitoring and controlling Process Group	**Control Communications**

Note: Processes required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring, and the ultimate disposition of project information.

2.5.4.8 Project Risk Management.

Chart 9 Risk Management Process

Process group	Risk Management Process
Planning Process Group	**Plan Risk Management**
Planning Process Group	**Identify Risk**
Planning Process Group	**Perform Qualitative Risk Analysis**
Planning Process Group	**Perform Quantitative Risk Analysis**

Planning Process Group	Plan Risk Responses
Monitoring and controlling Process Group	Control Risks

Note: Process to conduct risk planning, identification, analysis, response planning and control on a project.

2.5.4.9 Project Procurement Management.

Chart 10 Procurement Management Process

Process group	Procurement Management Process
Planning Process Group	Plan Procurement Management
Executing Process Group	Conduct Procurements
Monitoring and controlling Process Group	Control Procurements
Closing Process Group	Close Procurements

Note: Processes to purchase or acquire products, services or results needed from outside project.

2.5.4.10 Project Stakeholder Management.

Chart 11 Stakeholder Management Process

Process group	Stakeholder Management Process
Initiating Process Group	Identify Stakeholders
Planning Process Group	Plan Stakeholders Management

Executing Process Group	**Manage Stakeholder Engagement**
Monitoring and controlling Process Group	**Control Stakeholder Engagement**

Note: Process required to identify and manage people, groups or organizations that could impact or be impacted by the project.

2.10 Concepts of Project Management and How to Create a Methodology

2.10.1 Terminology and correlation with project performance

Research projects including clinical research involve a huge supply of resources, manpower, energy, effort, and time to acquire the desired outcome. Madhukiran Parvathaneni, PhD from Harrisburg University of Science and Technology stated that "utilization of the project management methodologies along with the conventional techniques would increase the chances of execution of clinical trials in a much cost and resource effective and time-efficient manner." (Parvathaneni, 2017) The standardization of workflow in research teams is a key element to managing each project.

Thus, referring to the concept of standard is often driven by best practices within a discipline and frameworks are the guideline on how to do it. Currently, there are multiple methodologies that are applied based on the need of the organization. A few to mention are Agile, waterfall, lean, Organizational Project Management Methodology (OPM Methodology), Projects in Controlled Environments, version 2 (Prince2) and Earned Value project management (EVM).

2.10.2 Creating or Tailoring project management methodology

There are often as many methods to manage as there are projects, but they all share one thing in common: getting deliverables done on time and within budget, no matter which methodology the organization chooses to control its project (Project Management Methodologies - An Overview, 2017). To start a new methodology from zero would take a lot of time, and if it is needed for the specific organization then it might be valuable to do so.

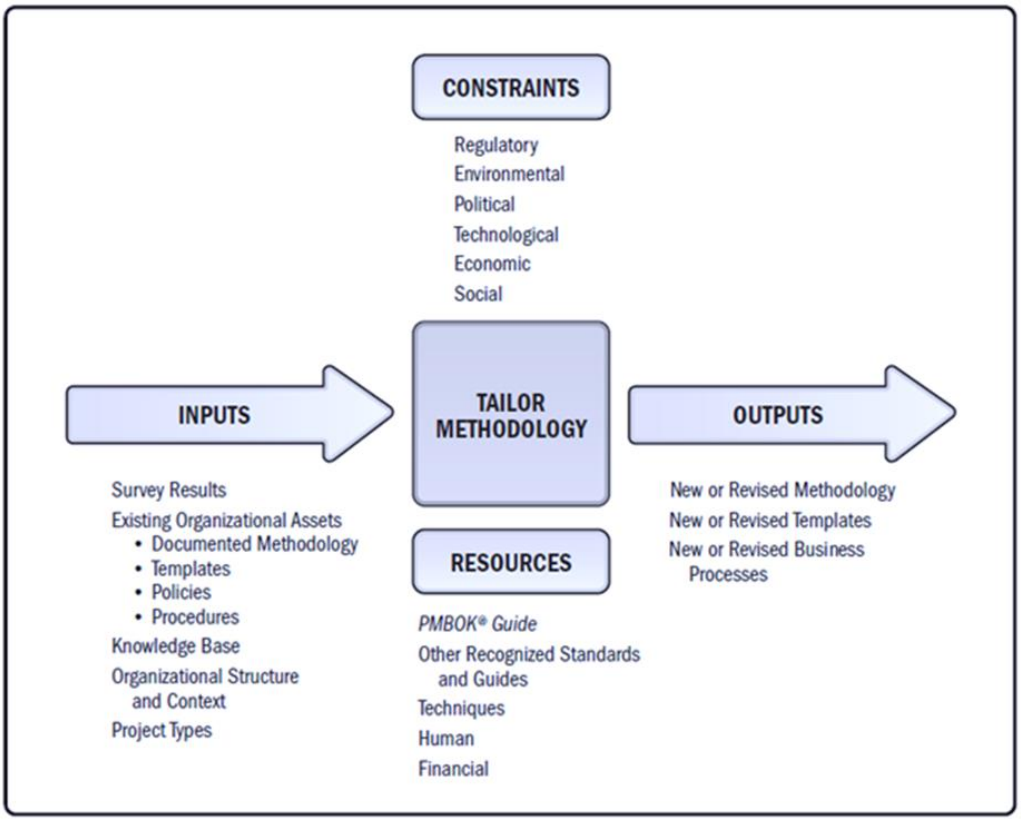
However, when working with scientific research projects, the different research areas and collaborators across disciplines are constant.

If the methodology created is too structured and it only applies in that area, then this might have a reserve impact of what it is intending to do. To establish the right methodology for an organization besides knowing the requirements, an alternative is to adopt the most suitable portions of the methods into one, which is called tailoring a project management methodology. For this project's purpose and the time constraints of the graduation, a project management methodology will be tailored based on established guidelines of PMBOK® Guide as represented in Figure 8.

According to Project Management Institute (2017) tailoring is necessary because each project is unique, and not every process, tool, technique, input, or output identified in PMBOK® Guide is required. To accomplish the objectives of this project and deliver a tailored PMBOK® Guide project management methodology for the research team at Gilbert Laboratory, the inputs, constraints, and resources available are going to be taken in account for the output of a revised methodology to be used for research projects as shown in Figure 5.

Based on these steps a project management methodology will be developed for Gilbert Laboratory in chapter 4**.**

Figure 8 The Methodology Tailoring Process



Note: PMBOK® Guide shows the workflow of inputs, constraints, resources to tailor methodology and outputs such as creating revised methodology, templates and or business processes ("Developing a Tailored Project Management Methodology," 2016).

3. METHODOLOGICAL FRAMEWORK

3.1 Information Sources

Information can come in many ways, especially today due to increased accessibility to various sources such as social media, internet, TV, virtual newspapers and in many forms such as observations, videos, documents, pictures, speeches, and organizations. There are types of sources such as primary and secondary. Below are the detailed definitions of both ("Sources of Information," 2018).

3.1.1 Primary Sources.

Primary sources come from formal documentary information sources and are the first research and publication available to describe new knowledge. For instance, books, research reports, thesis, patents, and others ("Sources of Information," 2018).

The primary sources used for this final graduation project are

- Research in project management in clinical trials or scientific research
- Report on scientific projects that have used project management methods

An overview of the objectives and their primary sources are presented in Chart 12.

3.1.2 Secondary Sources.

Secondary sources also come from the formal documentary information source and are compilation of the primary sources such as a literature review, index, encyclopedia, or manual ("Sources of Information," 2018).

Secondary sources used for this final graduation project are:

- A Guide to Project Management Body of Knowledge
- Literature reviews on project management methodology and applied in scientific research
- Relevant documentation obtained from Gilbert Laboratory, San Diego

An overview of the objectives and its secondary sources are presented in Chart 12

Chart 12 Information Sources

Objectives	Information sources	
	Primary	**Secondary**
1. To propose a framework for standardizing projects based on the specific needs of scientific research.	Research in project management in clinical trials or scientific research	A Guide to Project Management Body of Knowledge
2. To develop project templates and techniques to apply to the management of future scientific research projects.	Research in project management in clinical trials or scientific research	Literature reviews on project management methodology and applied in scientific research
3. To describe how the proposed methodology works to ensure in-depth understanding of the methodology.	Report on scientific project that has used project management methods	A Guide to Project Management Body of Knowledge

4. To create a workflow plan to utilize the proposed methodology.	Report on scientific project that has used project management methods	Relevant documentation obtained from Gilbert Laboratory, San Diego

Note: Based on each objective proposed there are different information sources to consult between primary and secondary to research about how to develop a methodology. (Salas, 2021)

3.2 Research Method

Research methods start from designing a study that is composed of information sources. Research methods can be determined quantitively or qualitatively, whichever would best serve the completion of the project. The four kinds of research methods are surveys, experiments, field research, and secondary data and textual analysis (Little, 2014). For this final graduation project, the chosen research method is interviews and literature reviews.

3.2.1 Survey - Interview method

An interview allows for a conversation between the researcher and the interviewee by conducting a survey of the topic (Little, 2014). This way the information compiled comes from the answers from the interviewee. There are no right or wrong answers.

3.2.2 Literature reviews method

A scientific literature review allows the compilation of knowledge from different research studies. It also provides transparency within the field as it requires peer-review. Thus, the key aspect of literature reviews is to have an overview or synthesis of the scientific methods (Little, 2014).

An overview of the objectives and their secondary sources are presented in Chart 13.

Chart 13 Research Methods

Objectives	**Research methods**	
	Survey Interview method	Literature reviews method
1. To propose a framework for standardizing projects based on the specific needs of scientific research.	This method is to obtain feedback and based on the understanding to create a standardization.	This method is used to select appropriate literature and extract the necessary information.
2. To develop project templates and techniques to apply to the management of future scientific research projects.	This method is used to get feedback and assess views, and experience in this area.	This method is used to select appropriate literature and extract the necessary information. Based on that to create templates.
3. To describe how the proposed methodology works to ensure in-depth understanding of the methodology.	This method is used to communicate, obtain feedback and approval.	This method is used to develop concepts in the field and workflows.

4. To create a workflow plan to utilize the proposed methodology	This method is used to communicate, obtain feedback and approval.	This method is used to develop concepts in the field and workflows.

Note: Based on the objectives, it's key to consult the stakeholders in order to hear what their pains are while doing project management and research through literature about what types of methodologies has been used or what are the needs that the scientific area needs. (Salas, 2021)

3.3 Tools

PMBOK® Guide describes different types of tools for each project management knowledge area. The tools are describing a collection of information media. For this project, the following tools are employed:

3.4 Interactive communication

According to Project Management Institute (2017), interactive communication is communication between two parties performing a multidirectional exchange of information. It is considered the most effective way to ensure mutual understanding on a specific topic and can include meetings, phone calls, instant messaging, etc. (Project Management Institute, 2017).

3.5 Expert judgement

Expert judgement is defined as judgement provided based on expertise in an application area. The expert will describe the best process that could be applied in the area (Project Management Institute, 2017).

3.6 Project Management information system

Provides a set of standard tools for the project management to capture, store and distribute internal or external information for communication plans (Project Management Institute, 2017).

Identified tools to achieve specific objectives are presented in Chart 14

Chart 14 Tools to Achieve Specific Objectives

Objectives	**Tools**
1. To propose a framework for standardizing projects based on the specific needs of scientific research.	The tools defined in the *PMBOK Guide:* Interactive communication Expert judgement Project Management information system
2. To develop project templates and techniques to apply to the management of future scientific research projects.	The tools defined in the *PMBOK Guide:* Interactive communication Expert judgement Project Management information system
3. To describe how the proposed methodology works to ensure in-depth understanding of the methodology.	The tools defined in the *PMBOK Guide:* Interactive communication Expert judgement Project Management information system
4. To create a workflow plan to utilize the proposed methodology	The tools defined in the *PMBOK Guide:* Project Management information system

Note: To fulfill the objectives, there is a need to have the right tools or resources and the chart explains what those are. (Salas, 2021)

3.7 Assumptions and constraints

Project Management Institute (2017) defines an assumption as a factor that is expected to happen during the project development, and it is key to consider it during the planning phase of the project. Constraints are limiting factors that could affect the execution of the project and are part of the triple constraint called scope, time, and cost (Management Institute, 2017).

The constraints and assumptions are summarized in Chart 15.

Chart 15 Assumptions and Constraints

Objectives	Assumptions	Constraints
a. To propose a framework for standardizing projects based on the specific needs of scientific research.	All information is available to put it into practice from already done methodologies	The 3 months could create delays in analyzing everything available.
b. To develop project templates and techniques to apply to the management of future scientific research projects.	All information is available to put it into practice from already done methodologies	The 3 months could create delays in analyzing everything available

c. To describe how the proposed methodology works to ensure in-depth understanding of the methodology.	All information is available to put it into practice from already done methodologies	The 3 months could create delays in analyzing everything available
d. To create a workflow plan to utilize the proposed methodology	All information is available to put it into practice from already done methodologies. The laboratory has an idea of their project workflow.	The 3 months could create delays in analyzing everything available

Note: While developing projects there are assumptions and constraints that can happen as foreseeable events and they are described above (Salas, 2021).

3.8 Deliverables

Deliverables are results that are produced to complete a process during the project development and the completion of each, based the scope of the project, will determine the accomplishment of the project (Project Management Institute, 2013). Chart 16 compiles the list of deliverables that will be generated for the various specific objectives.

Chart 16 Deliverables

Objectives	Deliverables
1. To propose a framework for standardizing projects based on the specific needs of scientific research.	Proposed scientific research framework for standardizing projects based on the needs identified.

2. To develop project templates and techniques to apply to the management of future scientific research projects.	Project management templates for Gilbert Laboratory.
3. To describe how the proposed methodology works to ensure in-depth understanding of the methodology.	Description on how to apply the proposed methodology
4. To create a workflow plan to utilize the proposed methodology	A workflow plan for the Gilbert Laboratory

Note: Deliverables create specific tasks for each objective and the outputs expected (Salas, 2021).

4. RESULTS

4.1 Project Charter

The project charter describes in a summarized manner how the methodology of SRPMM has been developed and key deliverables to accomplish each objective as shown in chart 17 (Project Management Institute, 2017).

Chart 17 Project Charter

PROJECT CHARTER	
Date	**Project Name:**
Issue date: 15 May 2021	The development of a Project Management Methodology guide for scientific research in Gilbert Laboratory, University of California, San Diego.
Knowledge Areas / Processes	**Application Area (Sector / Activity)**
Knowledge areas: Project Integration Management, Project Scope Management, Project Time Management, Project Cost Management, Project Quality Management, Project Human Resource Management, Project Communications Management, Project Risk Management, Project Procurement Management and Project Stakeholders Management. **Process groups:**	Scientific Research in academia and industry 1. Scientific research and development 2. Grant proposals 3. Clinical trials

Initiating, Planning, Executing, Monitoring & Controlling and Closing.	
Start date	**Finish date**
Same as the issue date	February 23rd, 2023

Project Objectives (general and specific)

General objective:

To develop and implement a project management methodology guide for scientific research at Gilbert Laboratory, University of California, San Diego to increase traceability for all new projects and create an effective multi-interdisciplinary projects portfolio.

Specific objectives:

1. To identify the specific needs such as the lack of workflows and organization for multi-interdisciplinary projects within the laboratory.
2. To propose a framework for standardizing projects and develop project templates and techniques to apply to the management of future scientific research projects.
3. To describe how the proposed methodology works to ensure in-depth understanding of the methodology.
4. To create a workflow plan to utilize the proposed methodology.

Project purpose or justification (merit and expected results)

In the scientific research community, such as in the Gilbert Laboratory, University of California, San Diego, managers must have a deep understanding of how to deal with multi-interdisciplinary science projects involving multiple collaborators and sponsors as the stakeholders of each project. These multi-project laboratories must have not only grant writers, managers, and researchers, but also an operations structure and project management guidance to maintain traceability of all projects. The implementation of an agile methodology of project management is key to the success of all projects that

ultimately have a profound impact in knowledge and discoveries for life science and our society. The methodology proposed is based on the standard of Project Management Institute that would be the guidance for introducing a workflow and providing templates from the initiation of any project in the laboratory all the way to the end of the project. By implementing a structure guidance as a tool, this will allow not only traceability and collaboration of all details for each project's needs, but also it will allow project managers an easier way to manage multiple projects in many cases based on the laboratory's need.

Assumptions
The methodology will allow a workflow for project management in the laboratory The projects will be delivery based on deadlines agreed in the project charter All resources available will be used to develop the methodology
Constraints
Reviewers must check each project deliverable in a timely manner allowing time for corrections Balancing work and the developing of this project
Preliminary risks
If the project manager or supervisory support gets sick while developing this project during worldwide pandemic and project deliverables are delayed. If reviewers have multiple projects to review, feedback and deliverables could be delayed. If supervisory support has multiple projects to review, the quality of feedback and overall final quality of the project could be impacted
Budget

Not defined yet

Milestones and dates

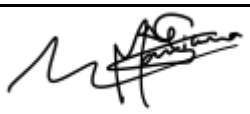
Task Name	Start	Finish
Final Graduation Project	Mon 9/19/22 8:00 AM	Fri 2/3/23 5:00 PM
FGP Start	Mon 9/19/22 12:00 AM	Thu 2/2/23 5:00 PM
1, Graduation Seminar	Mon 5/10/21 8:00 AM	Fri 6/11/21 5:00 PM
2, Tutoring process	Mon 9/19/22 8:00 AM	Wed 11/23/22 5:00 PM
3, Reading by reviewers	Mon 12/12/22 12:00 AM	Mon 1/9/23 12:00 AM
4,Adjustments	Thu 1/19/23 12:00 AM	Mon 1/23/23 5:00 PM
5,Presentation to Board of Examiners	Mon 1/23/23 12:00 AM	Thu 2/2/23 5:00 PM
FGP End	Thu 2/2/23 8:00 AM	Thu 2/2/23 8:00 AM

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

Project Management Methodology guide will serve as a template for guidance for each project phase from initiation, planning, execution, monitoring, controlling, and closing for the scientific research within Gilbert laboratory, University of California, San Diego.

Relevant historical information

The Gilbert Laboratory at UCSD is a highly interdisciplinary research lab involved in medical, environmental microbiology and biotechnology development. Each research project requires a grant proposal that encompasses the project management development of the future experiment after grand approval. Then, upon project initiation, a project management methodology is required to work on the development of the research project with collaborators and sponsors with the end goal of getting results within the scope of the project. Ultimately, findings from some projects are scientifically published, some projects will progress to clinical trials and others will enable the development of a biotechnology product.
Stakeholders
Direct stakeholders: Course Facilitator Academic Assistant Project Review Board Tutor Indirect stakeholders: Classmates

Project Manager: Mariana C Salas Garcia	**Signature:** 
Authorized by:	**Signature:**

Note: Formalizes the project start and confers the project manager with the authority to assign company resources to the project activities. The project charter provides a clear start and well-defined project boundaries (Salas, 2021).

4.1.1 Scope Statement

The scope statement defines all the elements require to accomplish all objectives and a way measure the success of the project, which they are presented below for the development of SRPMM (Project Management Institute, 2013).

4.1.1.1 Scope Description.

The Project Management Methodology guide for scientific research in Gilbert Laboratory, University of California, San Diego will be developed and implemented for in the upcoming and all the projects in the portfolio of the laboratory that is working on. Further, there are going to be interviews with members of the laboratory to understand the needs of project management that the teams need or must improve. The overall goal is after identifying the needs then a set of templates will be added in the workflow of project management to implement across all projects and create a system for working in projects.

4.1.1.2 Deliverables.

- Identify the specific needs for project management for all multi-interdisciplinary projects within the laboratory.
- Create a framework for standardizing projects and develop project templates and techniques to apply to the management of future scientific research projects.
- Describe how the proposed methodology works to ensure in-depth understanding of the methodology.
- Create a workflow plan on how to implement the proposed methodology.

4.1.1.3 Acceptance Criteria

The project will be accepted when the tutor reviewer agrees to accomplish all the deliverables and signs off. The implementation of the methodology in a real research project to prove the usability for all the templates while executing the project.

4.1.1.4 Constraints

The project manager has also full-time plus other business to manage while developing this project, thus must require time management and good communication with the tutor. The tutor reviewer also has other commitments, which the time of reviewing would depend upon availability.

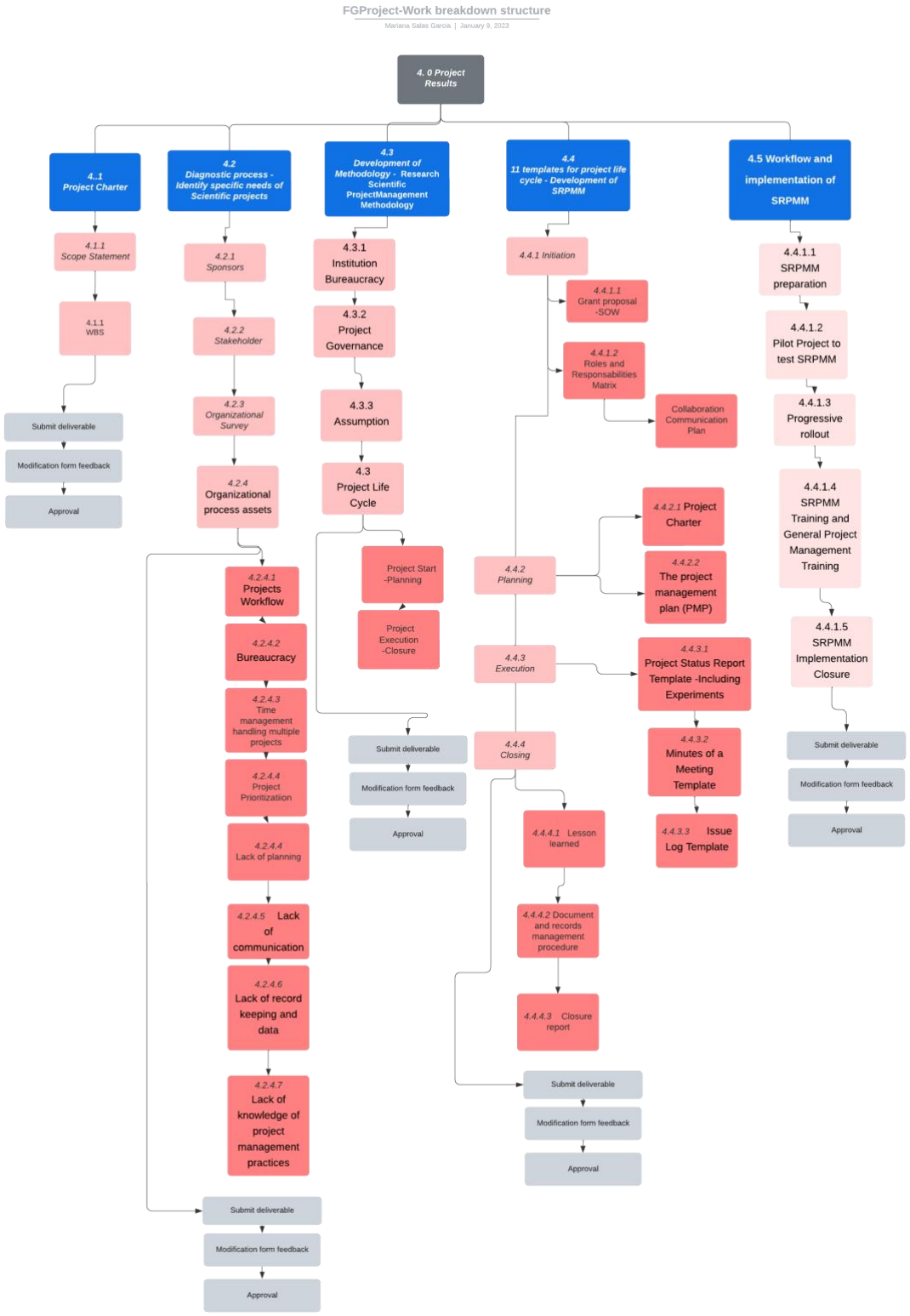
4.1.1.5 Assumptions

The project manager and tutor would work together to get the project finalized and the highest standard.

4.1.2 Methodology Work Breakdown

The methodology work breakdown shows how each activity is performed and the final deliverables as an output for the final product of the project (Project Management Institute, 2017). In this case, the results are responding to each specific objective of the development and implementation of the methodology.

Figure 9 FGP Work breakdown structure



Note: FGP work breakdown structure allows a clear overview of the tasks based on the

objectives and deliverables to finalize the project (Salas, 2021).

4.2 Specific needs of Scientific Research Project (Diagnostic Process)

The development of project management methodology for scientific research is necessary to understand the background information of each laboratory, how they handle the projects that come in, and how they are executed from beginning to end. After the observations of the operation of the laboratory, now it is time to find the right methodology or the one that adapts best to the workflow in the research laboratory.

In the case of Gilbert Laboratory, an agile methodology that adapts would be profoundly helpful in meeting the criteria of multidisciplinary research ranging from human research to marine biology research through microbial ecology. This proposed project management methodology has been developed according to the following organizational needs:

1. Identify the needs or constant issues in the laboratory.
2. Develop project management methodology according to the needs.
3. Guidelines on how to implement the methodology.

The key factors that we need to consider before developing the methodology:

a. Sponsors.
b. Stakeholders.
c. Organizational Survey.
d. Organizational process assets.
e. Enterprise environmental factors.

Chart 18 Description Key Factor Before Developing the Methodology

Input	**Explanation**
Sponsors	Sponsors or grant funding determine the scope of the project, thus following the general guidelines to develop the research and needs is important to accomplishing the end goal. It is usually where the initiation of the project starts. It is crucial to assess how organizations would often complete projects and what type of results are expected
Stakeholders	Stakeholders are those who make up all the collaborators' roles in the project, and how they contribute relevant information for the project development.
Organizational Survey	Gather information regarding the current state of the project management practices from researchers and determine what fundamental aspects to implement.
Organizational process assets	Better understanding of the process assets that are considered to start a project and the existing templates.
Enterprise environmental factors	Identify organizational culture of research academia and governance practices.

Note: There are factors to consider that will dictate how the methodology should be developed based on the needs (Salas, 2021).

4.2.1 Sponsors

Scientific research relies on funding to start a project, which could come from private donors, for profit and nonprofit organizations including government funding to research an area of interest. The principal investigator who leads the laboratory based on the area of interest will encourage all researchers to apply and based on the approval of the grants will set the timeline to start the project. It is crucial that laboratories find funding because without it, it is almost impossible to do research.

Depending on the funding then the laboratory would have one to unlimited projects to work on, and it is distributed among the researchers that work for the laboratory. The laboratory operation and workflows are essential for the functionality of all projects. Without a backbone, many projects could fall out of scope because they could be delayed in execution, budgeting, and lack of availability of resources.

4.2.2 Stakeholders

Stakeholders are the team power for the projects and start from sponsors who are the initial investors in the project, then the principal investigator chooses the project manager. The project manager (PM) would put together the project proposal and charter to execute accordingly, including defining the team that would collaborate and make decisions for the project. The roles of each stakeholder are key for the project to develop based on scope, in a timely manner and within the budget, thus it is profoundly important that everyone is on the same page and that team communications flow in the right way.

Miscommunication is one of the crucial issues that a team can encounter, especially if it is a diverse team with different tones and preference of tools of communication. Thus, if it is not set clear from the beginning, then certain issues might arise in the process. In the Gilbert Laboratory, the main tools for communication are mostly formal through in-person meetings, emails, Zoom meetings, and informal through iMessage and WhatsApp. For each project, the type of communication tools will be included in the stakeholders and communication plan, which has not been part of the culture. However, nowadays with

researchers in a hybrid working system, the implementation of the communication plan could allow the collaboration to go smoothly.

4.2.3 Organizational Survey

To determine the state of the laboratory and how scientific research uses project management, unstructured interviews were conducted with different researchers in roles of graduate students, staff, post-doctoral, principal investigator, and project scientists. The unstructured interviews allowed for a better understanding of what has been implemented and areas of improvement to create a flow of project management. In the case of research laboratories, they often use LIMS or Laboratory Information Management System for the operational purpose of keeping track of inventory of chemicals, supplies, and samples collected. However, Gilbert Laboratory has realized that more than just keeping a general inventory, there are repetitive processes for most projects no matter what subject.

Thus, not only laboratory information management systems or communication tools would suffice for project management. Instead, the need for understanding better the workflow of the operations was realized, including each project from various researchers through every phase. The Gilbert Laboratory has been testing different platforms to put into practice to observe which one adapts the best based on the needs of the lab. The importance of data sharing and communication, as well as working with a software system that allows the templates and operational organization of the laboratory and to manage individual projects, have been the key for the organizational flow of the laboratory.

The past months, the laboratory manager with the team have been looking for appropriate templates and workflow to be able to apply to all projects. Overall, academic research is very specific to each researcher compared to industrial research where research can be more repetitive and streamlined. Thus, carrying out good practices from the leadership team to create the right workflow to be applied to all projects for the rest of the team has been a priority. By starting with the basic organization and structure of the laboratory, the changes have alleviated some pains while executing the project by enabling the research to focus more on the research instead of the administration side of each project. The notes of

the unstructured interviews are included in Appendix 4**.** The results from these interviews have been crucial to this proposal to create a template and workflow to present to the laboratory as a new tool for projects management in the following chapters.

4.2.4 Organizational Process Assets

4.2.4.1 Projects Workflow.

Projects are initiated through a grant specific to the research area, or for a startup laboratory the grant is a way to put the laboratory into operation and create preliminary data for grant applications. When a grant has been approved, then the laboratory has the green light to start the project execution. The grant consists of the project charter and proposal of how the project scope is going to be developed. This is the proposal phase for the overall project.

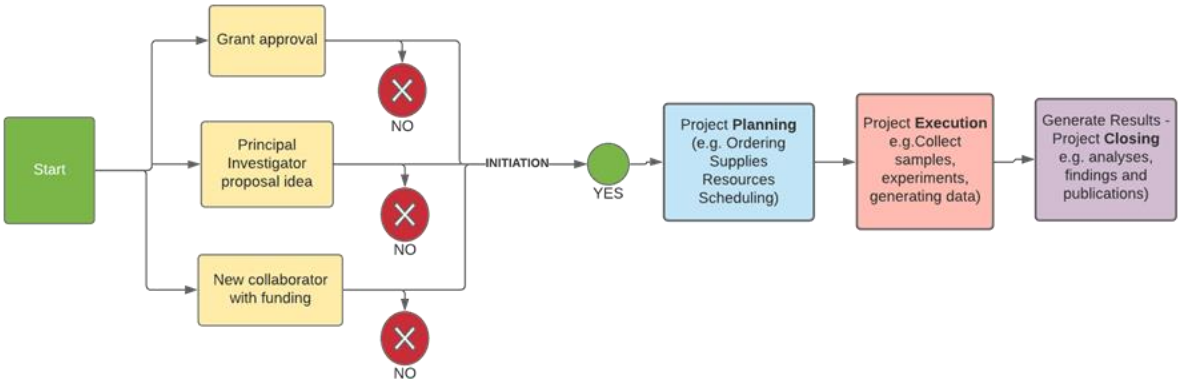
The initiation phase starts when the laboratory is ready to execute the funds, then the project manager, or in this case any researcher assigned to lead, will start the planning phase based on the project. The execution phase is when experiments are being developed and finally the closing phase is when the data is gathered from the experiments and results are presented. During those phases there is monitoring through meetings for updates and other needs of the project. Gilbert laboratory is involved in many projects, and all are based on sponsorship from a new grant, preliminary study to apply for a grant, or new collaborations with funding, all of which have similar phase processes as presents in Figure 9.

For instance, phases in a clinical setting would be to set surveys, gather supplies before recruiting patients, schedule, then collect samples from patients. This would be followed by taking them to the laboratory for experiments and analysis and finally the closing phase to gather all the data from the results and conclude the project based on them. At this point, there would be a check point to gather more data, create new collaborations, or move on from the project to a different one in a summary.

Another example in marine biology would be to get the funding for the initial phase with the proposal, then to get all supplies, resources, protocols, permits to go into the field for collecting samples. When this phase starts it is the execution such as collecting samples

from the field and bringing them to the laboratory to do testing and finally get the data together for new findings and present them to the world.

Figure 9 Current State of Process Flow



Note: The new research proposal starts if grant has been approved, funding is available for the scientist or a collaborator has the funding, then the other phases of planning, execution and closing will be developed (Salas, 2021).

Identifying each phase and its issues for the projects would allow us to build a standard structure or streamline those fits most of them, but at the same time constantly adapting to the new challenges for growing personnel in the laboratory. Thus, it is not just identifying and ignoring issues, but instead facing them and looking for ways of improvement. The following shows issues that were brought up during the unstructured interviews and are key to assessing the proposal methodology.

4.2.4.2 Bureaucracy.

The research laboratory is part of a public university with great standards and structure in place. Every laboratory works independently in each department and there are a lot of collaborations among them. However, there are a few aspects of the operations needed for all the laboratories that create a bottleneck at times. All laboratories of the university share the same marketplace where all packages are delivered to, leading to delays in

finding/tracking packages. There is a common receiving center and then packages are distributed internally to all UCSD. Overall, the system works, but it is not without flaws and supplies are sometimes delayed for projects due to this system.

Additionally, every laboratory is assigned with a financial manager, but this financial manager also has multiple other laboratories, which can become a bottleneck for procurement approvals and other budgeting aspects that a project may request. Although this can become a frustration in the workflow of each project, it is key to identify them as risks while managing a project and have contingency plans in case there is an issue. For example, the project manager can plan for the average response time in consideration of the role of the financial manager and for potential delays in the incoming supplies.

4.2.4.3 Time management handling multiple projects.

Multiple projects for one project manager in an average 40-hour work week could become overwhelming. The number of projects based on roles and funding available might dictate the number of projects that will be assigned to the researcher. Team management, the need for creating SWOT of the laboratory, and the scope of the research can dictate the priorities of the laboratory. Therefore, it is imperative to concentrate on those projects that bring value and let go those that might not contribute to the progress of the laboratory and researchers. It is key to also have an overall system for projects by goals and decide accordingly to work on what really matters to the laboratory.

4.2.4.4 Lack of planning.

Grants will often have a specific deadline and the need for preliminary data from experiments. Based on the leadership team and the strategy implemented to allow enough time to present the proposal, ideally the grant will be completed by the deadline. However, we know that life happens, and new collaborations appear, or new grant opportunities come up when the existing grant is due next month. Indeed, rushing to have all the resources to get the data would be a limitation in the planning phase. As there is one shot to have all the science turning okay to have it finalized for the grant, it is important to plan and prioritize appropriately to meet the needs of each grant.

4.2.4.5 Lack of communication.

Communication in any team is key to getting work done and the inefficiency of delivering a message could tremendously impact a project or the workflow of the laboratory. If an email is not well explained, or during a meeting there are not notes about the decisions making, then the message intended for the timepoint during the project can be confusing and create delays or issues.

Although there are some team members who may have better communication skills than others, this is a skill that can and should be learned. It helps if the organization creates tools for clarification during a meeting or prepares the templates in the development of a project to have them ready for the whole team to be on the same page.

4.2.4.6 Lack of record keeping and data.

Gilbert Laboratory did not have a structure to maintain a record of completed projects, in which case it is impossible to determine the extent to which projects have been completed within the allocated budget, cost, and time constraints. Gilbert Laboratory also did not have the classification generated project documents as historical records and instead had only project results.

Therefore, if a researcher left the laboratory, unless another research would substitute them and get the transfer of previous projects and what had been completed, then the transition would be difficult and time consuming to gather all the needed information to continue the project. This is an example of the benefit of keeping records in one place, thus accelerating transitions, and allowing teams to understand where they can find the information of any given project. In this proposal, the methods and standard structure that can be used to improve these transitions will be presented.

4.2.4.7 Lack of knowledge of project management practices.

When beginning at the lab, some researchers have experience of project management, but others were students who lacked much work experience. Therefore, it can be overwhelming coming into research where the number of collaborations and projects are complicated and there are many things to track.

Still, we cannot expect good practices if the organization itself has not implemented good practices of project management. Thus, it is essential to create a plan and train every new researcher that comes into the laboratory to promote common project management practices before once the methodology is implemented.

The following chapter will present templates to assess each issue based on the laboratory's needs and the templates needed in each phase to execute any project.

4.3 Development of Research Scientific Project Management Methodology

To ensure in-depth understanding of the methodology, the data collected from the interviews and understanding the workflow operation of the research laboratory are needed to develop project management methodology. The methodology presented in Figure 11 is called the Scientific Research Project Management Methodology (SRPMM).

SRPMM is based on the PMBOK® Guide and incorporates the current process of University of California, San Diego, and the Gilbert Laboratory as an example on how to use it in multiple projects. SRPMM focuses on:

- The interaction between sponsor, project team, and collaborators by appropriate allocation.
- Project management process templates from initiation, planning, execution, and closing to standardize the pipeline.
- Encourages production of written project progress and review of the progress within checkpoint meetings.
- Common project management practices as established by the PMBOK® Guide.

4.3.1 Institution Bureaucracy

SRPMM aligns with the existing bureaucratic procedures of University of California, San Diego location as elaborated in Chapter 2. The current project management flow is altered by incorporating crucial decision points in the execution and project documentation tracking through the process. The first decision point- Grant/Sponsor approval if yes? - is to ensure that project requirements, especially scope, timeline and budget are established before

proceeding. The second and third decision points ensure approval from stakeholders for all the planned and carried out tasks.

4.3.2 Project Governance

To tackle the issue of lack of planning and record keeping, SRPMM lists a set of documentation that needs to be produced at certain stages of the project. This promotes established project management practices and makes it easy to retrieve information.

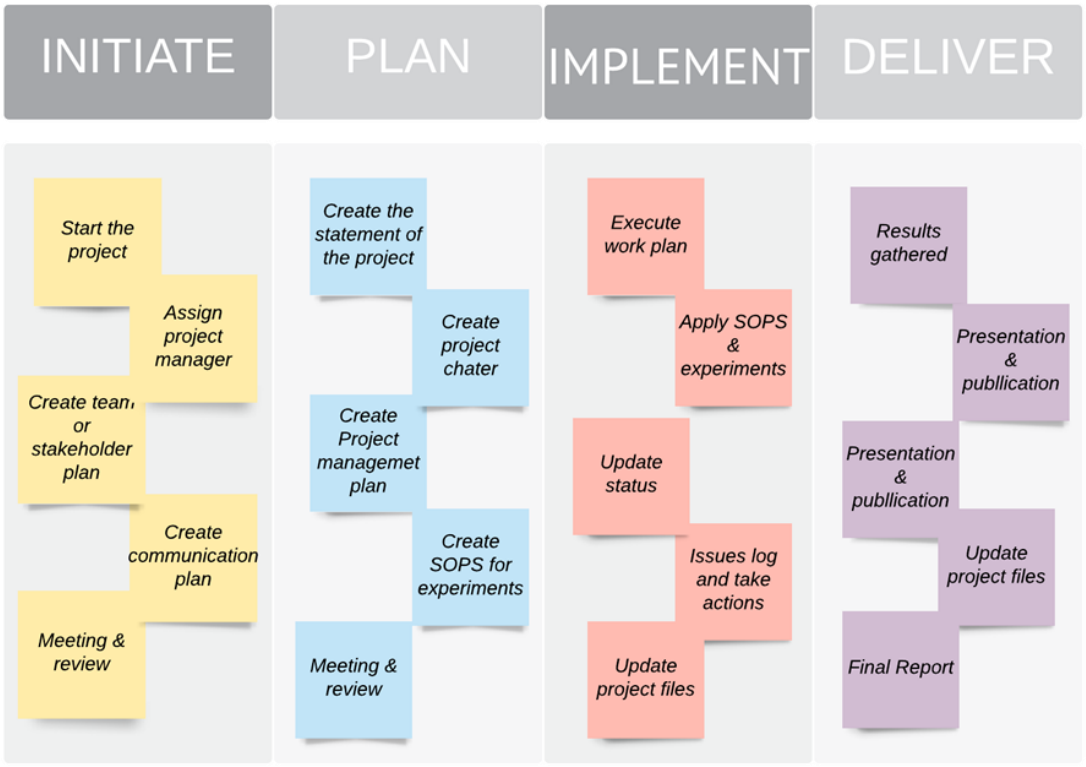
4.3.3 Assumption

It is assumed that the project execution and evaluation is carried out by the departments involved (team members) with one coordinating project manager, who ensures that all work performed is according to the approved plans.

4.3.4 Project Life Cycle

Based on this methodology, a project life cycle is developed and presented in Figure 10. The project life cycle is based on GPM Global's Project integrating Sustainable Methods (GPM Global, 2013). The modifications are limited to changes in phase naming to accommodate accustomed laboratory and research-specific terms. Figure 11 also lists some high-level activities that are associated with a particular project phase.

Figure 10 Project Cycle with Activities



Note: The project cycle goes from initiation with specific tasks and documentation to other phases requirements. It's key to have each stage clear of the project cycle. (Salas, 2021)

4.4 Description Scientific Research Project Management

As presented in Figure 11, SRPMM can be divided into 2 sections: Project Start and Project Development. Project Start outlines the approval process required prior to starting a project such as funding, while Project Development is the execution to advance the project through planning and development plus monitoring throughout the process and closing.

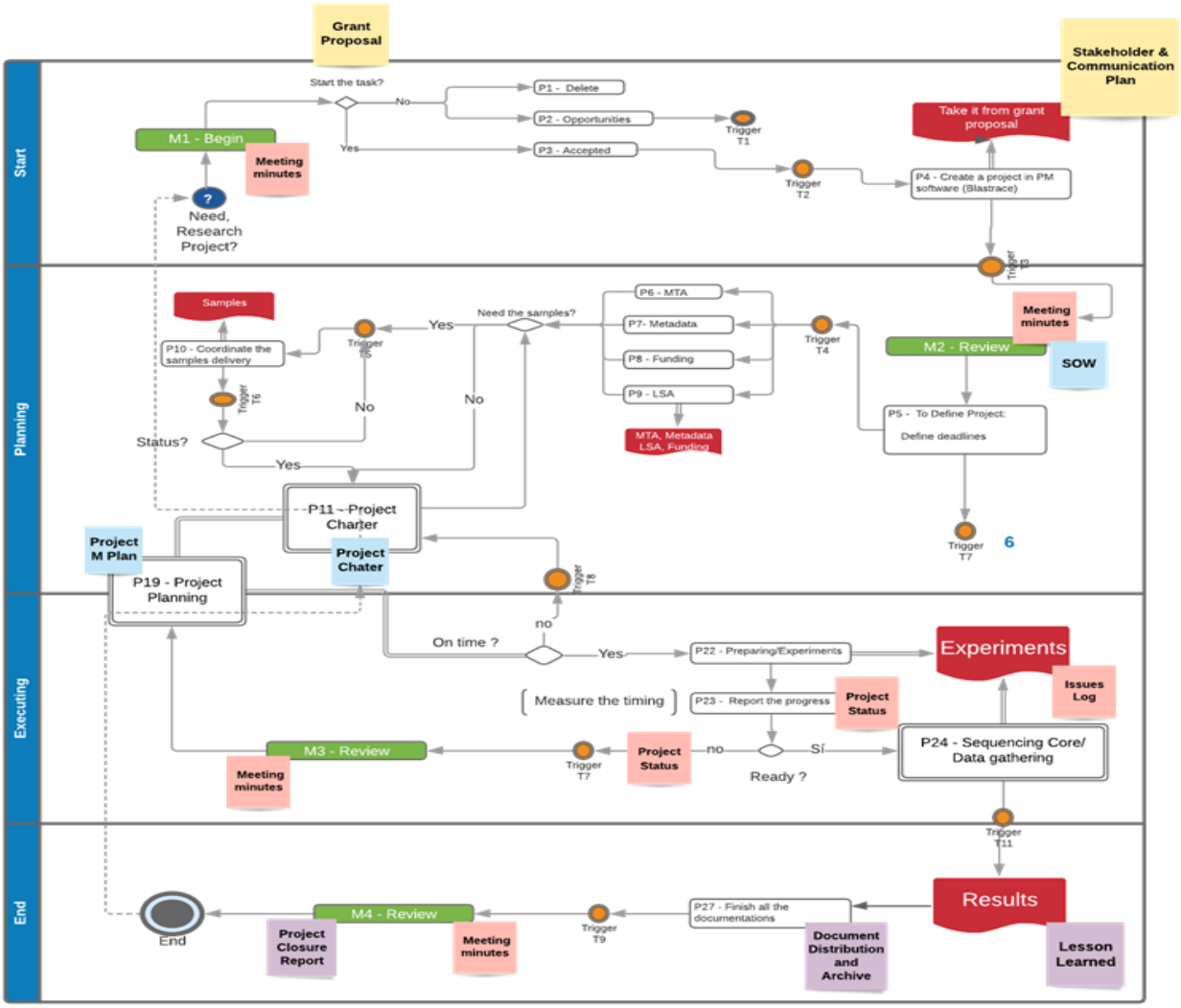
The start of a project is implemented when a research idea comes from a problem that needs to be solved and a grant proposal is approved with the funding to do the project. The grant proposal can start as initiative from the laboratory or other collaborators. From that point, the laboratory can create the first documents from the first meeting minutes, grant proposal and stakeholder & communication plan. When the right documentation of requirements is ready, then the planning phase starts from a meeting to approve with a

statement of work to define deadlines, any type of agreement or sort out the funding needed to execute.

Afterwards, proceed with the coordination of the type of samples or resources needed for the experimentation to prepare the standard operating procedure, at this moment, a summary of the project charter and more in detail information to follow in the project management plan to start the execution. During the execution process, the researchers would create a status and issue log to inform the progress of the project until there is data generated because of the experimentation. The timeline of this execution phase would be dependent on the number of iterations that the researchers needed to generate the results. That's why there could be multiple meetings, modifications of the Project Management Plan and Charter as needed.

When the scientists get to the point where data is generated then the closing stage should be presented with the findings and as suggested in project management good practices to develop a lesson learned, document distribution archive and project closure report. (Best Practices in Project Management | Smartsheet, n.d.). Monitoring is part of all phases because through the project is key to having those checkpoints to reassess in each meeting how the project is going, and the project manager must ensure that at any stage everything is flowing smoothly to accomplish the objectives described in the beginning. By combining each phase and documentation the Scientific Research Project Management Workflow can be used as a standard point of reference for any research project that any laboratory would like to pursue.

Figure 11 Scientific Research Project Management Workflow



Model Description

This document shows the workflow of a PM LAB that you must take care of and follow. Modeling our processes allows us to add form and structure in the environments, each variable can be measured and its state changed.

Glossary

P - Process

P1 - Delete
P2 - Opportunities
P3 - Accepted
P4 - Create project charter
P5 - To Define Project
P6 - MTA (Material Transfer Agreement)
P7 - Metadata
P8 - Funding
P9 - LSA (Laboratory Service Agreement)
P10 - Coordinate the samples delivery
P11 - Project Strategy
  P12 - To control Queue Projects
  P13 - To control de dates
  P14 - To control the email pool
  P15 - To check Extenal/Lead Collab
  P16 - Invoice
  P17 - To control Inventory
  P18 - To request supplies
P19 - Smart Plan
  P20 -To select the protocol respective
  P21 - To define the Method Development
  P22 - To define the Waste Management
  P23 - Biosafety Training
P22 - Preparing on it
P23 - Report the Progress
P24- Sequencing Core
  P25 - To do quality control
  P26 - To control the DATA BASES
P27 - Finish all the documentation

T - Trigger

T1 - To create future opportunities
T2 - To complete initial steps
T3 - Completed start process
T4 - To get the legal requisites
T5 - Coordinate the samples delivery
T6 - To control the process (sample status)
T7 - To set a meeting
T8 - Warning - Delay
T9 - Task - Completed
T10 - Scheduling
T11 - Results completed

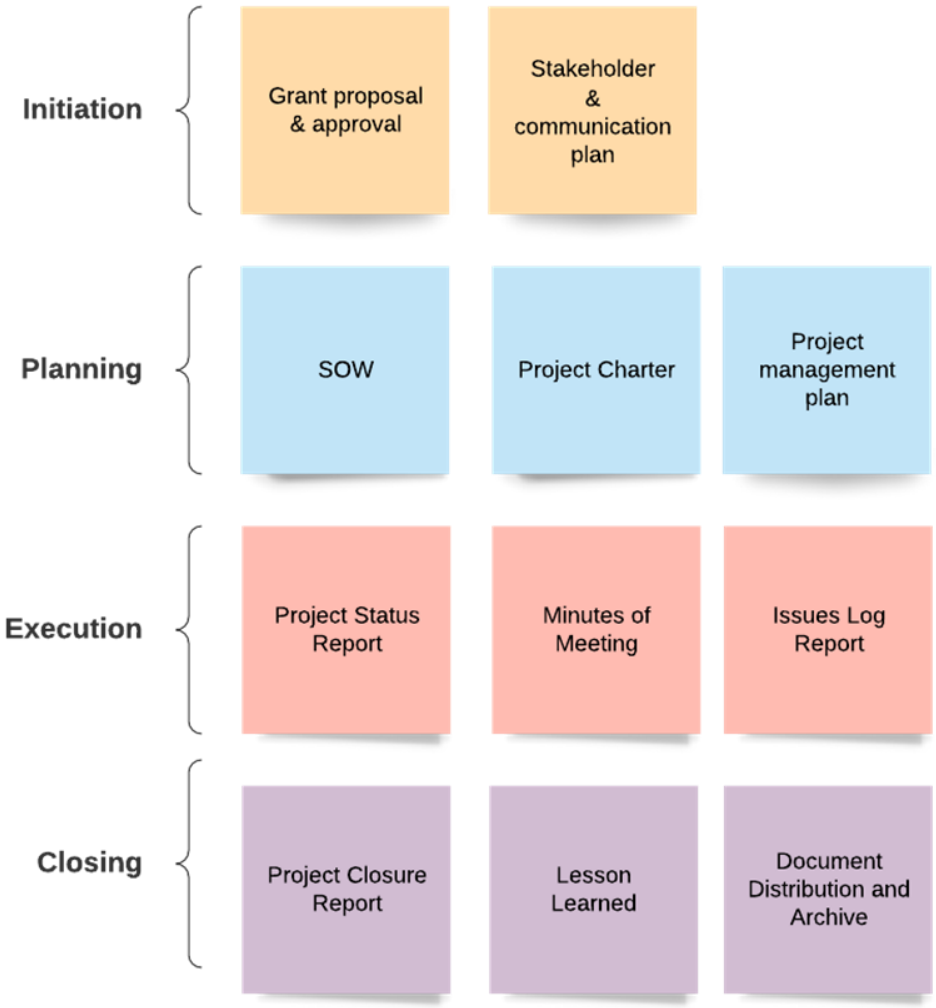
M - Meeting

M1 - To set expectations
M2 - Project Charter
M3 - General Checkings
M4 - Deployment

Note: The figure shows the workflow of project management methodology proposed for the Gilbert Laboratory or any other scientific laboratory. By modeling the processes allow us to create a standard structure where each variable can be measured, and its state changed (Salas, 2021).

Throughout the project development there is a list of documents that should be generated as input and output shown in Figure 11 as sticky notes through the workflow and in Figure 12 the most specific documents per stage and following with a description below.

Figure 12 Overview Documentation of templates needed in each phase of project cycle



Note: This is an overview of the templates needed at least of each stage to have a good practice of project management while developing scientific research (Salas, 2021).

In appendix D shows Scientific Research Project Management Templates then in Appendix E explains the Scientific Research Project Management Implementation Plan in the Gilbert laboratory and in Appendix F shows the Scientific Research Project Management Sample Project from the laboratory. Finally in Appendix G presents the overall Manual of Scientific Research Project Management Methodology for Gilbert Laboratory.

4.4.1 Initiation Phase

Research projects are proposed by the principal investigator, research team or collaborator who brings the grant or funding to identify a new project for the laboratory. Gilbert Laboratory can also be requested to do a collaboration by the institution or industry.

If the project is funded and the principal investigator with the leadership team approves the project to move forward, it is time for planning on how to execute. If there is no interest or time available for it, then the principal investigator will connect with another collaborator to keep working on it even though the laboratory will not proceed.

If the PI approves to start the project, the first step will be the designation of a project manager. This could be a project scientist, graduate student, research coordinator, or staff associate. Then, based on the grant proposal or statement of work the SOW will proceed for the planning.

During this phase it is essential to create team power or project roles and responsibilities, found in workflow template attached in Figure D4, which includes the responsibilities, who oversees the deliverables and who we need to inform, or update based on the needs of the project.

4.4.1.1 Grant proposal.

The research grant proposal is a document which the researchers prepare to obtain funding for a research idea or problem that they would like to solve. If the grant is approved,

then this document is the basis for the project life cycle, for template references in Figure D6.

4.4.1.2 Stakeholder & Communication Plan.

At this stage of the project the stakeholder list is part of the project charter and can be expanded within the charter until the project progresses to the next stage. Especially in research where there is outsourcing of experiments and analysis, it is key that all collaborators understand their role in the big picture and their involvement during the progression of the project. The communication plan is a good practice to set from the beginning of the project to determine the frequency of meetings, preferred methods of communication and how often a status update should be requested, for templates shown in Figure D4 and Figure D5.

4.4.2 Planning Phase

Before execution, it is key to have the planning of the project as lack of preparation could impact the resources available during the execution. The planning phase starts with a project charter followed by a project management plan.

4.4.2.1 The Project Charter.

A template project charter with guidelines is annexed as Appendix F and has already been implemented as a template for a research project. The feedback provided from the research team has been valuable in modifying according to the laboratory project's needs and ensure a user-friendly template. The project charter is an ongoing document that could change based on modification of the project, statuses, team, budgeting, or other factors. The template is shown in Figure D7.

4.4.2.2 The project management plan (PMP).

After having a grand scheme of the project, to execute any experiment, one of the most important parts of starting the development of a project is the planning phase. The PMP template is the document that describes how the project will be executed, monitored, controlled, and closed. It will integrate other key templates to track all the processes of the project.

This will allow the research team to centralize the workflow of the project and enable sharing documents in a decentralized way. For instance, if the project manager is the only one with access to all documents, and this person gets sick or goes on vacation, then if the team needs a specific document to keep working this would create delays in the execution of the project.

The PMP includes but is not limited to:

- Project Governance, Change request and project/phase closure.
- Scope Management including the Work Breakdown Structure (WBS)
- Cost and Procurement Management
- Time Management including the Resource Breakdown Structure
- Quality Management
- Risk Management
- Communications Management

The PMP is compiled in one document in Figure D9. The strategy is keeping this document as record tracking and having an overview of constraints and changes throughout the development of the project. The communication plan is part of the plan management project and is kept separately to first define the roles and from there create a plan. Appendix contains the PMP template and is designed to give a quick start to any research project.

4.4.3 Execution Phase

The input of the grant proposal or statement of work into the Project charter as a one-page summary of what the project is about, scope, timeline, and budget, allows the project manager to apply the resources available and plan with the team on how to do the experiments and protocols for maximizing execution.

4.4.3.1 Project Status Report Template -Including Experiments.

The Project Status Report Template compiled in Appendix 1 allows a more detailed status highlighting project accomplishments to identify outstanding issues. It also includes

upcoming activities. There is also another general status that is implemented in the project charter for the overall view of the project. The template is presented in Figure D10.

4.4.3.2 Minutes of a Meeting Template.

Minutes should be recorded at all project meetings using the Minutes of a Meeting Template that is attached as a Figure D11.

The minutes should be sent to participants and other identified parties after the meeting for their record where any changes in the project, decisions, or new roles or action plans should be implemented. This will allow them to follow up in the next meetings and understand the progress from time to time.

4.4.3.3 Issue Log Template.

In research it is common to mention issues through an email or meeting but having an issue log as a document helps to identify issues that require a resolution. The designed issue log template in Figure D12 also distinguishes between high, medium, and low priorities.

4.4.4 Closure Phase

4.4.4.1 Lesson Learned.

Throughout the life cycle of a research project there are so many details to consider that some processes are going to turn out as expected and some not, that's why that reflection and feedback amount collaborators are important for the project itself and new upcoming projects. This template would allow us to have it as referenced for the research project manager and others to learn from. The template is attached in Figure D16.

4.4.4.2 Document Distribution and Archive.

The number of documents created in a research project development could be overwhelmed for stakeholders, for that reason the use of this template can be used as standard to have an open centralized document that can locate any other documents based on the phase and retrieve as needed. The Figure D15 contains the template.

4.4.4.3 Project Closure Report.

In the project closure report, presentation or publication, the project manager reviews all the information and checks for project work completion. If the project is terminated before completion this is also addressed and recorded. The project closure report also includes information on how the project documents are archived for future historical data. In some cases, the project manager must make a presentation with the results, and the paper which is going to be published if it applies. The Figure D14 contains template for the project closure report. The project closure report can also be used to report the phase closure report.

4.4 Project management templates for Scientific Research

A total of eleven templates have been developed to obtain standardization of the projects for Scientific Research in Gilbert Laboratory at University California, San Diego as shown in Figure D2. These templates support the creation of overall structure and workflow for projects managed by the research teams in accordance with generally recognized good practices of the PMBOK® Guide as presented in Figure D1. The templates also ensure compliance with grants or funding sources and can easily be expanded by annexing other needed documents throughout the process.

The templates can be classified as:

Project management plans, which describe how the project will be executed, monitored, and controlled (Project Management Institute, 2013). The Project Management Plan (PMP) and Communication Plan fall under this category. The Communication Plan serves as a supplemental document of the PMP and is presented separately to start stakeholder planning at an early stage to accommodate existing roles, responsibilities, and communication methods.

Execution project documents, which are not part of the Project Management Plan, but are used to gather data, track, and support the PMP. Documents such as Project Charter, Lessons Learned template and Minutes of Meeting fall under this category. To make the templates available ready to use document, the templates have been annexed in D. Chart 19 provides a list of appendices that serve as a template for SRPMM.

The next section the templates in appendix D are integrated to conduct projects according to guidelines of SRPMM and standard structure used to apply to all projects, but also flexible enough to modify accordingly.

In appendix E presents how to implement the SRPMM and finally in appendix F a sample project which shows how to use most of the templates in a real project and it can be modified based on the projects need.

Chart 19 Templates Names for Scientific Research Project Management

Note: The templates names for each phase of the project are annexed in appendix 5 and follow how to implement the templates in appendix 6 and an example of a project in appendix 7 using templates.

4.5 Workflow and implementation of SRPMM

The SRPMM templates could be standalone templates or integrated with project management software or team management software to be streamlined throughout the course of project. In this case, Gilbert Laboratory has adopted Blastrace project management workflow powered by Atlassian, Monday.com for procurement requesting supplies, and

OneDrive by Microsoft as depository for document sharing and archiving. All the templates have been created and implemented in Blastrace, in confluence workspace designed in Figure D1.

The implementation has been a gradual migration from old practices to new the workflow guided by the templates, training the research team on how to use it and continual optimization until the templates are most effective for the projects as shown in section Appendix E.

The research team has already started the migration using some of the templates, but the final rollout will be executed in a project from start to end with clear guidance as follows.

4.4.1.1 SRPMM preparation.

Before implementing the methodology, it is important to identify a team and roles within Gilbert Laboratory including a project manager, who will be responsible for implementing the methodology. The team should encourage feedback from the various stakeholders and adjust the methodology where necessary. Personnel from Gilbert Laboratory who are part of the team will receive a general project management knowledge training from the lab manager. It is also available as a course through the University of California, San Diego.

4.4.1.2 Pilot Project to test SRPMM.

After completing the training, the team will identify and prepare a pilot project to start the deployment of SRPMM.

The Pilot Project allows the project team to demonstrate success on a small scale before scaling up to larger projects. Success of the Pilot Project can be communicated to the laboratory team to gain support for the methodology.

To aid the team in this step, the scenario presented in Appendix E is to exemplify the application of SRPMM on a typical project for Gilbert Laboratory.

4.4.1.3 Progressive rollout.

After closing the Pilot Project, the SRPMM implementation team will progress to phase 3 which is the migration of SRPMM within Gilbert Laboratory.

The phase starts with a kickoff meeting, which will formally introduce the project team to the personnel of Gilbert Laboratory. It will further outline the purpose, set the tone, clarify expectations, and ensure that participants feel comfortable with upcoming meetings (Project Management Institute, 2013). The main goal is to promote communication and create enthusiasm and understanding among the stakeholders.

The kickoff meeting will consist of a presentation of SRPMM, depicting how SRPMM works and how it will streamline future projects of Gilbert Laboratory and showcase success from the Pilot Project.

Overall Instructions Project of the laboratory as it's shown in Blastrace workspace and added in Figure D1**:**

- If you start or get assigned a project, then create a project template and connect it to OneDrive folders
- Use this project workflow to trace your project from beginning to end including all collaborations.
- Completed projects:
    - If you are done with the collaboration or you have finished the project, then move it to completed projects in Blastrace and OneDrive.

4.4.1.4 SRPMM Training and General Project Management Training.

This part is to do training of the various personnel of Gilbert Laboratory with the concepts of SRPMM. The training will be for the laboratory leadership team and afterwards the rest of the team. A typical training session is calculated to last 6 hours per day for 4 days per group of 9 people. Although training curriculum development is not within the scope of this graduation project, it is noted that the curriculum should include:

- General concepts of project management

- Description of SRPMM
- Group assignments to promote collaboration and group decision making when conducting projects.

To reduce expenses to implement SRPMM, team members from SRPMM Implementation Project will alternately train personnel of Gilbert Laboratory in General Project Management and how SRPMM can be implemented to future project implementation via zoom training.

4.4.1.5 SRPMM Implementation Closure.

Once all identified personnel have been trained, the project team can take the appropriate steps to formally close the project.

5. REGENERATIVE DEVELOPMENT

5.1 Description of sustainable methodology, indicators, and targets

Regenerative Development pushes beyond sustainability. An integral approach based on ethics, principles, and values as a more efficient way to apply problem-solving in any project The priority of regenerative development is to apply "holistic processes to create feedback loops between physical, natural, economic and social capital that are mutually supportive and contain the capacity to restore equitable, healthy and prosperous relationships among these forms of capital." (The Path to a Regenerative Future, 2018). The importance of problem solving holistically has exposed many flaws to business practices. The problem is often solved more specifically to the problem area, but it's often forgotten the indirect areas affected by the problem, which this type of solution would require a better holistic approach.

The main difference is that sustainability concentrates on development today that disenables the ability of future generations to develop. As an example, for this proposal of a Scientific Research Project Management is key that the methodology transcend not only for the use of one laboratory but beyond other scientific communities as we have observed

researchers keep looking for new knowledge or findings with often the scientific method, but as everything evolve and the changes of technology there is a need to multitask and trace every detail of an project, which sometimes a researcher deals with multiple project and hundreds of details at the time. If every researcher must reinvent the wheel of how to develop a project and keep doing repetitive processes, then this is not sustainable for the researcher or the organization.

The templates created by SRPMM are part of regenerative design that encompasses the holistic approach that one standard methodology of project management can fits all systems in scientific research workflow even if the topics of research are way different from marine biology or biomedical applications. The key is creating these templates as a basis that co-evolves as new implementations need to be for a specific project. This way is not only about creating a customized methodology with templates that serves only what type of problem or area but goes beyond to help every research project that ultimately could have great impact beyond our imagination (Gibbons, 2020).

The researchers are constantly analyzing and trying to answer many questions for innovation, but who helps them to get this done. This is the reason how a simple methodology with templates can speed up discovery as the researchers avoid overwhelming of the management or administrative work and focus on the data and process that are necessary for findings. In other hand, while developing any project is crucial defining the impact of different businesses with climate changes on how they get their services or products done. Because it's clear when an organization has the holistic approach or not (The Path to a Regenerative Future, 2018). This is an indicator and target of how a project is developed as the need for ethics in any organization' supply chain is now of critical importance. "Society expects organizations, their suppliers, and their entire supply chain to be free from human rights abuses, slavery, child exploitation, and other violations of society's values" (Carboni et al., 2018).

This is in consideration regarding project procurement management by finding the balance relationship between natural and human systems through interconnectivity. Any

institution before approving the development of any project would need to think about spiritual, social, political, economic, cultural, and environmental aspects before doing any business within or with external businesses. The project procurement is obtaining all the materials and services that are required for the project (Project Procurement Management - A Quick Guide, 2018). When we think about ethical development for small or big projects in an organization, it is crucial to research each contracting material or service to align with this integral approach or even the values created by the organization must have a basis on these principles.

The social approach promotes small and large businesses, which creates an equitable community to compete and where to get the services and supplies. The economic area is based on fairness to compete and the end user to decide which one to get based on all the other principles. The political structures which allow participation, transparency, and ethics where to choose based on our values. The spiritual approach based on values from the organization and stakeholders choose which products are more aligned with the scope of the project.

The environmental principle aligned with values of global well-being as stakeholders to obtain supplies as environmentally friendly as possible. The cultural environment and sharing with the community that project can be more outreach. The combination of these factors gives us as a product a more well-balanced decision making to develop a project and any stage to keep it aligned with the scope based on ethics, values, and principles of all stakeholders. The Scientific Research Project Management Methodology templates proposed a regenerative development through project life cycle.

6. CONCLUSIONS

1. The challenges facing Gilbert Laboratory were determined by interviewing personnel and being part of the transition to innovate within the laboratory, establishing that some project management practices needed improvement within the research team.
2. Lack of thorough planning, communication, knowledge of common project management practices and data management has made project execution a challenge and at times led to less desirable outcomes and results.
3. Scientific Research Project Management Methodology was developed to standardize the current project management practices of Gilbert Laboratory. The methodology is based on the existing decision-making process and adapts to common project management practices, increasing Gilbert Laboratory's ability to effectively complete projects.
4. Traceability of project development offers opportunities to implement changes during execution and the possibility of improvements in project management for future projects. The most common issues were addressed in SRPMM and allow room for improvement and adapt to any shortcomings.
5. A total of eleven templates were created that cover all the knowledge areas. The templates were catered specifically towards Gilbert Laboratory by aligning these with current laboratory practices. However, as Gilbert Lab is a multidisciplinary research group, these templates can be used in many areas of research.
6. SRPMM was described in detail to ensure that the user understands the methodology as well as its workflow, enabling continuous improvement and proper utilization.
7. An implementation plan was developed encompassing a progressive rollout to ensure proper implementation and adaptation of the developed methodology.
8. A sample project with the actual needs throughout a Sars-Covid-19 research was created to demonstrate how SRPMM is applied to a typical project within the organization.

9. The whole methodology allows us to pass on to other laboratories and future scientists which they can reutilize for all upcoming projects and create a collaborative environment to allow regenerative development.

8. RECOMMENDATIONS

1. SRPMM together with all the templates, are not static documents and should be updated regularly to ensure that it responds effectively to Gilbert Lab's needs and any changes within its bureaucracy.
2. Updates in project management training or at least once a year would be needed to keep the material refreshed and creating an onboarding training for new personnel would be essential to keep the standardize practice of project management within the laboratory.
3. It's key that the laboratory management team leads by example to apply these practices to create consistency and a more organized project management culture within the team.
4. For scientific research beyond this laboratory, the templates can be implemented and share across collaborators to have a centralized document while working in a project and at the same time decentralized collaboration by given accessibility to all parts.
5. The implementation of this methodology will allow a better traceability of the data of any project across the project portfolio of the laboratory, but it's key to be consistent in executing it while also working with external collaborators.
6. It's key to assign a project manager or lead for each project that starts to guide through the methodology and execute good practices of the project management.

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APPENDICES

Appendix A: FGP Charter

PROJECT CHARTER	
Date	**Project Name:**
Issue date: 15 May 2021	The development of a Project Management Methodology guide for scientific research in Gilbert Laboratory, University of California, San Diego.
Knowledge Areas / Processes	**Application Area (Sector / Activity)**
Knowledge areas: Project Integration Management, Project Scope Management, Project Time Management, Project Cost Management, Project Quality Management, Project Human Resource Management, Project Communications Management, Project Risk Management, Project Procurement Management and Project Stakeholders Management.	Scientific Research in academia and industry ● Scientific research and development ● Grant proposals ● Clinical trials

Process groups: Initiating, Planning, Executing, Monitoring & Controlling and Closing.	
Start date	**Finish date**
Same as the issue date	February 23rd, 2023
Project Objectives (general and specific)	
General objective: To develop and implement a project management methodology guide for scientific research at Gilbert Laboratory, University of California, San Diego to increase traceability for all new projects and create an effective multi-interdisciplinary projects portfolio. Specific objectives: 1. To identify the specific needs such as the lack of workflows and organization for multi-interdisciplinary projects within the laboratory. 2. To propose a framework for standardizing projects and develop project templates and techniques to apply to the management of future scientific research projects. 3. To describe how the proposed methodology works to ensure in-depth understanding of the methodology.	

4. To create a workflow plan to utilize the proposed methodology.

Project purpose or justification (merit and expected results)

In the scientific research community, such as in the Gilbert Laboratory, University of California, San Diego, managers must have a deep understanding of how to deal with multi-interdisciplinary science projects involving multiple collaborators and sponsors as the stakeholders of each project. These multi-project laboratories must have not only grant writers, managers, and researchers, but also an operations structure and project management guidance to maintain traceability of all projects. The implementation of an agile methodology of project management is key to the success of all projects that ultimately have a profound impact in knowledge and discoveries for life science and our society. The methodology proposed is based on the standard of Project Management Institute that would be the guidance for introducing a workflow and providing templates from the initiation of any project in the laboratory all the way to the end of the project. By implementing a structure guidance as a tool, this will allow not only traceability and collaboration of all details for each project's needs, but also it will allow project managers an easier way to manage multiple projects in many cases based on the laboratory's need.

Assumptions

The methodology will allow a workflow for project management in the laboratory

The projects will be delivery based on deadlines agreed in project charter

All resources available will be used to develop the methodology
Constraints
Reviewers must check each project deliverable in timely manner allowing time for corrections Balancing work and the developing of this project
Preliminary risks
If the project manager or supervisory support gets sick while developing this project during worldwide pandemic and project deliverables are delayed. If reviewers have multiple projects to review, feedback and deliverables could be delayed. If supervisory support has multiple projects to review, the quality of feedback and overall final quality of the project could be impacted.
Budget
Not defined yet
Milestones and dates

Task Name	Start	Finish
Final Graduation Project	Mon 9/19/22 8:00 AM	Fri 2/3/23 5:00 PM
FGP Start	Mon 9/19/22 12:00 AM	Thu 2/2/23 5:00 PM
1, Graduation Seminar	Mon 5/10/21 8:00 AM	Fri 6/11/21 5:00 PM
2, Tutoring process	Mon 9/19/22 8:00 AM	Wed 11/23/22 5:00 P
3, Reading by reviewers	Mon 12/12/22 12:00 AM	Mon 1/9/23 12:00 AM
4,Adjustments	Thu 1/19/23 12:00 AM	Mon 1/23/23 5:00 PM
5,Presentation to Board of Examiners	Mon 1/23/23 12:00 AM	Thu 2/2/23 5:00 PM
FGP End	Thu 2/2/23 8:00 AM	Thu 2/2/23 8:00 AM

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

Project Management Methodology guide will serve as a template for guidance for each project phase from initiation, planning, execution, monitoring, controlling, and closing for the scientific research within Gilbert laboratory, University of California, San Diego.

Relevant historical information

The Gilbert Laboratory at UCSD is a highly interdisciplinary research lab involved in medical, environmental microbiology and biotechnology development. Each research project requires a grant proposal that encompasses the project management development of the future experiment after grand approval. Then, upon project initiation, a project management methodology is required to work on the development of the research project with collaborators and sponsors with the end goal of getting results within the scope of the project. Ultimately, findings from some projects are scientifically published, some projects will progress to clinical trials and others enable the development of a biotechnology product.

Stakeholders

Direct stakeholders:

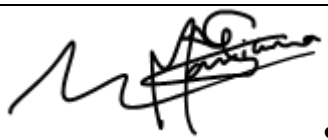
Course Facilitator

Academic Assistant

Project Review Board

Tutor Indirect stakeholders:

Classmates

Project Manager: Mariana C Salas Garcia	 **Signature:**
Authorized by:	**Signature:**

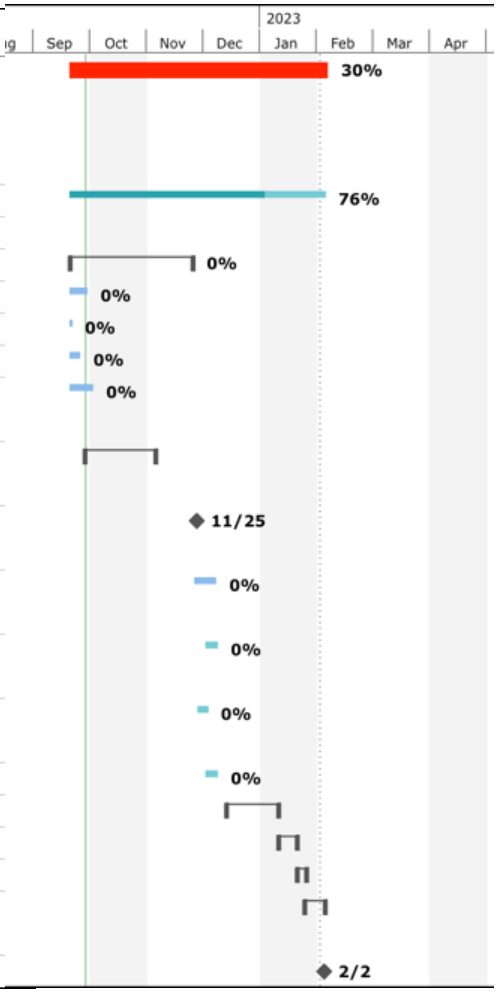
Note: The project charter is a summary of how the final project is going to be developed (Salas, 2021).

Appendix B: FGP WBS

Note: This work breakdown structure shows the developing of the final graduation project to deliver the Scientific Research Project Management Methodology. (Salas, 2021)

Appendix C: FGP Schedule

	Task Name	Resource Names	Duration	Start	Finish	Work
1	Proposal of a Project Management Methodology for scientific research in Gilbert Laboratory, University of California, San Diego		100 days	Mon 9/19/22 8:00 AM	Fri 2/3/23 5:00 PM	0 hrs
2	FGP Start		100 days	Mon 9/19/22 12:00 AM	Thu 2/2/23 5:00 PM	0 hrs
3	1.Graduation Seminar		30 days	Mon 5/10/21 8:00 AM	Fri 6/18/21 5:00 PM	0 hrs
4	2.Tutoring process		48 days	Mon 9/19/22 8:00 AM	Wed 11/23/22 5:00 PM	0 hrs
5	2.1.Tutor		7 days	Mon 9/19/22 8:00 AM	Tue 9/27/22 5:00 PM	0 hrs
6	2.1.1.Tutor assigment		1 day	Mon 9/19/22 8:00 AM	Mon 9/19/22 5:00 PM	0 hrs
7	2.1.2.Communication		5 days	Mon 9/19/22 8:00 AM	Fri 9/23/22 5:00 PM	0 hrs
8	2.2.Adjustments of previous chapters (If needed)		10 days	Mon 9/19/22 8:00 AM	Fri 9/30/22 5:00 PM	0 hrs
9	2.3.Charter IV. Development (Results)		29 days	Tue 9/27/22 12:00 AM	Thu 11/3/22 5:00 PM	0 hrs
29	Final Graduation Project Submission to Philology		0 days	Fri 11/25/22 8:00 AM	Fri 11/25/22 8:00 AM	0 hrs
30	Philology professional review		7 days	Fri 11/25/22 8:00 AM	Mon 12/5/22 5:00 PM	0 hrs
31	Incorporate revission dictum of philologist		5 days	Thu 12/1/22 12:00 AM	Tue 12/6/22 5:00 PM	0 hrs
32	Final Graduation Project Submission to Tutor		4 days	Sat 11/26/22 5:00 PM	Thu 12/1/22 5:00 PM	0 hrs
33	Tutor approval		5 days	Thu 12/1/22 12:00 AM	Tue 12/6/22 5:00 PM	0 hrs
34	3.Reading by reviewers		21 days	Mon 12/12/22 12:00 AM	Mon 1/9/23 12:00 AM	0 hrs
39	3.2. Reviewers work		9 days	Mon 1/9/23 12:00 AM	Wed 1/18/23 5:00 PM	0 hrs
46	4,Adjustments		4 days	Thu 1/19/23 12:00 AM	Mon 1/23/23 5:00 PM	0 hrs
50	5. Presentation to Board of Examiners		10 days	Mon 1/23/23 12:00 AM	Thu 2/2/23 5:00 PM	0 hrs
53	FGP End		0 days	Thu 2/2/23 8:00 AM	Thu 2/2/23 8:00 AM	0 hrs



Note: This grant chart shows the timeline while the final project of graduation is going to be developed (Salas, 2021).

Appendix D:

Table D1:

Interviewee list and notes

Researcher/ Professor / Collaborators				
#	**Name**	**Role**	**Interview**	**Email**
1	Jack Gilbert	Professor Gilbert Laboratory, UCSD		gilbertjack@gmail.com
2	Beatriz Penalver	Professor Bea Laboratory, UIC		bpenalver@gmail.com
3	Kristen Carter	Director Microbiome Core UCSD		kkcarter@ucsd,edu
5	Enrique Acuna	Professor UCR		enrique.m.acuna@gmail.com
6	Juan Carlos Salas	Professor TEC		jcsdalas@itcr.ac.cr
7	Austin Swaford	Director Center Innovation Microbiome, UC San DIego		adswafford@eng.ucsd.edu

8	Yindy MR	Investigator		yindymr@gmail.com
9	Monica RG	Investigator Cenibiot		morogo27@gmail.com
10	Megan Thoemmes	Posdoctorado UCSD		msthoemmes@gmail.com
11	Ariadna Hernandez	Undergraduate Student TEC		ariadna.hm20@gmail.com
12	Sho Kodera	Lab Technical Staff UCSD		skodera@ucsd.edu
13	Sonya Donato	PhD, Lab Technical Staff UCSD		sonya.donato@gmail.com
14	Neil Gottel	Graduate Student UCSD		ngottel2@gmail.com
15	Emily Kunselman	Graduate Student UCSD		ekunselm@ucsd.edu
16	Marcel Murillo	Colaborador Lab-CCSS		murillomarcel@gmail.com

Note: All interviews were recorded to understand the stakeholders' needs and potential solution methodology (Salas, 2021).

Interview questions

Below describes all the questions asked in the interview.

Welcome 1min

Context - Scientific research continually strives to make discoveries, but there are obstacles throughout the process that generate a greater probability of failure than success in initiating each research project. "The systematic recording and management of experimental data in academic life science research remains an open problem." (Argento, 2020)

Profile:

Explore the need and expected results 5min

What work do you need to get done?

What worries, dislikes or other needs do you have?

Identify used and alternative solutions 5min

What are you currently using and the alternatives that you know or have considered?

Find out frictions and inertias 8 min

What aspects do not work well nowadays or anything that does not meet your expectations of the current solution?

What prevents you from exploring other alternative solutions?

Documentation 5 min

Revision of what happened: record responses, reactions, and observations of the interview.

Summary Interview Notes from Principal Investigator and researchers

Answers to the above questions from researchers.

1. Trigger: Where and when does the need arise?

- A project of investigation
- An experiment is started in the laboratory
- A collaboration begins
- When you have multiple research projects
- When you have paper data, and you need digital
- Need to have an organized laboratory

2. Expected results: What you hope to achieve and under what criteria?

Traceability of all investigation details

- Have everything in one platform for analysis
- Easy to collaborate and share data among researchers
- Transfer very heavy data online
- Have the laboratories organized to be able to work

3. Current solution: How do you solve it now?

- Emails gmail, outlook
- They use google doc, sheets, word document, excel, zotero, monday.com project management software, slack
- Jupiter notebook
- iProtocols

- Power Point
- Dropbox
- WhatsApp
- Paper

4. Alternatives considered: what other ways do you think the problem can be solved?

Trouble

- Have all the data in one server
- Use multiple programs communication and data
- Using a project management software for laboratories

5. Inertia: What prevents you from using other existing solutions?

- Project programs difficult management configure and not so user friendly
- Price of very expensive SaaS
- Difficult integration with other programs
- A lot of time to spend everything to a program

6. Frictions: What bothers you about the solution you currently use

Many programs for plot data multiples

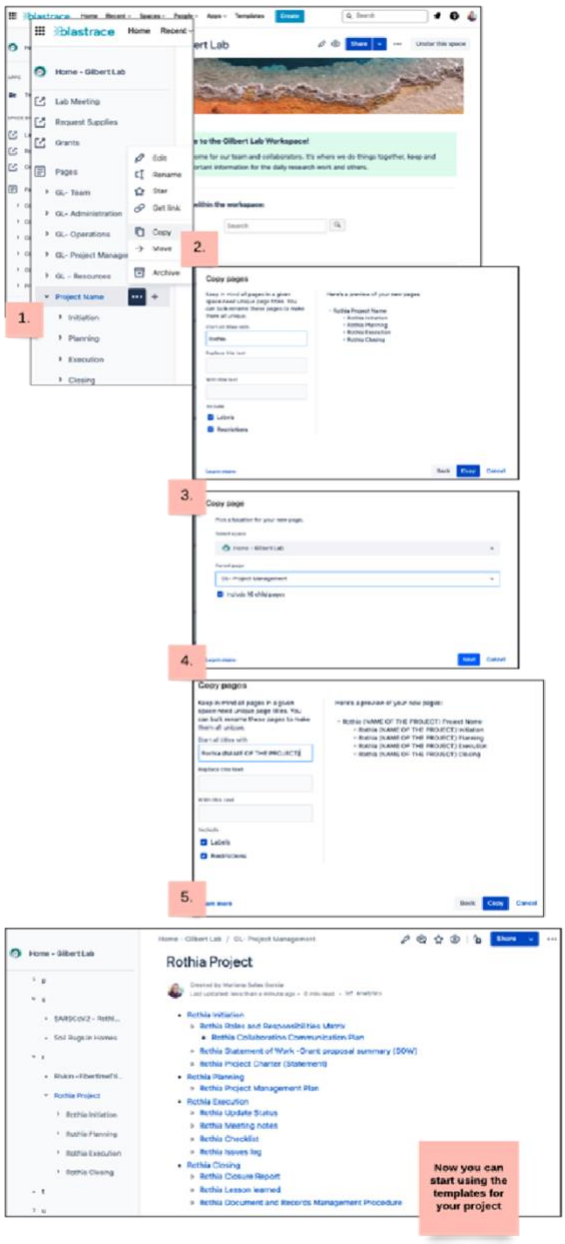
- Transcribe all from the paper
- Time spent in a bunch of platforms and search data.
- Have all the investigation on time
- Collection of all data in one platform
- Results together with the documentation

7. Next steps: obtained the results, which you require the most. How you can generate more value

Customers agreeable to the new solution and to be able to test the Blastrace platform for project management as beta testers.

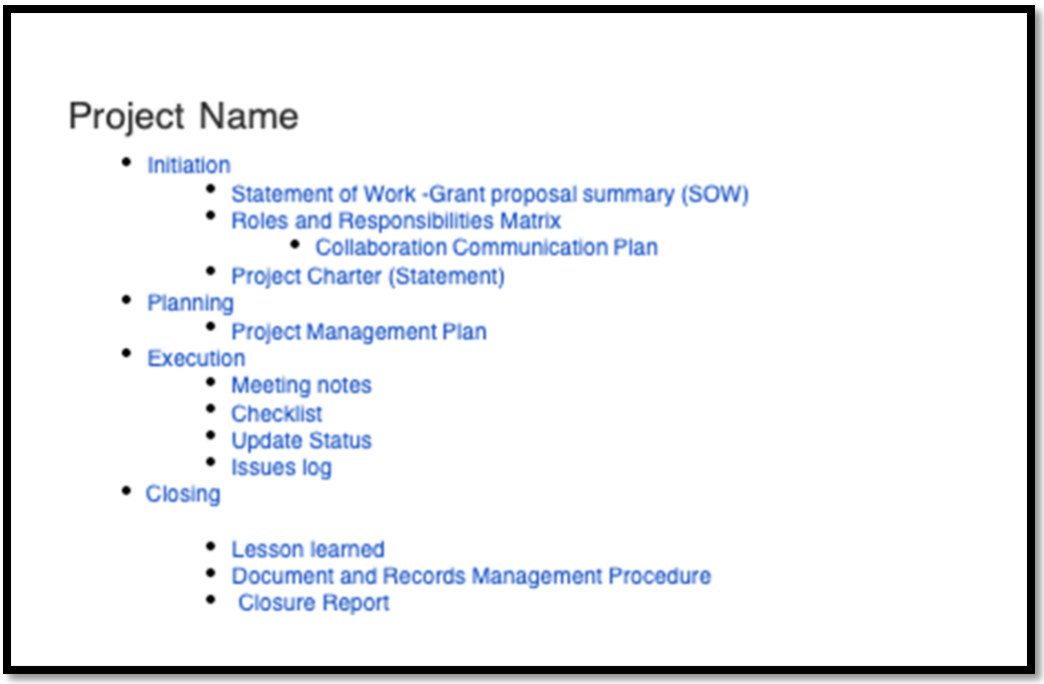
Appendix D: Scientific Research Project Management Templates

Figure D1 Workflow using templates in Blastrace platform for Gilbert Laboratory



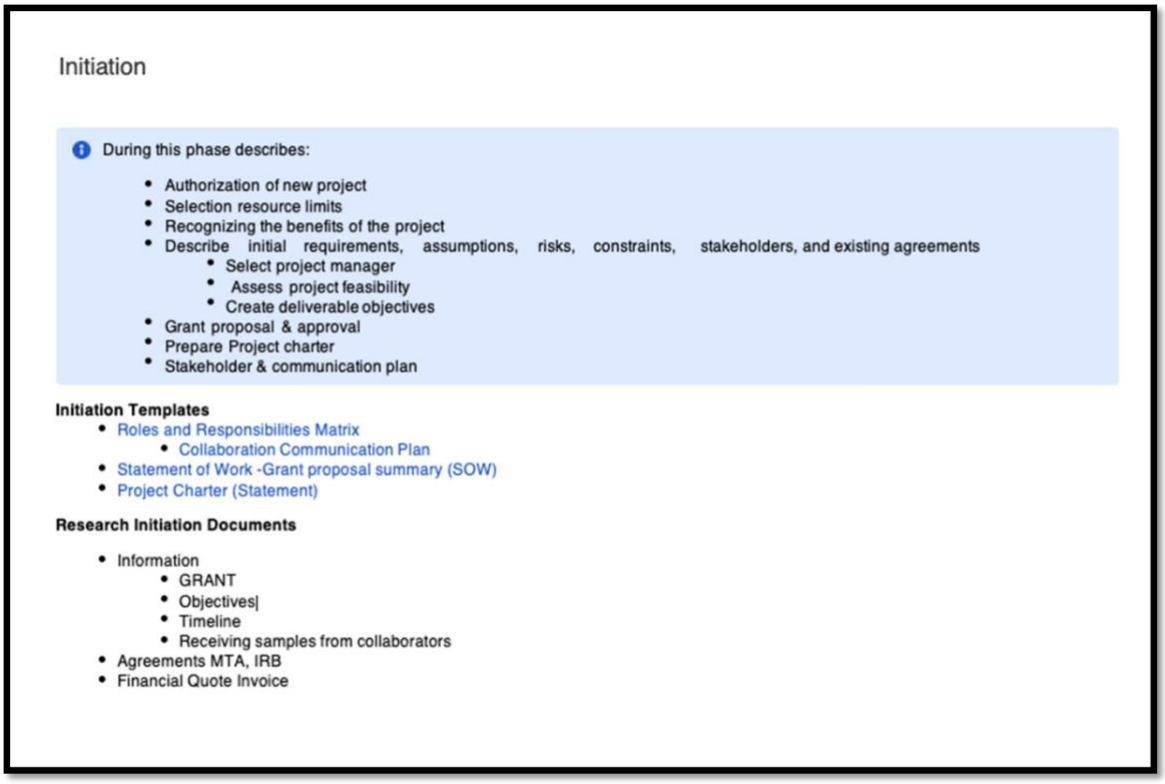
Note: The figure describes the steps when a gilbert laboratory copies the templates created from the SRPMM in their Blastrace workspace to use in an upcoming project. Now the project manager can start using each template through the development of the project (Salas, 2021).

Figure D2 Templates naming based on the phase of the project life cycle



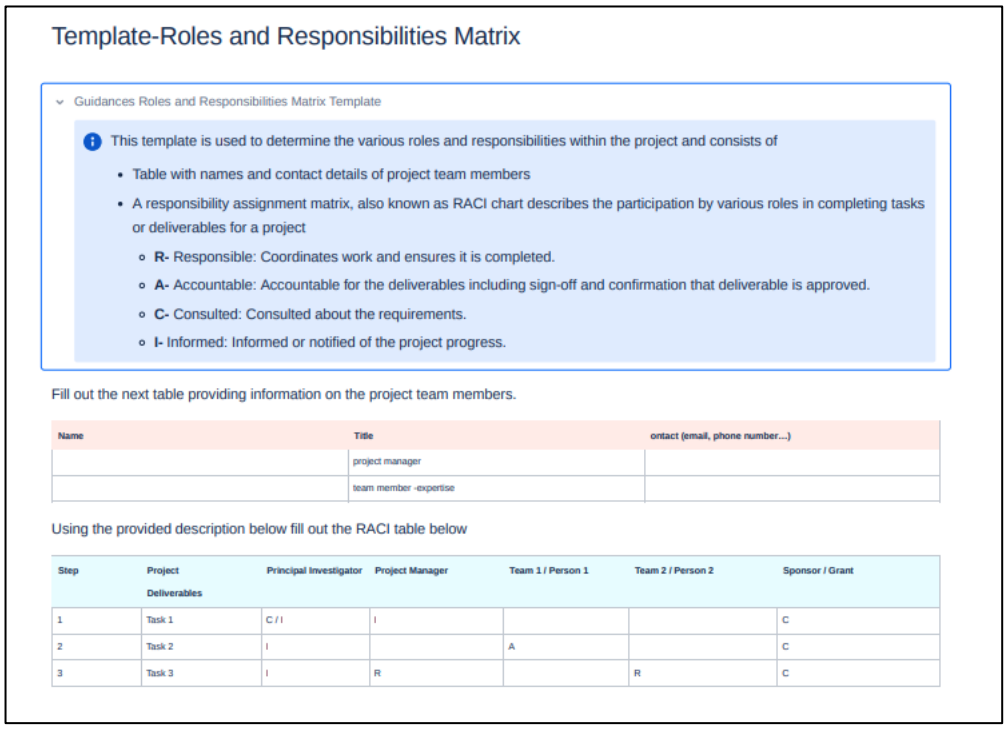
Note: These are the 11 templates created by SRPMM to follow in the workspace Blastrace to trace the research project from beginning to end (Salas, 2021).

Figure D3 Initiation Phase Templates Index :



Note: This one page of the template indicates what needs to be done in the initiation phase, the templates involved and the research type of documents that a Gilbert Laboratory often generates at the start of a project (Salas, 2021).

Figure D4 Roles and Responsibilities Matrix



Template-Roles and Responsibilities Matrix

Guidances Roles and Responsibilities Matrix Template

This template is used to determine the various roles and responsibilities within the project and consists of

- Table with names and contact details of project team members
- A responsibility assignment matrix, also known as RACI chart describes the participation by various roles in completing tasks or deliverables for a project
  - **R-** Responsible: Coordinates work and ensures it is completed.
  - **A-** Accountable: Accountable for the deliverables including sign-off and confirmation that deliverable is approved.
  - **C-** Consulted: Consulted about the requirements.
  - **I-** Informed: Informed or notified of the project progress.

Fill out the next table providing information on the project team members.

Name	Title	ontact (email, phone number...)
	project manager	
	team member -expertise	

Using the provided description below fill out the RACI table below

Step	Project Deliverables	Principal Investigator	Project Manager	Team 1 / Person 1	Team 2 / Person 2	Sponsor / Grant
1	Task 1	C / I	I			C
2	Task 2	I		A		C
3	Task 3	I	R		R	C

Note: In the kickoff meeting there should be a clarification of roles and responsibilities which this template allows the researchers to coordinate in the start of project (Salas, 2021).

Figure D5 Collaboration Communication Plan

Template-Collaboration Communication Plan

Guidances Stakeholder Management and Communication Plan

Instructions

- Stakeholders are any individual that has low to high influence in your research project and it's key to identify them since the beginning to create a clear communication plan throughout the process.
  - Describe how stakeholders are identified
  - Describe how the stakeholder expectations are analyzed
  - Describe how the stakeholder can impact the project
  - Describe how to manage stakeholders

Our stakeholders or collaborators

#	Stakeholder Name	Stakeholder role	Contact information (email, phone number)	Requirements	Expectations	Power Level	Interest Level

Power/Interest Grid

Power/Interest Grid

Keep Satisfied

Describe how to actively engage stakeholders during the project

1.

Manage Closely:

Describe how to actively engage stakeholders during the project

1.

Keep informed:

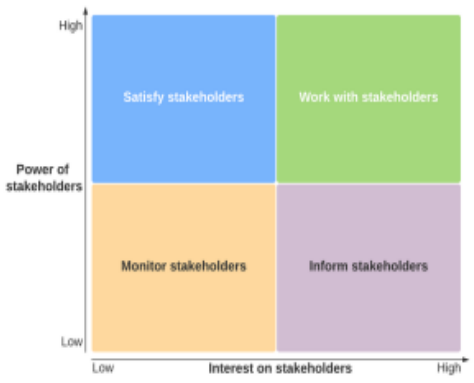
Describe how to actively engage stakeholders during the project

1.

Monitor:

Describe how to actively engage stakeholders during the project

1.



Research/Stakeholder	Communication method(s)

• e.g., project manager, team power, sponsors	• • e.g., one of one meeting • e.g., Emails • e.g., zoom meeting • e.g., slack, project management software

Comms plan goals:

- Fill out the communication strategy table based on communication plan (see PMP template) and stakeholder management. Keep track of communication using the Communication Log Template

Our comms cadence

Cadence / Frequency	Collaborators / Owner	Method / Channel	Information	Links to additional info
Daily				
Weekly	Project Manager (Researcher Name)	Email updates	Project updates	
Bi-Weekly				
Monthly				
Quarterly				
Yearly				
Ad Hoc				

Open actions

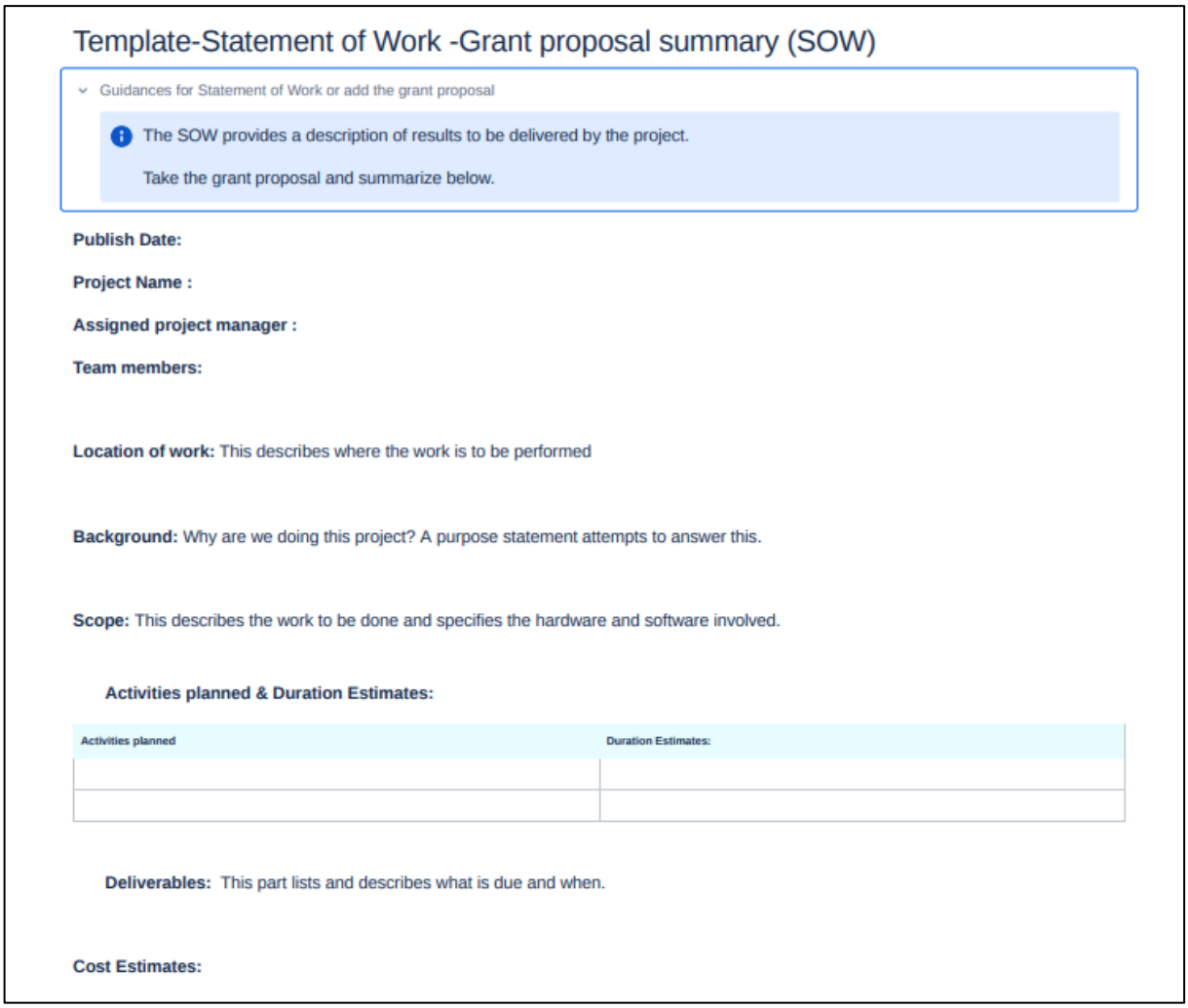
- [ ]

Concepts from Comms table

The stakeholder that is communicated to Owner: who is responsible for the communication **Information:** What need to be communicated to the stakeholder
Communication method and technology: oral/written Via electronic media of via printed paper
Frequency: How often communication will take place

Note: Throughout the developing a project is key the communication, thus making clear and the best method in the planning phase and this template (Salas, 2021)

Figure D6 Statement of Work -Grant proposal summary (SOW)



Template-Statement of Work -Grant proposal summary (SOW)

Guidances for Statement of Work or add the grant proposal

The SOW provides a description of results to be delivered by the project.

Take the grant proposal and summarize below.

Publish Date:

Project Name :

Assigned project manager :

Team members:

Location of work: This describes where the work is to be performed

Background: Why are we doing this project? A purpose statement attempts to answer this.

Scope: This describes the work to be done and specifies the hardware and software involved.

Activities planned & Duration Estimates:

Activities planned	Duration Estimates:

Deliverables: This part lists and describes what is due and when.

Cost Estimates:

[Files Distribution are based on how the workflow of the project from Initiation to Closing phase. Examples of documents created in each phase]

Initiation

- Information
  - GRANT
  - Objectives
  - Timeline
  - Receiving samples from collaborators
- Agreements MTA, IRB
- Financial Quote Invoice

Planning

- Sample Tracking
- Storage Location ie/Type of sample/Freezer/shelf/rack/box number/total number of samples
- Labeling (Tubewriter)
- Mapping Sample
- Loading
- Consumables Login

Execution

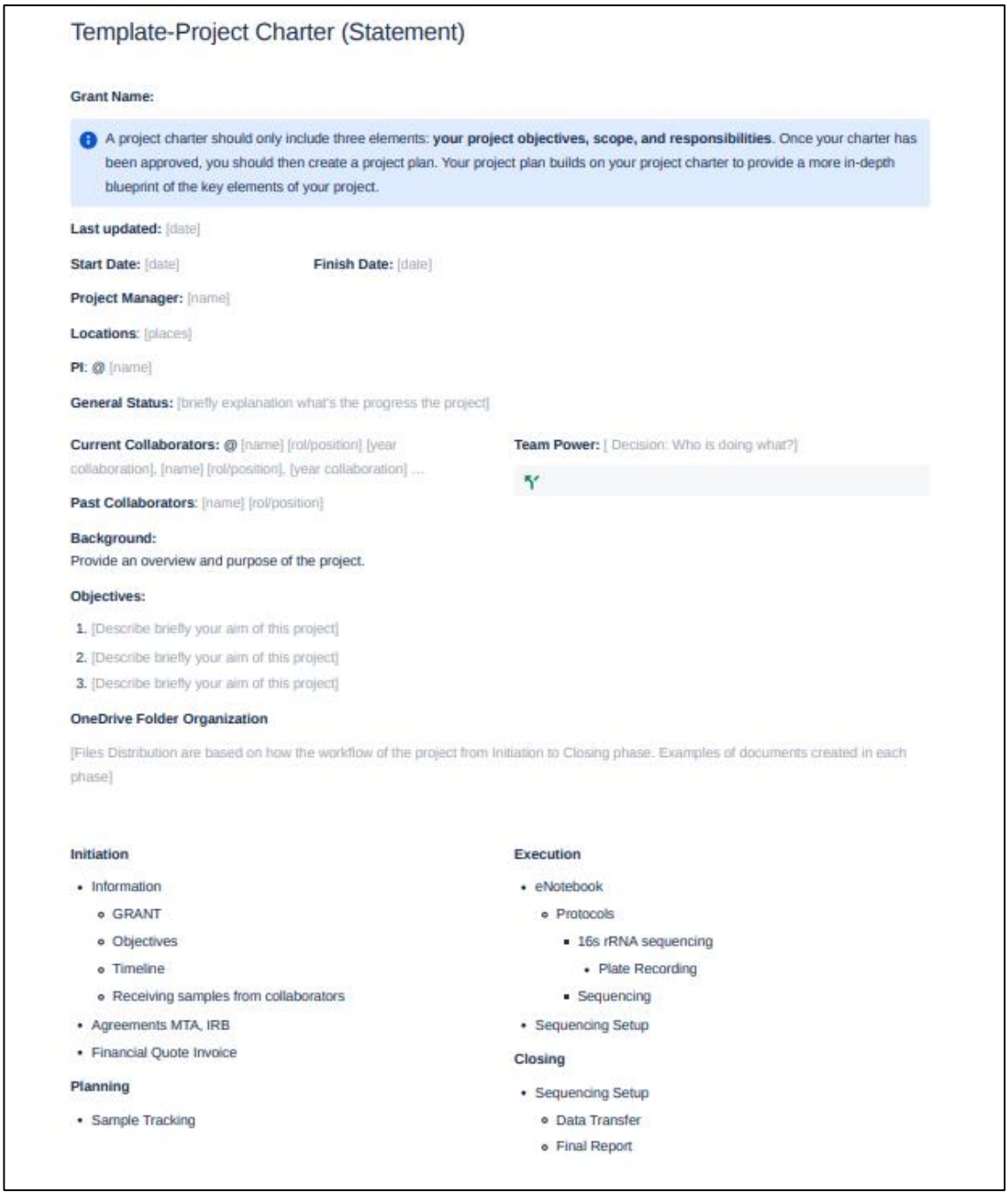
- eNotebook
  - Protocols
    - 16s rRNA sequencing
      - Plate Recording
    - Sequencing
- Sequencing Setup

Closing

- Sequencing Setup
  - Data Transfer
  - Final Report
  - Archived Project
  - Sequencing Tracking
  - Analysis
  - Paper

Note: The grant proposal is how the research project get the funding to get developed (Salas, 2021).

Figure D7 Project Charter (Statement)



Template-Project Charter (Statement)

Grant Name:

A project charter should only include three elements: **your project objectives, scope, and responsibilities**. Once your charter has been approved, you should then create a project plan. Your project plan builds on your project charter to provide a more in-depth blueprint of the key elements of your project.

Last updated: [date]

Start Date: [date] **Finish Date:** [date]

Project Manager: [name]

Locations: [places]

PI: @ [name]

General Status: [briefly explanation what's the progress the project]

Current Collaborators: @ [name] [rol/position] [year collaboration], [name] [rol/position], [year collaboration] ...

Team Power: [Decision: Who is doing what?]

Past Collaborators: [name] [rol/position]

Background:
Provide an overview and purpose of the project.

Objectives:

1. [Describe briefly your aim of this project]
2. [Describe briefly your aim of this project]
3. [Describe briefly your aim of this project]

OneDrive Folder Organization

[Files Distribution are based on how the workflow of the project from Initiation to Closing phase. Examples of documents created in each phase]

Initiation

- Information
  - GRANT
  - Objectives
  - Timeline
  - Receiving samples from collaborators
- Agreements MTA, IRB
- Financial Quote Invoice

Planning

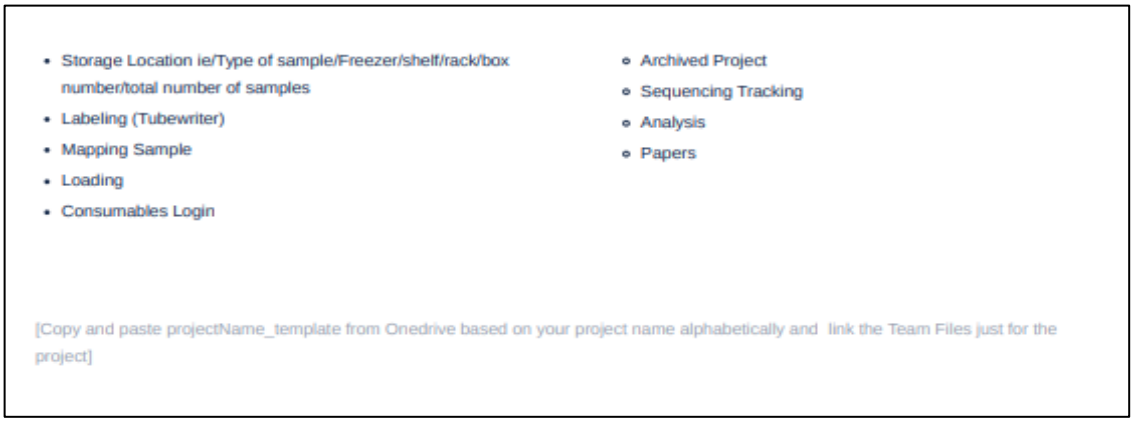
- Sample Tracking

Execution

- eNotebook
  - Protocols
    - 16s rRNA sequencing
      - Plate Recording
    - Sequencing
- Sequencing Setup

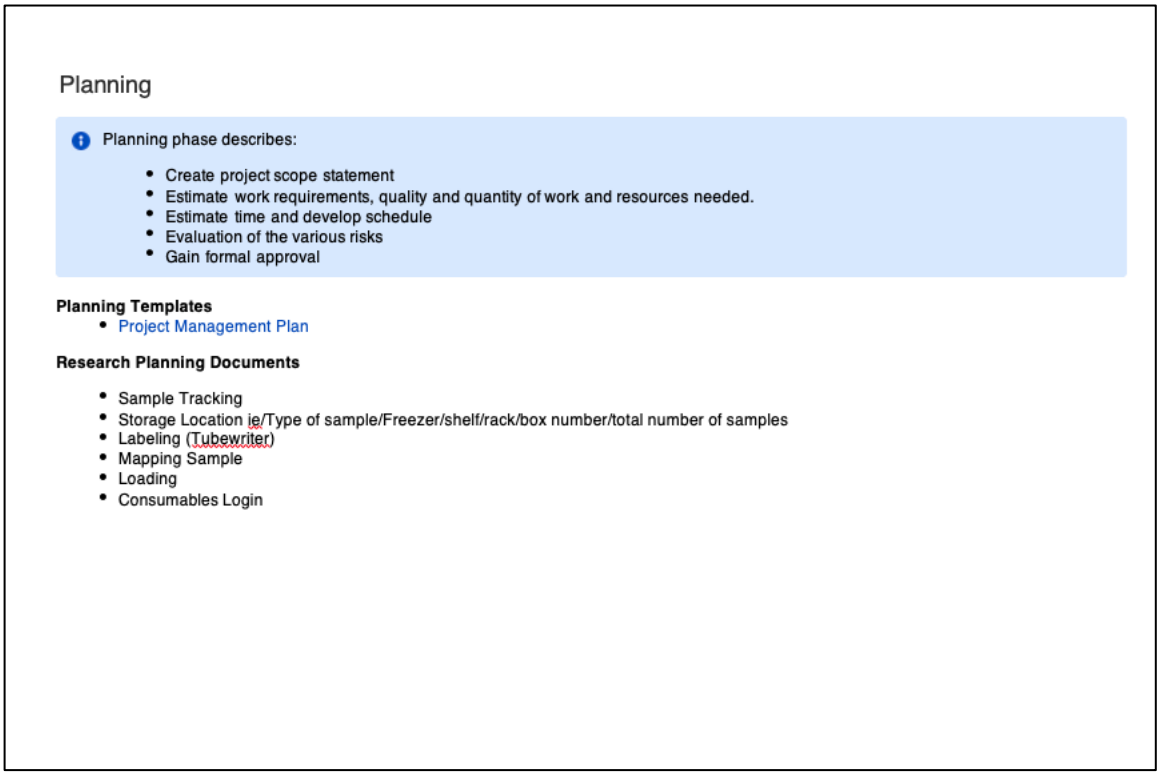
Closing

- Sequencing Setup
  - Data Transfer
  - Final Report



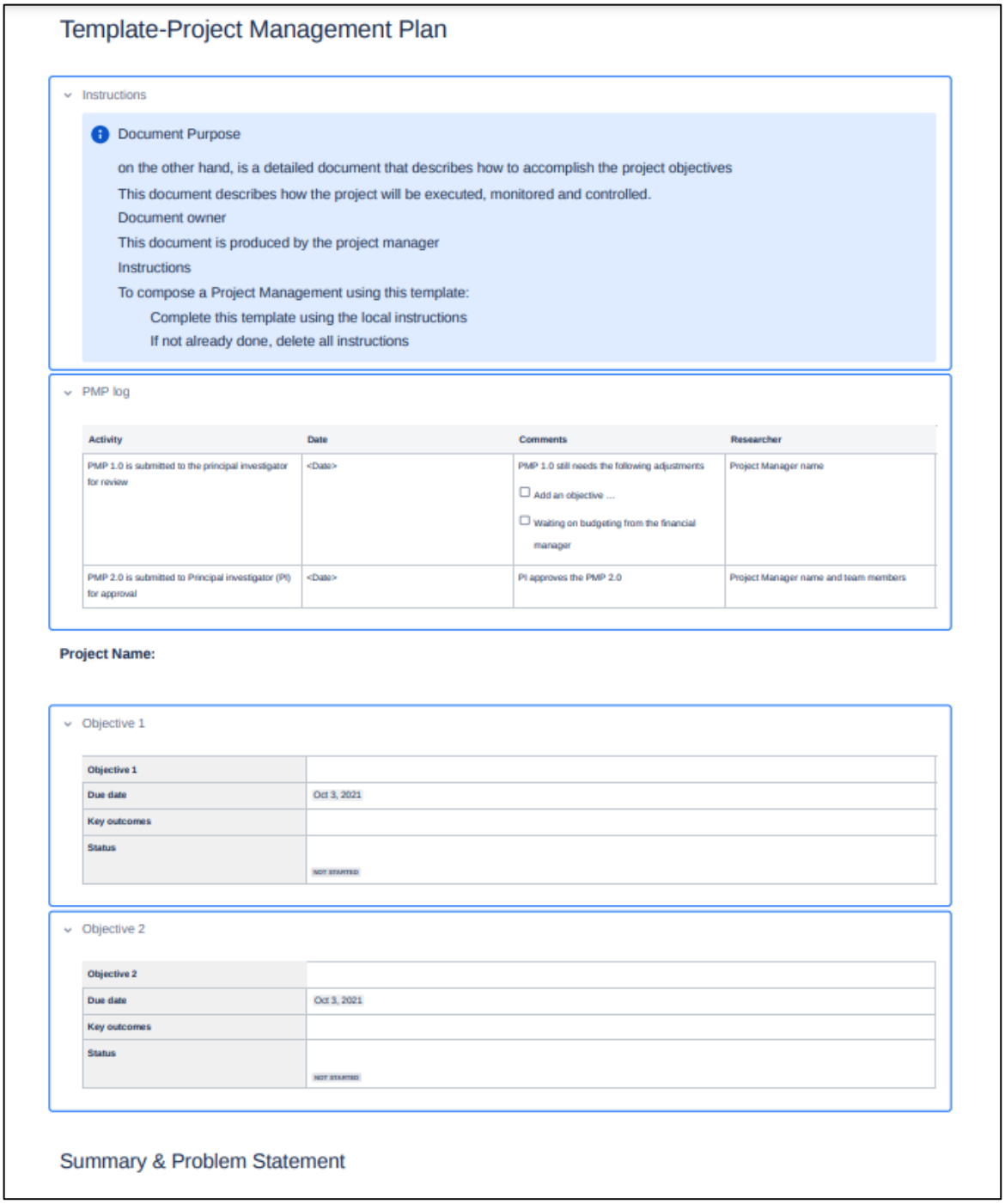
Note: The project charter shows the summary of the research project and outlines the key objectives (Salas, 2021).

Figure D8 Planning Phase index



Note: The overall list and content needs to be included in this planning phase (Salas, 2021).

Figure D9 Project Management Plan



Template-Project Management Plan

Instructions

Document Purpose

on the other hand, is a detailed document that describes how to accomplish the project objectives

This document describes how the project will be executed, monitored and controlled.

Document owner

This document is produced by the project manager

Instructions

To compose a Project Management using this template:

Complete this template using the local instructions

If not already done, delete all instructions

PMP log

Activity	Date	Comments	Researcher
PMP 1.0 is submitted to the principal investigator for review	<Date>	PMP 1.0 still needs the following adjustments ☐ Add an objective ... ☐ Waiting on budgeting from the financial manager	Project Manager name
PMP 2.0 is submitted to Principal investigator (PI) for approval	<Date>	PI approves the PMP 2.0	Project Manager name and team members

Project Name:

Objective 1

Objective 1	
Due date	Oct 3, 2021
Key outcomes	
Status	NOT STARTED

Objective 2

Objective 2	
Due date	Oct 3, 2021
Key outcomes	
Status	NOT STARTED

Summary & Problem Statement

Integration Management

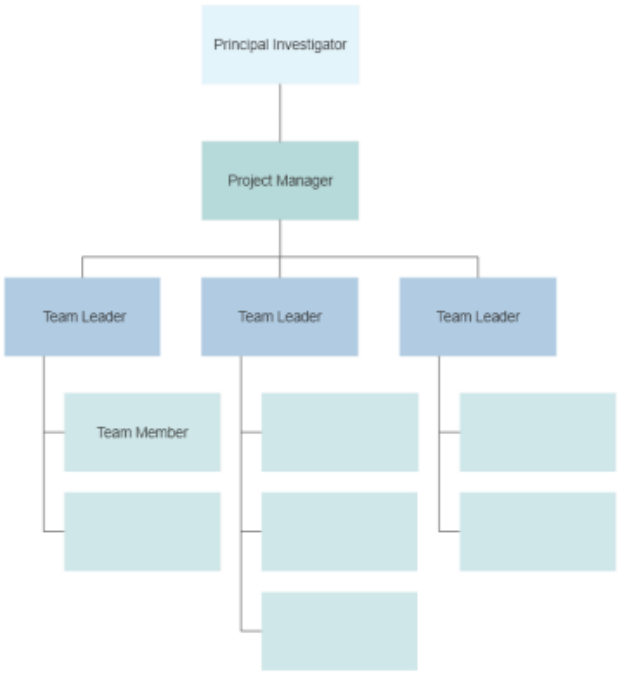
Driver / Project Manager	Approver	Contributors	Stakeholder

Scope Management

Describe the following:

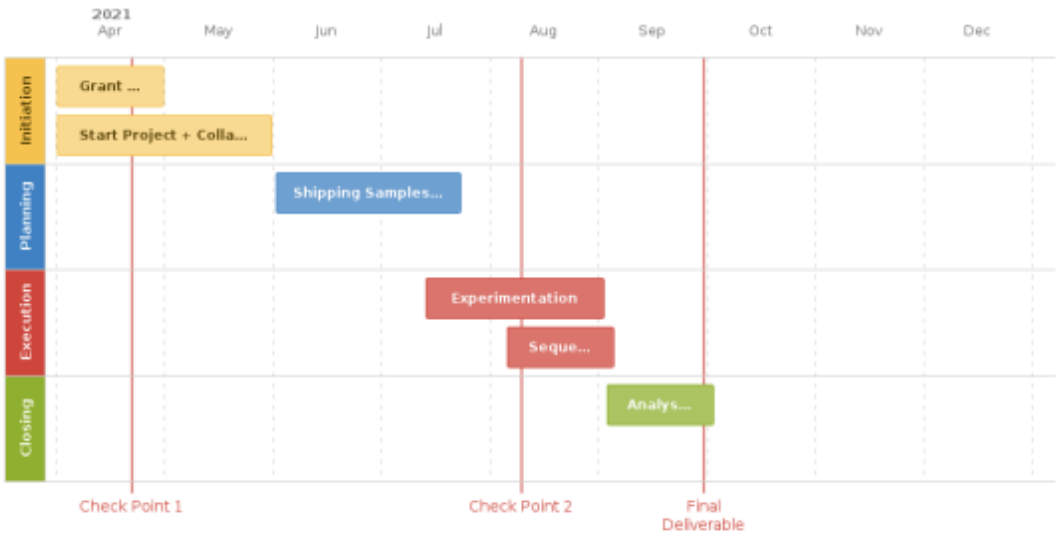
- What is within the scope of the project
- How will the scope be managed?
- What are the requirements that needs to be collected?
- Responsibilities of each team member
- Break down the project using the work breakdown structure (see Figure 14).
- List the project deliverables and the stakeholders that it must be delivered to.
- How the acceptance of completed deliverables will be formalized?
- Create a Work Breakdown Structure using the figure on the next page. Add/Remove units as necessary.

Project Governance and Project Team

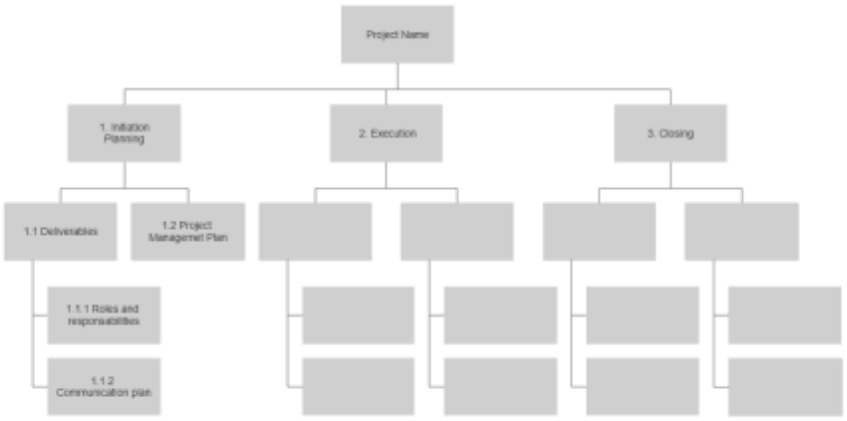


Roadmap Planner:

[Visualize your project objectives in a roadmap, create checkpoints for reviewing progress, and create goals in a timeline matter]



Work Breakdown Structure



#	WBS name	Description
1	Initiation	
1.1		

Milestones and deadlines

Specific deliverables the project will generate. These are related to the specific objectives and can be a product, service or result.

Milestone	Owner	Deadline	Status
			NOT STARTED

	Task	Assigned To	Start	End	Dur	2021 Oct	Nov	Dec	2022 Jan	Feb	Mar	Apr	May
	Project		10/19/21	5/19/22	153								
1	Initiation & Planning		10/19/21	2/24/22	93								
1.1	Deliverables		10/19/21	2/23/22	93								
1.2	Project Plan Management		10/19/21	2/27/22	96								
2	Execution		5/19/22	5/19/22	1								
2.1	Experiment		5/19/22	5/19/22	1								
3	Closure		5/19/22	5/19/22									

Reference materials

-
-
-
-

Sample Tracking

#	Kit ID	LF Sample	Freezer Bag	Freezer Location

Budget Tracking

Describe the various costs associated with activities from the scope plan, including how the cost is determined.
Describe how planned funds will be requested

- Describe the procedure for requesting funds
- Describe procedure for procurement (if necessary)

Expenses			
Category	Planned Budget	Actual Amount Spent	Explanations
Sample kits			
Wet Lab supplies			
Bioinformatics			
Sequencing			
Office Supplies			
Total			

Procurement

Overview of supplies and if you want request supplies please use the link

Assumptions:

Describes the resources that are assumed to be available.

Constraints:

Describe the constraints that might restrict or limit the project from progressing.

Preliminary risk:

Describe any identified risk

OneDrive Folder Organization

[Files Distribution are based on how the workflow of the project from Initiation to Closing phase. Examples of documents created in each phase]

Request Supplies

To Order	Project/Business Pur...	Requested Day of Ar...	Status	Catalog Number	Cost per Supply	Description	How many?	Cost of the order	Ship To Location
					$0 sum		0 sum	$0 sum	
Order Submitted - CHANGE STA...	**Project/Business Pur...**	**Requested Day of Ar...**	**Status**	**Catalog Number**	**Cost per Supply**	**Description**	**How many?**	**Cost of the order**	**Ship To Location**
HOBO Pendant® MX Water Temperatur...	Oyster Microbiome PAH	-	Ordered	https://www.onsetcomp.com/produ...	$59		1	$59	SIO Lab (2070)
1L beakers	MPVibrio	-	Ordered	02-555-113	$52.18	per 6 pack	4	$208.72	SIO Lab (2070)
tips 20ul 100ul 1000ul		-	Ordered					$0	
usb micro cables	Novozymes	Sep 27 - Oct 1	Ordered	https://www.amazon.com/dp/B00N...	$7.08		2	$14.16	SIO Lab (2070)
TIPS	general lab needs	-	Ordered					$0	
HOBO Temp/RH 2.5% Data Logger	Novozymes	-	Ordered	UX100-011A	$135	per piece	5	$675	SIO Lab (2070)
Hot hands glassware handler	general lab needs	-	Ordered	https://www.schoolspecialty.com/s...	$20.09	lab safety equipment	2	$40.18	SIO Lab (2070)
Chromagar	MPVibrio	Oct 11	Ordered	Chromagar Vibrio	$299.59	25 L (VB913-25)	1	$299.59	SIO Lab (2070)
Petri Dishes	general lab needs	-	Ordered	FB0875713	$301.5		2	$603	SIO Lab (2070)
Pyrene (185515-1G) - 1G	Oyster Microbiome PAH	-	Ordered	https://www.sigmaaldrich.com/US/...	$19.2		1	$19.2	
Fluorene (128333-5G)	Oyster Microbiome PAH	-	Ordered	https://www.sigmaaldrich.com/US/...	$34.5		1	$34.5	
Biohaz bags, small	general lab needs	-	Ordered	https://www.sigmaaldrich.com/US/...	$244.53	case	3	$733.59	SIO Lab (2070)
pipets 3 set single channels	general lab needs	-	Ordered		$3,100			$0	SIO Lab (2070)
Alfa Aesar™ Ofloxacin, Thermo Scientifi...	NASA	-	Ordered	AAJ6208003	$35.45	1g	1	$35.45	SIO Lab (2070)
Alfa Aesar™ Norfloxacin, Thermo Scient...	NASA	-	Ordered	AAJ6265203	$20.5	1g	1	$20.5	SIO Lab (2070)

[Files Distribution are based on how the workflow of the project from Initiation to Closing phase. Examples of documents created in each phase]

Initiation

- Information
  - GRANT
  - Objectives
  - Timeline
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- Agreements MTA, IRB
- Financial Quote Invoice

Planning

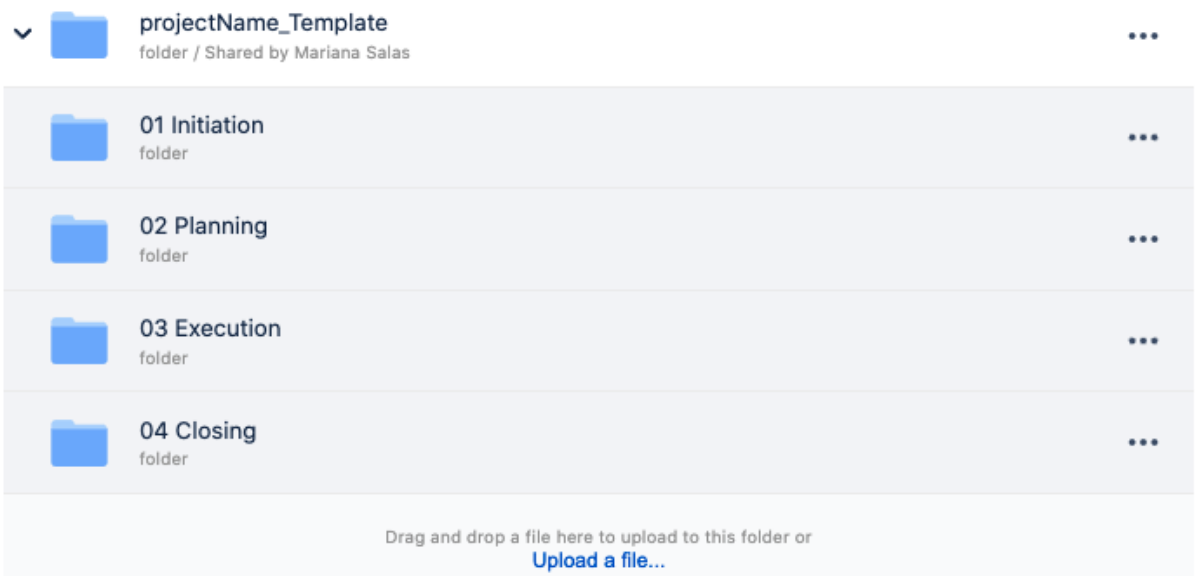
- Sample Tracking
- Storage Location ie/Type of sample/Freezer/shelf/rack/box number/total number of samples
- Labeling (Tubewriter)
- Mapping Sample
- Loading
- Consumables Login

Execution

- eNotebook
  - Protocols
    - 16s rRNA sequencing
      - Plate Recording
    - Sequencing
- Sequencing Setup

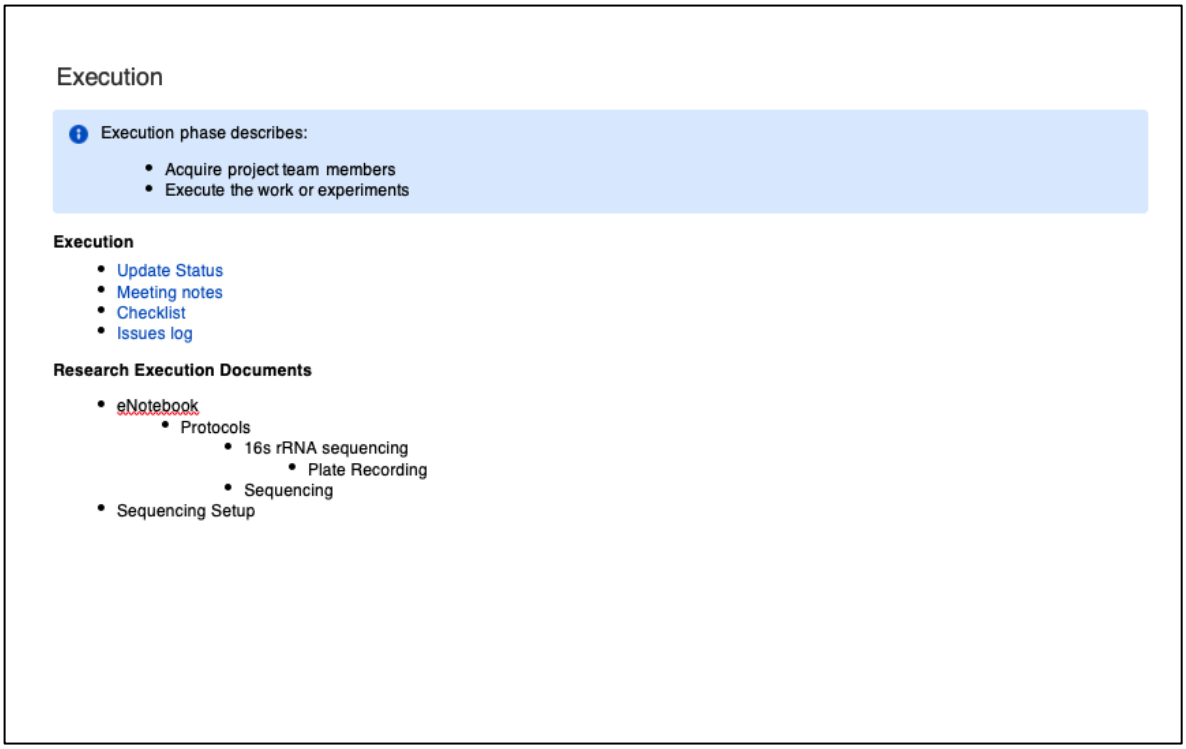
Closing

- Sequencing Setup
  - Data Transfer
  - Final Report
  - Archived Project
  - Sequencing Tracking
  - Analysis
  - Paper



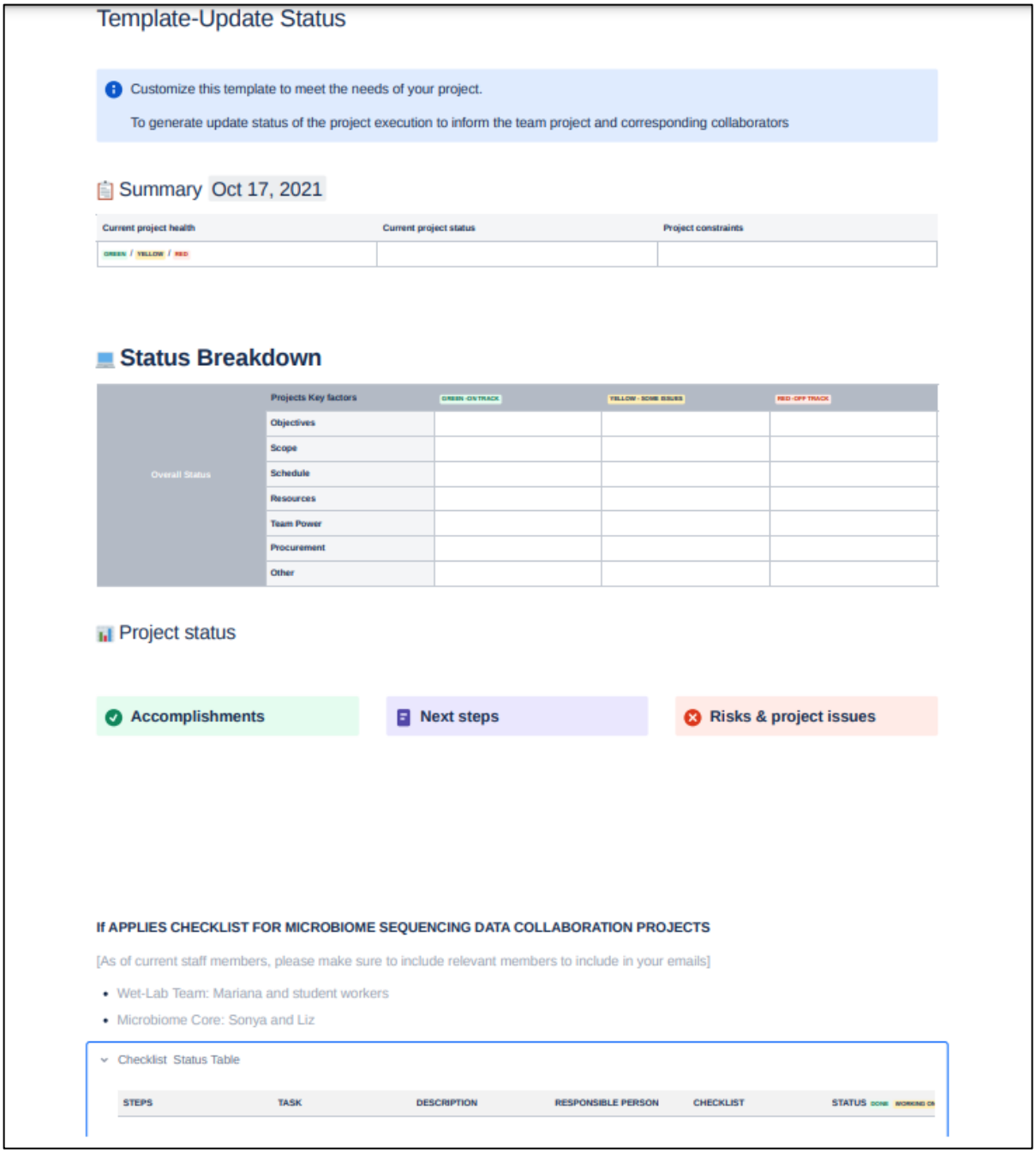
Note: The project management plan encompasses every detail for planning and developing the project (Salas, 2021).

Figure D9 Execution Phase Index



Note: The overall list and content needs to be included in this execution phase (Salas, 2021).

Figure D10 Update Status



Template-Update Status

Customize this template to meet the needs of your project.

To generate update status of the project execution to inform the team project and corresponding collaborators

Summary Oct 17, 2021

Current project health	Current project status	Project constraints
GREEN / YELLOW / RED		

Status Breakdown

	Projects Key factors	GREEN -ON TRACK	YELLOW - SOME ISSUES	RED -OFF TRACK
Overall Status	Objectives			
	Scope			
	Schedule			
	Resources			
	Team Power			
	Procurement			
	Other			

Project status

Accomplishments | Next steps | Risks & project issues

If APPLIES CHECKLIST FOR MICROBIOME SEQUENCING DATA COLLABORATION PROJECTS

[As of current staff members, please make sure to include relevant members to include in your emails]

- Wet-Lab Team: Mariana and student workers
- Microbiome Core: Sonya and Liz

Checklist Status Table

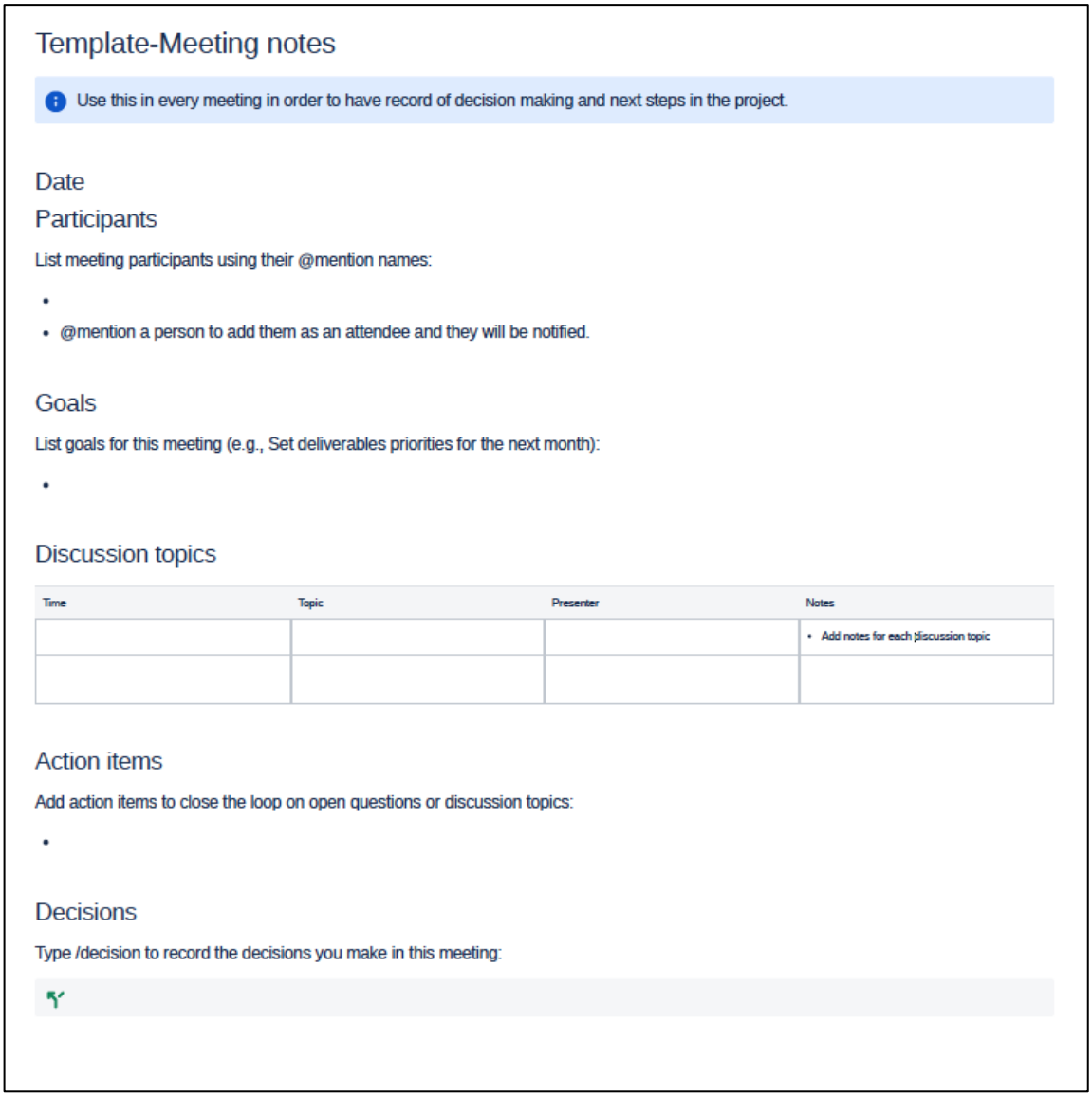
STEPS	TASK	DESCRIPTION	RESPONSIBLE PERSON	CHECKLIST	STATUS DONE WORKING ON

1	Sample Dispatch	Either swabs or tubes in a batch of 88 maximum samples per packet	Wet-Lab Team	Proof of picture confirming the condition of arrival and add it to project record	
	Arrival Mode	Either all-at-once or roll-in-basis	Wet-Lab Team	Confirm the quantity and names of samples with the Collaborator	
	Sequencing Type	16S/Shallow-shotgun/Deep-shotgun	Wet-Lab Team	Confirm with Jack and Collaborator	
	Processing Location	Microbiome Core/Gilbert Lab	Wet-Lab Team	Confirm with Jack and Collaborator	
2	Master List	Single spreadsheet with column names (sample name, well number, description) in every sheet for each plate in vertical format	Wet-Lab Team or Microbiome Core	Cross-check with random n samples in each sheet	
	Pico Green	Single spreadsheet with map of 96-well plate, into entered with DNA conc. of each plate in every sheet in horizontal format	Wet-Lab Team or Microbiome Core	Check for outlier signal Cross-check with random n samples in each sheet Confirm with Collaborator	
	Pooling	High biomass - concentration-based pooling Low biomass – equal volume-based pooling	Wet-Lab Team or Microbiome Core	Check for outlier signal Cross-check with random n samples in each sheet	
	Sequencing Lanes	Concatenation of plate-specific pools into lanes. Note: Each run has max of 2 lanes	Wet-Lab Team or Microbiome Core	Check the naming and format of the form submission to IGM	
	Sample-Prep Info	Creation of prep-info file (qiita format with minimal columns provided)	Wet-Lab Team or Microbiome Core	Cross-check with random n samples w.r.t original document once compiled	
	Processing Duration	Approx. 100 samples ~ 3 weeks Note: time varies based on the queue	Wet-Lab Team or Microbiome Core	Email if 3 weeks passed with zero response	
	Sequencing Duration	Approx. a month for batch submission of projects Note: time varies based on the queue	IGM	Email if 3-4 weeks passed with zero response	
3	Data Analyst	Jack announces the new project, either a volunteer or relevant person gets assigned	Wet-Lab Team or Microbiome Core	Forwards the past email thread for history reference	
	Blastrace	The profile of project management system is updated with the assigned person's email	Wet-Lab Team	Update the contact person in the project's profile page in Blastrace	
4	Sequencing Data - Ready	The raw and converted data files are uploaded in Barnacle	Mariana and Jeff		
	Qiita	A qiita ID is created with a copy of the sequencing data uploaded	Mariana	Add Mariana's email as Lab Manager Add Jack's email as PI	
	Email Confirmation	Send email to Project Lead once the upload is complete	Mariana	CC Jack and Collaborators	
	Metadata and Data Analysis	Collaboration through meetings or emails Note: Mandatory analysis of 16S and shallow-shotgun data through qiita	Project Lead and Jack	Personalized Work Style	
	Quality Assurance	Approx. 1 month to determine if re-processing or re-sequencing required	Project Lead	Email Mariana and Jack	

5	Sample Recycling	Ship samples back to Collaborators or Clear the samples from freezer if collaborators confirm discard	Project Lead	Seek approval from Collaborator and Jack followed by confirming Mariana	
	Data Transfer through qiita	Share the qiita project ID with Collaborator	Project Lead	Email the Collaborator	
	Data Transfer through Globus	Share the location of raw data files in Barnacle	Project Lead	Email Jeff and CC Mariana and Jack with path to the converted data in Barnacle	

Note: The update template allows to understand the progress of the project (Salas, 2021).

Figure D11Minutes Meeting



Template-Meeting notes

Use this in every meeting in order to have record of decision making and next steps in the project.

Date

Participants

List meeting participants using their @mention names:

-
- @mention a person to add them as an attendee and they will be notified.

Goals

List goals for this meeting (e.g., Set deliverables priorities for the next month):

-

Discussion topics

Time	Topic	Presenter	Notes
			• Add notes for each discussion topic

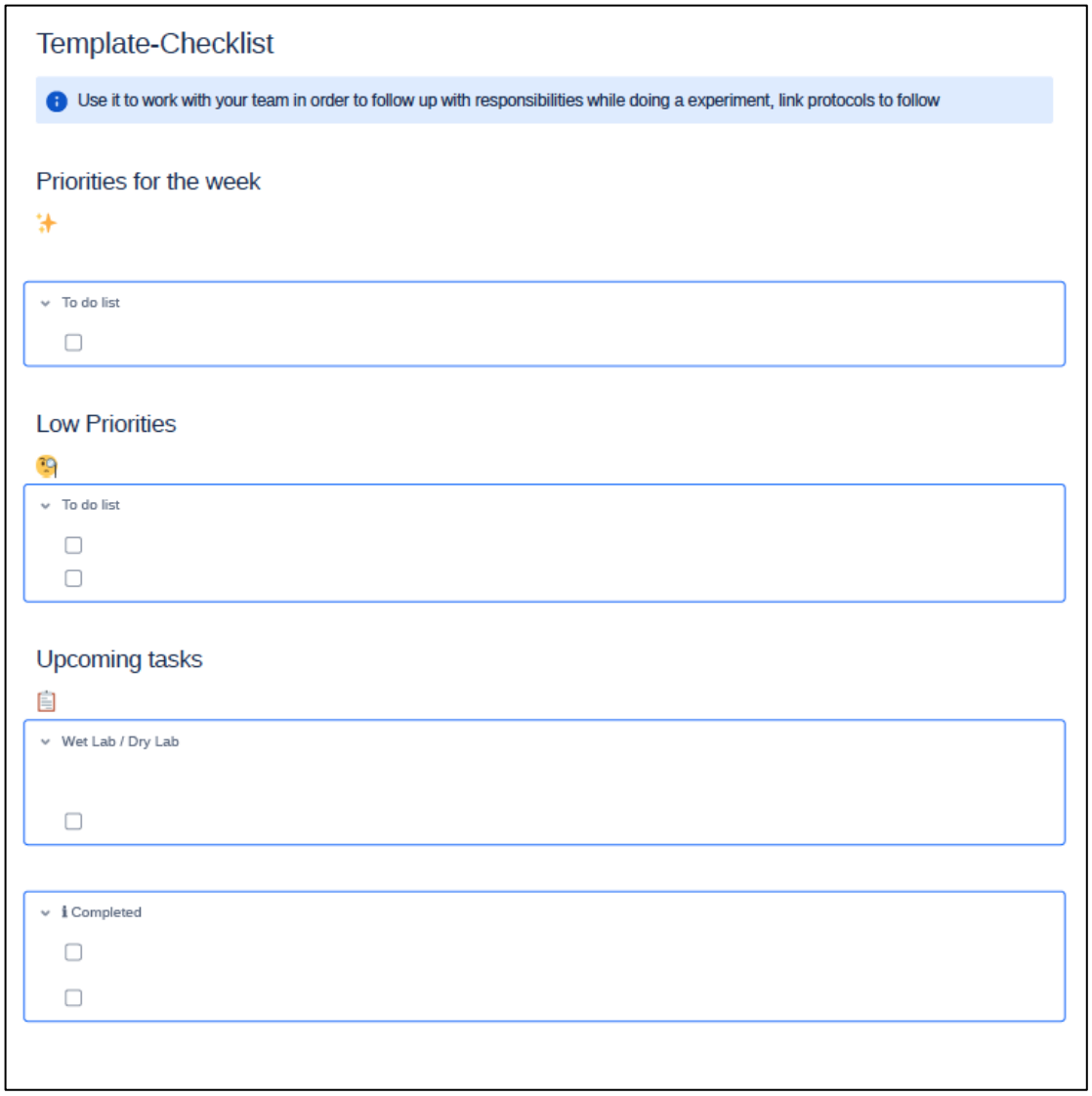
Action items

Add action items to close the loop on open questions or discussion topics:

-

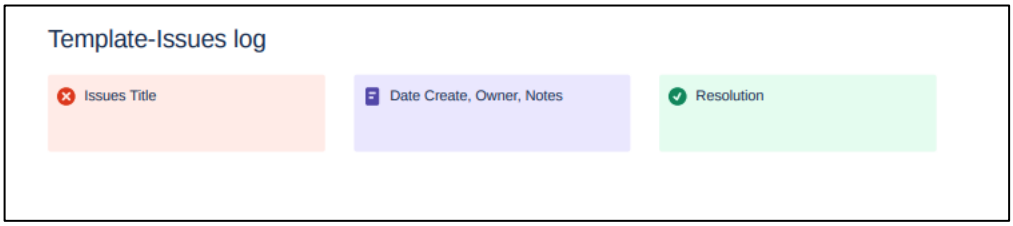
Decisions

Type /decision to record the decisions you make in this meeting:



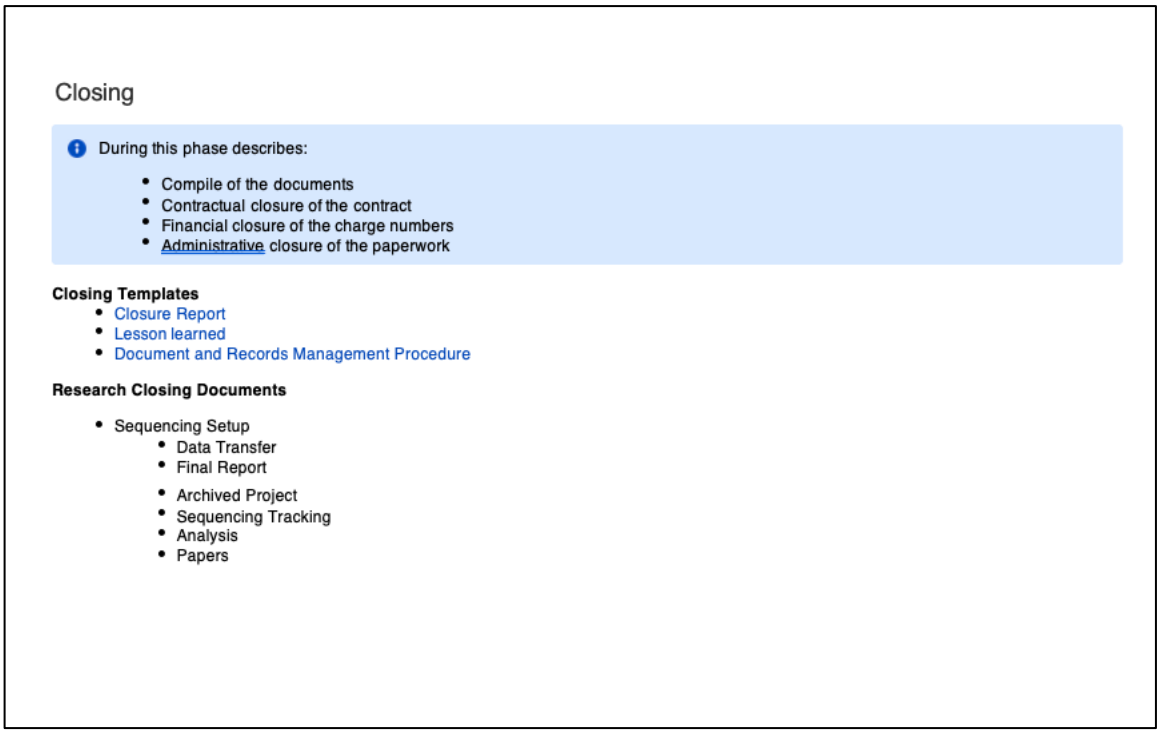
Note: The meeting notes are used across the life cycle of the project and give directions on the next things to get done, which includes a to do list to follow up after a meeting (Salas, 2021).

Figure D12 Issues Log



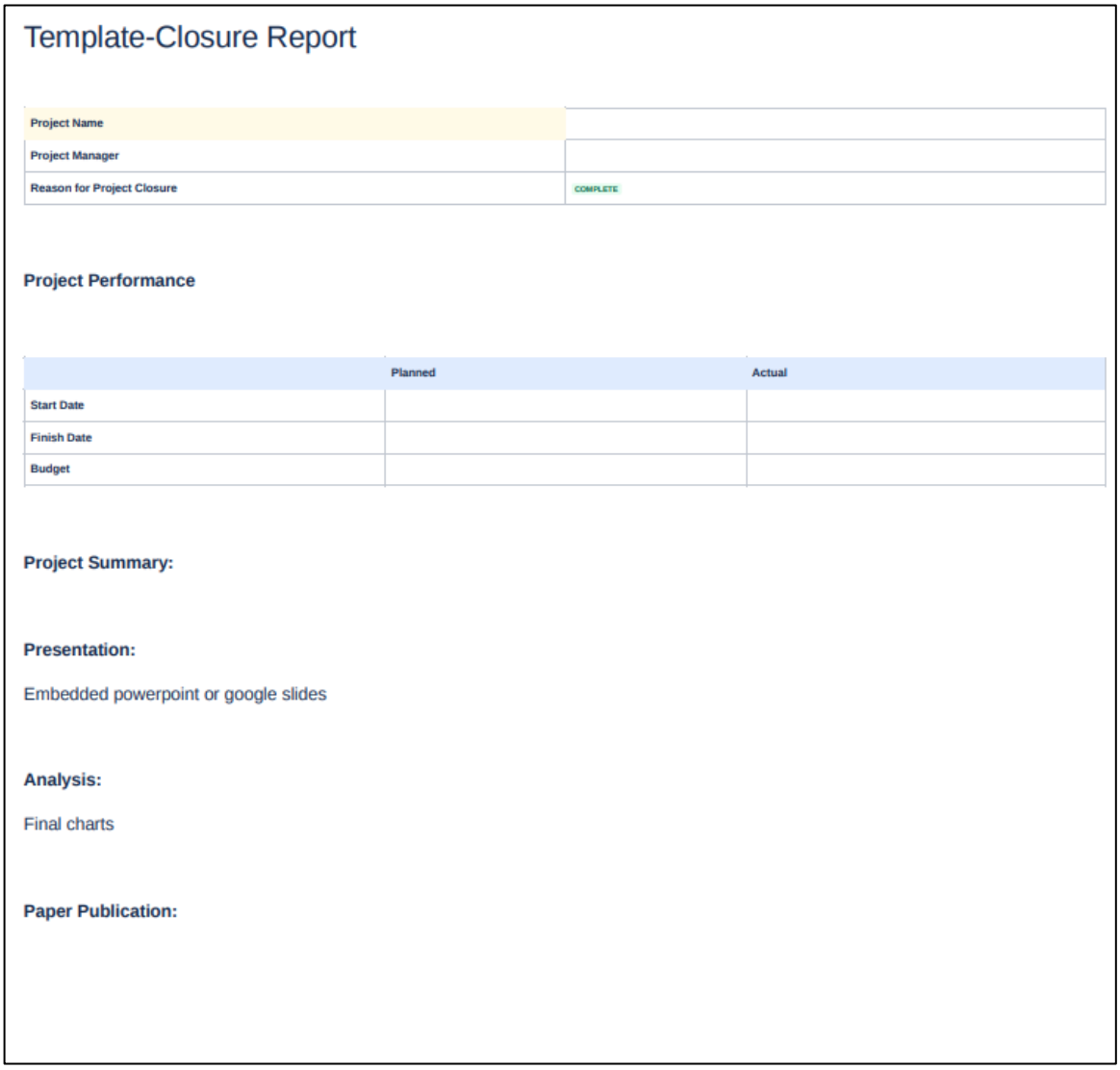
Note: Throughout the project there are going to be issues and needs to be problem solving, this document allows to trace any issue that arises and how it was solved.

Figure D13 Closing Phase Index



Note: The overall list and content needs to be included in this closure phase.

Figure D14 Closure Report



Template-Closure Report

Project Name	
Project Manager	
Reason for Project Closure	COMPLETE

Project Performance

	Planned	Actual
Start Date		
Finish Date		
Budget		

Project Summary:

Presentation:

Embedded powerpoint or google slides

Analysis:

Final charts

Paper Publication:

Note: The final report of all the results of the project can be added in this template and shows key aspects to report (Salas, 2021) .

Figure D15 Document and Records Management Procedure

Template-Document and Records Management Procedure

Add any other document that has been created during the project to track back

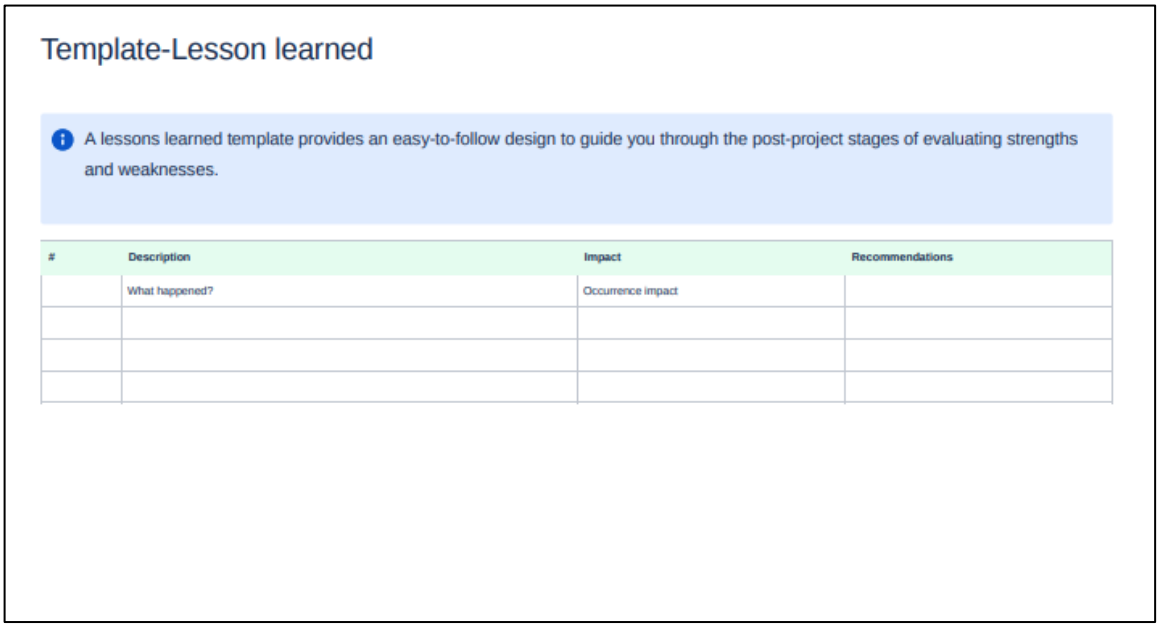
Sequencing run

typeRun	namesRuns	runGL_ID	projectsperRun	fullPath	Fastq	qiita_path

Element	Document Description	Retention Time	Location
• Statement of Work -Grant proposal summary (SOW)	Grant proposal and summary	Infinite -just archive	OneDrive -Initiation folder
• Roles and Responsibilities Matrix			
• Collaboration Communication Plan			
• Project Charter (Statement)			
• Project Management Plan			
• Meeting notes			
• Checklist			
• Update Status			
• Issues log			
• Lesson learned			
• Document and Records Management Procedure			

Notes: Includes a repository of documents and locations for future reference (Salas, 2021).

Figure D16 Lesson Learned



Note: Includes all the lessons expected and unexpected that happen throughout the project (Salas, 2021) .

Appendix E Scientific Research Project Management Implementation Plan

Project Management Plan

Project Name: Scientific Research Project Management Methodology Implementation Plan

Project Manager: Mariana Salas Garcia

Purpose

The Scientific Research Project Management Methodology describes how this tool will be implemented, monitored, and controlled.

Document Owner

This document is produced by Mariana Salas Garcia and is owned by Blastrace Inc. consulting and developed for Gilbert Laboratory, University of California, San Diego.

Chart E1 SRPMM Implementation Log

Activity	Date	Comments	Stakeholder
1	10/5/21	Writing of the implementation plan	PM

Note: The log is to track who has been added to the plan

Background

The Gilbert Laboratory, University of California, San Diego is constantly growing and as result, the laboratory not only needs to perform on existing grants approved based on scopes, time, and budget, but it also acquiring more projects.

It's essential to seek a solution to a growing laboratory and its challenges, thus a project management methodology named Scientific Research Project Management Methodology also known as SRPMM has been developed for this reason.

The purpose of SRPMM is to

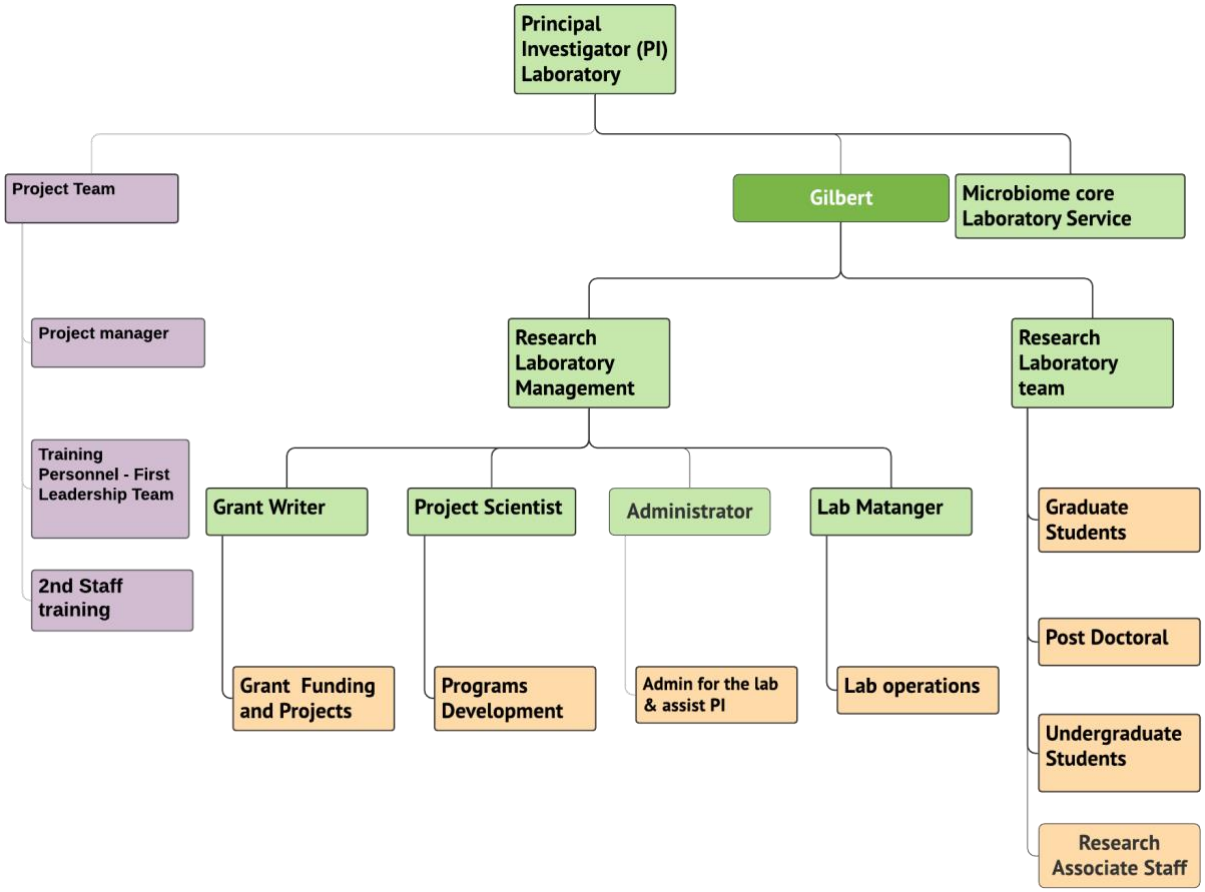
- build a successful project management culture that will enable effective utilization of project management methodology.
- standardize the project management approach, reducing the need to reinvent project management tools and techniques each time and to create a common framework of reference.
- allow the research laboratory to adapt to new challenges with minimum resources invested.
- increase their motivation and productivity throughout each project.
- successfully deliver projects within the time, budget, scope, and quality constraints.
- reduce the risk of project failure.
- keep all collaborators satisfied.

Integration Management

Project Governance and Project Team

Below chart shows the Gilbert Laboratory team and how they will be trained, starting first with the management team and proceeding with the entire team.

Figure E1 SRPMM Implementation Governance



Note: The Figure shows the big scheme governance of the Gilbert Laboratory and roles (Salas, 2021) .

Change Request for Methodology

Adjustment requests can be issued by the project manager in consultation—this could be a post-doctoral, graduate student or staff with project team members— with the goal of allowing a better workflow on how to these methods for their projects. The project manager is responsible for correctly implementing the changes throughout the project.

Close Project or Phase

At the end of each phase, the project deliverables must be submitted to principal investigator or project scientist for approval. After the execution phase is finished, a final report containing project results and details must be submitted to PI for approval and closing of the project. Once approval from PI or research team leader is obtained, the project team updates the lessons learned which are compiled and final presentation will create the conclusion of the project how SRPMM was implemented and move the documentation to project completed and archiving.

Scope Management

The scope of this project is to implement SRPMM for managing any research projects for Gilbert laboratory as a multidisciplinary research laboratory.

This will be achieved by the following steps:

a. Establish a project team, which will support the implementation of SRPMM.

b. Identify and initiate a Pilot Project to test SRPMM.

    i. Identify early issues of the methodology during Pilot Project.

    ii. Adjust SRPMM where necessary.

    iii. Demonstrate small scale success of SRPMM by delivering a successful Pilot Project.

c. Progressively implement SRPMM by training of personnel.

d. Document the methodology by communicating all project documents to PI and leadership team for future use in the laboratory.

To help guide the Pilot Project, a scenario project named Rothia Sars-Covid has been detailed and included in Appendix F.

Requirements

Before implementing SRPMM, a trainee from Gilbert Laboratory will receive general project management training from an external source, in this case, Blastrace Inc consulting. Afterwards, the trainee can use the knowledge gained to educate their colleagues at Gilbert Laboratory.

To implement SRPMM requires identification of the number of personnel that need to be trained as shown Chart below.

Chart E2 Identified number of personnel that will be trained

Department	**Number of identified trainees**	**Sum**
Number of personnel trained by external training provider	1	1
Principal Investigator	1	
Project Scientists	2	
Administrator	1	
Grant Writer	1	
Laboratory Manager	1	22
Post-doctoral	3	
Graduate Students	6	
Laboratory Assistants	5	
Staff Research Associates & Fellows	2	

Note: All the stakeholders involved in the implementation of the SRPMM (Salas, 2021).

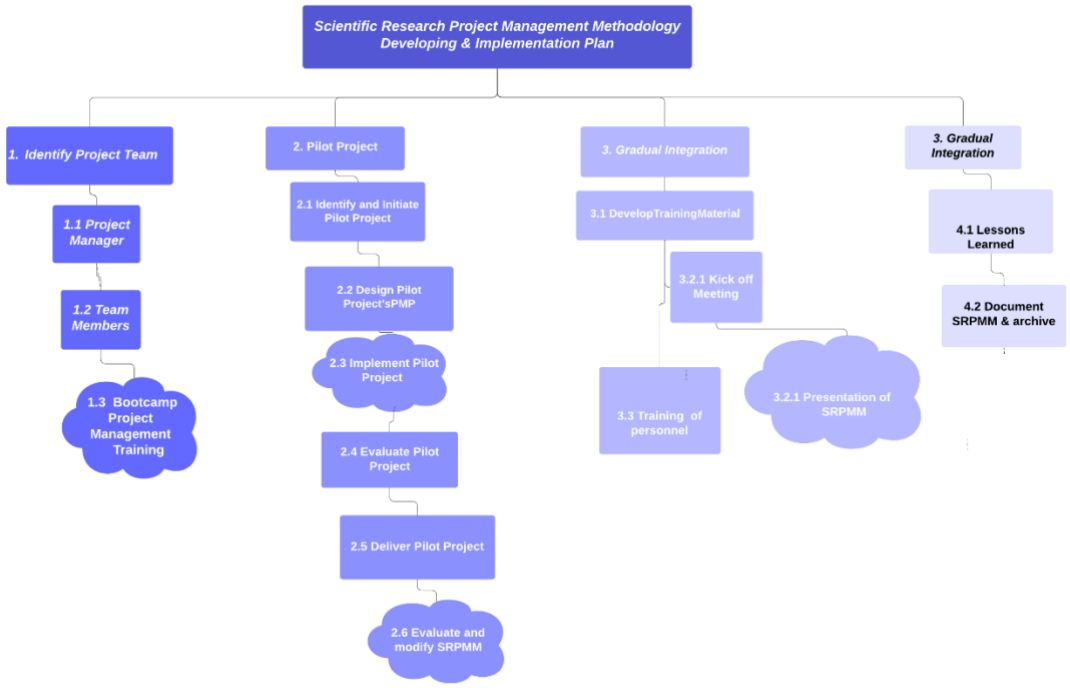
Chart E3 SRPMM Implementation WBS dictionary

#	WBS name	Description
1	Establish Project Team	**Identify the SRPMM Project Team**
1.1	Project Manager	**This is SPRMM rollout project manager**
1.2	Team Members	**Identify 2 personnel of Gilbert Laboratory who will help to implement SRPMM**
1.3	General Project Management Training	**This a training catered toward team members of SRPMM for better understanding with Project Management Concepts**
2	Pilot Project	**The Pilot Project serves as small scale on how to execute the SRPMM**
2.1	Identify and Initiate Pilot Project	**The Initiation phase of the Pilot Project**
2.2	Planning Pilot Project's PMP	**The Planning Phase of the Pilot Project**
2.3	Implement Pilot Project	**The Execution Phase of the Pilot Project**
2.4	Evaluate Pilot Project	**The Updates Phase of the Pilot Project**
2.5	Deliver Pilot Project	**The Closure Phase of the Pilot Project**
2.6	Evaluate and adjust SRPMM	**During the execution of the Pilot Project, SRPMM will be monitored and adjusted where necessary**
3	Gradual Implementation of SRPMM	**The gradual rollout of the application of SRPMM**
3.1	Develop Training Material	**Using the gained knowledge, the project team develops training material for Gilbert Lab**
3.2	Kickoff Meeting	**Kickoff Meeting to formally announce execution ofSRPMM**
3.2.1	Presentation of SRPMM	**Present a high-level description of SRPMM**
3.3	Training of personnel	**General Project Management training and training on how to implement SRPMM**

4	Closure	**Necessary Steps for Project Closure**
4.1	Lessons Learned	**Write Lessons Learned**
4.2	DocumentSRPMM	**Communicate all document to PI forarchiving**

Note: The chart shows the clear activities to implement the SRPMM in the laboratory (Salas, 2021).

Chart E4 SRPMM Implementation WBS dictionary



Note: The Chart shows an overview of all the steps to follow to develop and implement the SRPMM (Salas, 2021).

Time Management

Thelist of activities and timeline is included in the Gantt Chart below. The Gantt chart will be used as a tool for tracking project progress.

Duration Estimates

The most common duration for a training is 6 to 8 weeks at least for certification, but the duration of this customize General Project Management Training is expected to last 5 days throughout zoom meetings.

The Pilot Project that the project team will conduct is expected to last 30 days. Since the training will be carried out by trainees from the gilbert laboratory, it is estimated that they will require 10 days to develop the training material.

The training of personnel will last 5 days:

Number of trainees per group 22

Writing Lessons Learned and SRPMM is estimated to last 5 days.

128

Figure E2 Work

breakdown

Structure

Project Manager:TBD

Project Start Date			**TBD**	**Planned**			**Actual**			**M**	**T**	**W**	**T**	**F**	**M**	**T**	**W**	**T**	**F**	**M**	**T**	**W**	**T**	**F**
WBS	Activity	Owner	Prede-cessor	Duration (days)	Start	End	Duration	Start	End	**Day 1**	**Day 2**	**Day 3**	**Day 4**	**Day 5**	**Day 6**	**Day 7**	**Day 8**	**Day 9**	**Day 10**	**Day 11**	**Day 12**	**Day 13**	**Day 14**	**Day 15**
1	**Establish Project Team**			**7**																				
1.1	Assign Project Manager	PI		1																				
1.2	Assign Team Members	PI		1																				
1.3	General Project Management Training	PT	1.2	5																				
2	**Pilot Project**			**30**																				
2.1	Identify and Initiate Pilot Project	PM PT	1.2	1																				
2.2	Plan Pilot Project's PMP	PT	2.1	5																				
2.3	IExecute Pilot Project	PT	2.2	5																				
2.4	Monitor Pilot Project	PT	2.2	4																				
2.5	Deliver Pilot Project	PT	2.4	5																				
2.6	Evaluate and adjust SRPMM	PT PI	1.2	10																				
3	**Implementation of SRPMM**			**17**																				
3.1	Develop Training Material	PT	2.6	10																				
3.2	Kickoff Meeting	PT	2.6	1																				
3.2.1	Presentation of SRPMM	PT	3.1	1																				

Color Coding based on

Plan

Realized

PT: Project Team

TBD: To Be Determine

PI: Principal Investigator

Note: The Figure shows all the tasks needed **to** implement and try the methodology (Salas, 2021).

Cost Management and Procurement

The following expenditures have been calculated for this project

- Cost for educating trainers
- Cost for developing training Material
- Templates and conducting a project pilot with the software subscription

Specifics for calculating budget:

- Number of Trainers 1
- Number of trainees 22
- Cost for producing training material plus templates, workflow, and project management software Blastrace by Atlassian: $21 per person in a subscription based per month and group rate applies so total $ per month for the laboratory.

Cost for conducting Pilot Project has been projected within monthly subscription.

The project team needs to ensure that the Pilot Project can be completed within this budget constraint.

Approved budget must be communicated with the PI.

Funds can be requested from procurement University California San Diego for cash payout.

To clarify the expenditure, all the receipts are saved, and the hard copy is submitted to Gilbert Laboratory.

Procurement

General Project Management Training will be outsourced to a certified trainer. Based on procurement regulations, a minimum of 3 consultants have been identified and arepresented in Chart E5.

The budget is attached to the project and can serve as document to track project expenditure.

Chart E5 Identified Trainers for General Project Management Training

Source	**Price (**USD**)**	**Contact**	**Comment**
Blastrace Inc consulting	$270 per group/monthly	management@blastrace.com	$21 per person/month Group rate applies for 22 people and is $270 per month includes • Training • Workflow • Templates • Software management
Project Management Boot Camp	$795	ProjectManagement@ucsd.edu	Synchronous web-based class meetings that are scheduled to meet online at published times (time/date).
Project Management Essentials BUSA-40064	$639	ProjectManagement@ucsd.edu.	This course will provide 27 educational hours. To receive Professional Development Units (PDU's), submit your UCSD transcript to the Project Management Institute (PMI).

Note: The chart describes the differences between methodology and courses based on the value that the courses provide (Salas, 2021).

Chart E6 SRPMM Implementation Cost Sheet

SRPMM Implementation

WBS	Activity	Unit Cost (USD)	Quantity	Cost (USD)
1	**Establish Project Team**			
1.1	Assign Project Manager			
1.2	Assign Team Members			
1.3	General Project Management Training - Group rate	$270/month	1	
2	**Pilot Project**			
2.1	Identify and Initiate Pilot Project			
2.2	Plan Pilot Project's PMP			
2.3	Execute Pilot Project			
2.4	Evaluate Pilot Project			
2.5	Deliver Pilot Project			
2.6	Evaluate and adapt SRPMM			
3	**Gradual Implementation of SRPMM**			
3.1	Develop Training Material		1	
3.2	Kickoff Meeting			
3.2.1	Presentation of SRPMM			
3.3	Training of Personnel Virtual and added with the software subscription per user	$12.27 / per user in group rate	22	
4	**Closure**			
4.1	Lessons Learned			
4.2	Document SRPMM			
	Total Cost			$270/month

Note: The chart presents the cost of the implementation of SRPMM based on subscription method (Salas, 2021).

Quality Management

The quality of the training and implementation must be reviewed by the PI.

Risk Management

There is a risk that policy changes resulting in change of management might delay the project, as new managers will have to be informed of the project. To mitigate this risk, the project is budgeted with 3 extra people in mind.

Resources Management

Chart represents the Human Resources that have been identified by the project and can be confirmed once a project start date has been determined. Resources that will be borrowed or requested from lab manager are presented in Chart .

Chart E7 SRPMM Implementation HRM

Name	Activity	Date needed	Confirmation
Lab Manager	Training of personnel		**pending**
Graduate student	Training of personnel		**pending**
To be determined	**Project Manager**		**To be determined**

Note: Chart shows the roles of each stakeholder to implement the methodology (Salas, 2021).

Chart E8

SRPMM Implementation Resource Requirements

Resource	**Date needed**	***Note***
Laptop		*Available at Gilbert Lab*
Zoom		*Available at Gilbert Lab*

Note: The resourced that are needed during the project implementation (Salas, 2021).

Communications Management

Internal communication with Gilbert Laboratory through emails as frequently as the project manager needs it. Communications with external sources will be done using electronic emails. All communication must be attached to the project and sent to archiving upon project completion.

Chart E9 SRPMM Implementation Communication Planning

Information	Stakeholder	Sender	Frequency
Project Team Meeting	Team members	PM	**Weekly**
Project progress	PI, PS, LM	PM	**On demand**
Logistics request	LM	PM	**On demand**
Presentation	Team members	PM	**One time point**
Procurement Communication	LM	PM Team	**Weekly**
Training dates	**Team members**	**Team**	**On demand**

Note: Chart shows the preferable communication method throughout the project (Salas, 2021).

Stakeholder identification and approach

Chart E10 lists the identified stakeholders of the SRPMM implementation plan. Using the Stakeholder's list, Figure E1 provides information on Stakeholder analysis and engagement.

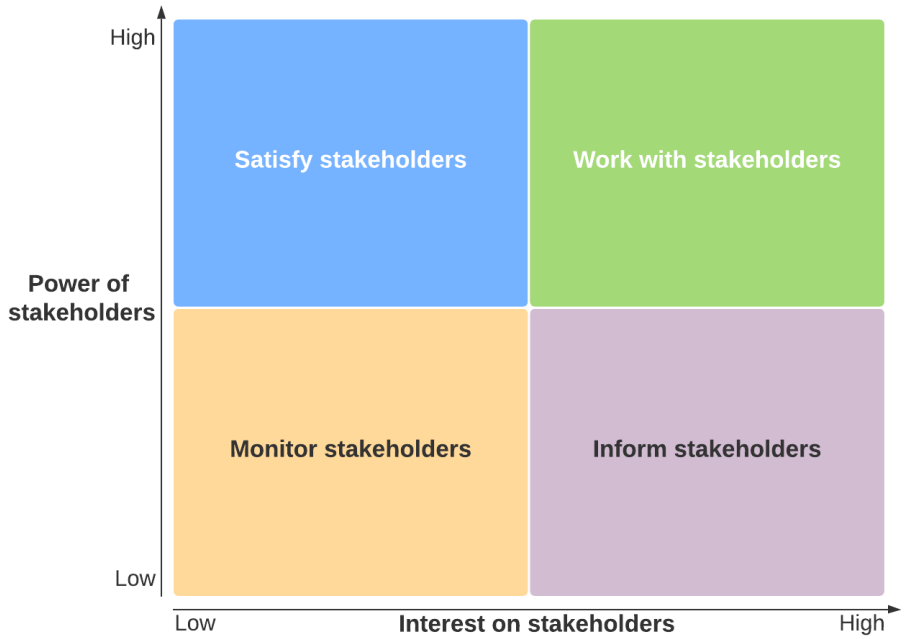
Stakeholder Register

Chart E10 SRPMM implementation Stakeholder Register

#	**StakeholderName**	**Stakeholder Position**	**Contact Information**	**Requirements**	**Expectations**	**Power Level**	***InterestLevel***
1	PI	Sponsor	Confidential only upon request		Timely completion ofprojects Organizational change	H	*H*
2	Project Scientist	Funding authority	Confidential only upon request		Proper documentation of expenditure	H	*L*
3	Lab Manager	Provide Logistics	Confidential only upon request	Approval of PI	Timely request	L	*H*
4	Administrator	Finance Administration	Confidential only upon request	Approval of LM	Timely request of funds Clearly outlined budget	L	*L*
5	Graduate Students	Sponsor	Confidential only upon request		Gain Knowledge	H	*H*
6	Post-doctoral	Team Member	Confidential only upon request	Approval of PI	Gain Knowledge	L	*H*
7	Training Seller	External Stakeholder	Confidential only upon request	Clearly defined expectations	Timely payment of fees	L	*H*

Note: The list of collaborators that would use the methodology (Salas, 2021).

Figure E3 SRPMM Implementation Power/Interest Grid



Keep Satisfied

Regular communication and feedback of project progress.

Manage Closely:

Describe how to actively engage stakeholders during the project.

Keep informed:

Timely request for project resources

Timely release of monetary funds

Monitor:

Ensure receipts are transferred to this stake

Appendix F: *Scientific Research Project Management Sample Project*

Rothia Project

- Rothia Initiation
  - Rothia Roles and Responsibilities Matrix
    - Rothia Collaboration Communication Plan
  - Rothia Statement of Work -Grant proposal summary (SOW)
  - Rothia Project Charter (Statement)
- Rothia Planning
  - Rothia Project Management Plan
- Rothia Execution
  - Rothia Update Status
  - Rothia Meeting notes
  - Rothia Checklist
  - Rothia Issues log
- Rothia Closing
  - Rothia Closure Report
  - Rothia Lesson learned
  - Rothia Document and Records Management Procedure

Rothia Initiation

During this phase describes:

- Authorization of new project
- Selection resource limits
- Recognizing the benefits of the project
- Describe initial requirements, assumptions, risks, constraints, stakeholders, and existing agreements
  - Select project manager
  - Assess project feasibility
  - Create deliverable objectives
- Grant proposal & approval
- Prepare Project charter
- Stakeholder & communication plan

Initiation Templates

- Rothia Roles and Responsibilities Matrix
  - Rothia Collaboration Communication Plan
- Rothia Statement of Work -Grant proposal summary (SOW)
- Rothia Project Charter (Statement)

Research Initiation Documents

- Information
  - GRANT
  - Objectives
  - Timeline
  - Receiving samples from collaborators
- Agreements MTA, IRB
- Financial Quote Invoice

Rothia Roles and Responsibilities Matrix

Guidances Roles and Responsibilities Matrix Template

This template is used to determine the various roles and responsibilities within the project and consists of

- Table with names and contact details of project team members
- A responsibility assignment matrix, also known as RACI chart describes the participation by various roles in completing tasks or deliverables for a project
  - **R-** Responsible: Coordinates work and ensures it is completed.
  - **A-** Accountable: Accountable for the deliverables including sign-off and confirmation that deliverable is approved.
  - **C-** Consulted: Consulted about the requirements.
  - **I-** Informed: Informed or notified of the project progress.

Fill out the next table providing information on the project team members.

Name	Title	contact (email, phone number...)
Sarah Allard	project manager	ucsd email
Jack Gilbert	co-PI 2021 UCSD	ucsd email

Rob Knight	co-PI 2021 UCSD	ucsd email
Jason Rosch	co-PI/St. Jude	ucsd email
Rommie Amaro	co-PI/UCSD	ucsd email
Anna Edlund	co-PI/UCSD	ucsd email
Ben Kroker	co-PI/UCSD	ucsd email
David Pride	providing strains/UCSD, 2021	ucsd email
Mariana Salas	gilbert lab manager /wet lab coordinator	ucsd email
Neil Gottel	grad student/wet lab team	ucsd email
Sonya Donato	staff assoc/wet lab team	ucsd email
Elizabeth Brown	staff assoc/wet lab team	ucsd email
Joshua Tran	gilbert lab assistan/wet lab team	ucsd email

Using the provided description below fill out the RACI table below

Step	Project Deliverables	Principal Investigator and Co -PI	Project Manager	Wet lab coordinator	Wet lab team
1	Visualize different growth of clinical (isolated from COVID-19 patient samples) Rothia strains on BHI and Blood Agar, especially mucoid presentation	C / I	RACI	R / C	R
2	Transfer strains and materials to Ben Kroker' s lab, who will test binding/replication with SARS-CoV-2	I	RACI	R / C	R
3	Submit grant with great preliminary data!	RACI	RACI	I	I

Rothia Collaboration Communication Plan

Guidances Stakeholder Management and Communication Plan

Instructions

- Stakeholders are any individual that has low to high influence in your research project and it's key to identify them since the beginning to create a clear communication plan throughout the process.
  - Describe how stakeholders are identified
  - Describe how the stakeholder expectations are analyzed
  - Describe how the stakeholder can impact the project
  - Describe how to manage stakeholders

Our stakeholders or collaborators

#	Stakeholder Name	Stakeholder role	Contact information (email, phone number)	Requirements	Expectations	Power Level	Interest Level
	Sarah Allard	project manager	ucsd email	Submit Grant and gather the data	grant deadline submission / get reliable data from experiments	H	H
	Jack Gilbert	co-PI 2021 UCSD	ucsd email	Submit Grant and gather the data	grant deadline submission	H	H

	Rob Knight	co-PI 2021 UCSD	ucsd email	Submit Grant and gather the data	grant deadline submission	H	M
	Jason Rosch	co-PI/St. Jude	ucsd email	Submit Grant and gather the data	grant deadline submission	M	M
	Rommie Amaro	co-PI/UCSD	ucsd email	Submit Grant and gather the data	grant deadline submission	M	M
	Anna Edlund	co-PI/UCSD	ucsd email	Submit Grant and gather the data	grant deadline submission	M	M
	Ben Kroker	co-PI/UCSD	ucsd email	Submit Grant and gather the data	grant deadline submission	M	M
	David Pride	providing strains /UCSD, 2021	ucsd email	Submit Grant and gather the data	grant deadline submission	H	M
	Mariana Salas	gilbert lab manager /wet lab coordinator	ucsd email	Generate data from wet lab / bioinformatics experiments	get reliable data from experiments	M	H
	Neil Gottel	grad student/wet lab team	ucsd email	Generate data from wet lab / bioinformatics experiment	get reliable data from experiments	L	L
	Sonya Donato	staff assoc/wet lab team	ucsd email	Generate data from wet lab / bioinformatics experiment	get reliable data from experiments	L	L
	Elizabeth Brown	staff assoc/wet lab team	ucsd email	Generate data from wet lab / bioinformatics experiment	get reliable data from experiments	L	L
	Joshua Tran	gilbert lab assistan /wet lab team	ucsd email	Generate data from wet lab / bioinformatics experiment	get reliable data from experiments	L	L

Power/Interest Grid

Power/Interest Grid

Keep Satisfied
Describe how to actively engage stakeholders during the project

Manage Closely:
Describe how to actively engage stakeholders during the project

Keep informed:
Describe how to actively engage stakeholders during the project

Monitor:
Describe how to actively engage stakeholders during the project

Research/Stakeholder	Communication method(s)
• co -pi • project manager • team power	• Emails for updates and coordination • zoom meeting for checkpoints or coordination • blastrace/onedrive to keep all documents created

Comms plan goals:

- Fill out the communication strategy table based on communication plan (see PMP template) and stakeholder management. Keep track of communication using the Communication Log Template

Our comms cadence

Cadence / Frequency	Collaborators / Owner	Method / Channel	Information	Links to additional info
Daily	Project Manager (Sarah Allard)	Email	Project questions, updates	
Weekly	Project Manager (Sarah Allard)	Email updates	Project updates	

Bi-Weekly	Wet lab coordinator(Mariana Salas) / wet lab team	Email	Experiments updates	sharing results
Monthly	Co-PI	Email	ask for project update and grant submission	
Quarterly				
Yearly				
Ad Hoc				

Open actions

Concepts from Comms table

The stakeholder that is communicated to Owner: who is responsible for the communication **Information:** What need to be communicated to the stakeholder
Communication method and technology: oral/written Via electronic media of via printed paper
Frequency: How often communication will take place

Rothia Statement of Work -Grant proposal summary (SOW)

Guidances for Statement of Work or add the grant proposal

The SOW provides a description of results to be delivered by the project.

Take the grant proposal and summarize below.

Publish Date: 19 Oct 2021

Project Name : Rothia grant proposal

Assigned project manager : Sarah Allard

Team members: Team list

Location of work: University of California, San Diego

Background: Why are we doing this project? A purpose statement attempts to answer this.

Generate data for grant proposal due at the end of October. This is to look at the interaction between Rothia strain and Sars-Covid.

Scope: Generate data for grant proposal due at the end of October

Activities planned & Duration Estimates:

Activities planned	Duration Estimates:
Transfer strains	1 week
Grow bacterias in BHI	1 week
Send for sequencing	1 week
Check interactions through microscope	1 week
Generate grant	1 month
Generate paper publication	1 month

Deliverables: This part lists and describes what is due and when.

Transfer strains mid Oct
Grow bacterias in BHI mid Oct
Send for sequencing mid Oct

Grant Name: None (yet)

Last updated: Aug 13, 2021

Project Manager: @ Sarah Allard

Locations: Hubbs Lab

PI: @ Jack Gilbert

General Status: Generating preliminary data for proposal
Current Collaborators: @ Rob Knight, co-PI 2021; Jason Rosch, co-PI/St. Jude, 2021; Rommie Amaro, co-PI/UCSD, 2021; Anna Edlund, co-PI/UCSD, 2021; Ben Kroker, co-PI/UCSD, 2021; David Pride, providing strains/UCSD, 2021

Past Collaborators: [name] [rol/position]

Team Power: [Decision: Who is doing what?]

- Get strains from Govind in David Pride's lab: Sarah, Mariana
- Grow strains on BHI and Blood Agar: Mariana @ jtt009
- Take side-by-side photos of plates: Sarah, Mariana
- Give plated strains to Ben Kroker's lab: Sarah, Mariana, Megan T
- Give sterilized surface material coupons (n=8 per material) to Ben Kroker's lab: Megan T, Sarah, Mariana
- Induce random mutagenesis and screen for reduced "snottiness": @ Neil Gottel
- GL Wet lab @ Mariana Salas Garcia @ Sonya Donato @ Elizabeth Brown
- Metagenomics Qiita ID 14027 @ Sonya Donato started and identified strains

Objectives:

1. Visualize different growth of clinical (isolated from COVID-19 patient samples) Rothia strains on BHI and Blood Agar, especially mucoid presentation
2. Transfer strains and materials to Ben Kroker's lab, who will test binding/replication with SARS-CoV-2
3. Submit grant with great preliminary data!

OneDrive Folder Organization

[Files Distribution are based on how the workflow of the project from Initiation to Closing phase. Examples of documents created in each phase]

Initiation

- Information
  - GRANT
  - Objectives
  - Timeline
  - Receiving samples from collaborators
- Agreements MTA, IRB
- Financial Quote Invoice

Execution

- eNotebook
  - Protocols
    - 16s rRNA sequencing
      - Plate Recording
    - Sequencing
- Sequencing Setup

Closing

Check interactions through microscope mid Oct
Generate grant END of OCT
Generate paper publication end of November

Cost Estimates: This is done with laboratory funds to generate data as low as possible.

Supplies	Cost Estimate	Cost actual Spent
Wet Lab supplies media: BHI, Blood Agar, Plates, loops	$1000	
Sanger Sequencing	$300	
Metagenomics	$420	
Others	$280	
Total	$2000	

UC San Diego

University of California, San Diego
Central Accounts Receivable Office
9500 Gilman Drive, MC 0602
La Jolla, CA 92093-0602

Bill -to
Gilbert Lab
Project number
Project Task
Funding Source Number

Reference Account: 88005
Ship To:UCSD Microbiome Core - BRFI
9500 Gilman Dr. La Jolla, CA 92093

INVOICE
OCT 2021-007

Purchase Order

Invoice Date 10/26/2021

Line Total $ 420.00

Total $ 420.00

Payment Terms IMMEDIATE **Due Date** immediate

Balance Due $ 420.00

1	5 Rothia cultures for metagenomics sequencing	$84.00	5	$ 420.00

Line Total $ 420.00

Make all checks payable to:
The Regents of the University of California
Please reference invoice number on all payments.
Tax ID #: 95-6006144

Mail to:
UCSD Campus Main Depository
P.O. Box 741539
Los Angeles, CA 90074-1539

Send remittance statements or inquiries to:
accountsreceivable@ucsd.edu
ACH Routing (ABA) #: 121000358
ACH preferred format: CTX
ACH Bank Address: PO Box 37025
San Francisco, CA 94137

Electronic Payment Information
Account Name: Regents of the University of California UCSD Depository
Receiving Bank Name: Bank of America, NA
Account #: 1233018188

Order Confirmation

Please print this page for your records

Retrogen, Inc.
Solutions for Functional Genomics

Online Order Estimated Invoice*

Order ID	Date
60426	2021-10-14

please use this orderID in all communications

Customer Information

Billing Address	Shipping Adress	ORDER BARCODE
Mariana Salas **Gilbert Lab** 8750 Biological Grade Hubbs Hall 2270 La Jolla, CA 92037 Phone: 8157938397	Mariana Salas 8750 Biological Grade Hubbs Hall 2270 La Jolla, CA 92037	*60426* Email: msalasgarcia@ucsd.edu RetrogenID: gilbertlab

Sample Pickup Information

Pickup service NOT requested

Payment Information: Payment By P O

P O Number: po

DNA Sequencing							Total: $0.00
Project Name	Priority	Type	Order Format	# of Samples	Custom Oligos	Project Total	
Hide: 2021-10-14	standard	premixed	tube	19	no	$0.00	

#	Well ID	Tube Label	DNA name	DNA Type	Template Length (bp)	Conc. (ng/uL)	Primers	Conc. (pmol/uL)	Special protocol	Price
1	A1	1	1-R1	PCR	400	N/A	7 *customer primer*	N/A	None Known	$0.00
2	B1	2	2-R1	PCR	400	N/A	7 *customer primer*	N/A	None Known	$0.00
3	C1	3	3-R2	PCR	400	N/A	7 *customer primer*	N/A	None Known	$0.00
4	D1	4	4-R2	PCR	400	N/A	7 *customer primer*	N/A	None Known	$0.00
5	E1	5	5-R4	PCR	400	N/A	7 *customer primer*	N/A	None Known	$0.00
6	F1	6	6-R4	PCR	400	N/A	7 *customer primer*	N/A	None Known	$0.00
7	G1	7	7-R5	PCR	400	N/A	7 *customer primer*	N/A	None Known	$0.00
8	H1	8	8-R5	PCR	400	N/A	7 *customer primer*	N/A	None Known	$0.00

5	E1	5	5-R4	PCR	400	N/A	7 customer primer	N/A	None Known	$0.00
6	F1	6	6-R4	PCR	400	N/A	7 customer primer	N/A	None Known	$0.00
7	G1	7	7-R5	PCR	400	N/A	7 customer primer	N/A	None Known	$0.00
8	H1	8	8-R5	PCR	400	N/A	7 customer primer	N/A	None Known	$0.00
9	A2	9	9-R6	PCR	400	N/A	7 customer primer	N/A	None Known	$0.00
10	B2	10	10-R6	PCR	400	N/A	7 customer primer	N/A	None Known	$0.00
11	C2	11	11-R8	PCR	400	N/A	7 customer primer	N/A	None Known	$0.00
12	D2	12	12-R8	PCR	400	N/A	7 customer primer	N/A	None Known	$0.00
13	E2	13	13-R16	PCR	400	N/A	7 customer primer	N/A	None Known	$0.00
14	F2	14	14-R16	PCR	400	N/A	7 customer primer	N/A	None Known	$0.00
15	G2	15	15-R24	PCR	400	N/A	7 customer primer	N/A	None Known	$0.00
16	H2	16	16-R24	PCR	400	N/A	7 customer primer	N/A	None Known	$0.00
17	A3	17	17-R42	PCR	400	N/A	7 customer primer	N/A	None Known	$0.00
18	B3	18	18-R42	PCR	400	N/A	7 customer primer	N/A	None Known	$0.00
19	C3	19	19-C1	PCR	400	N/A	7 customer primer	N/A	None Known	$0.00
									Total Cost for this Project:	$0.00

Comments / Notes:

black dot

ORDER SUB-TOTAL : **$0**

TAX : **$0**

SHIPPING : **$0.00**

FINAL TOTAL : $0

return to Retrogen.com

Rothia Project Charter (Statement)

A project charter should only include three elements: **your project objectives, scope, and responsibilities**. Once your charter has been approved, you should then create a project plan. Your project plan builds on your project charter to provide a more in-depth blueprint of the key elements of your project.

Planning

- Sample Tracking
- Storage Location ie/Type of sample/Freezer/shelf/rack/box number/total number of samples
- Labeling (Tubewriter)
- Mapping Sample
- Loading
- Consumables Login

- Sequencing Setup
  - Data Transfer
  - Final Report
  - Archived Project
  - Sequencing Tracking
  - Analysis
  - Papers

[Copy and paste projectName_template from Onedrive based on your project name alphabetically and link the Team Files just for the project]

Rothia Planning

Planning phase describes:

- Create project scope statement
- Estimate work requirements, quality and quantity of work and resources needed.
- Estimate time and develop schedule
- Evaluation of the various risks
- Gain formal approval

Planning Templates

- Rothia Project Management Plan

Research Planning Documents

- Sample Tracking
- Storage Location ie/Type of sample/Freezer/shelf/rack/box number/total number of samples
- Labeling (Tubewriter)
- Mapping Sample
- Loading
- Consumables Login

Rothia Project Management Plan

Instructions

Document Purpose

is a detailed document that describes how to accomplish the project objectives
This document describes how the project will be executed, monitored and controlled.
Document owner
This document is produced by the project manager
Instructions
To compose a Project Management using this template:
Complete this template using the local instructions
If not already done, delete all instructions

PMP log

Activity	Date	Comments	Researcher
PMP 2.0 is submitted to Principal investigator (PI) for approval	20 Oct 2021	PI approves the PMP 2.0	Project Manager Sarah Team Member Mariana

Project Name:

Objective 1

Objective 1	Strains metagenomics and sanger sequencing identification
Due date	13 Oct 2021
Key outcomes	We were able to isolate the strains to move forward to other analysis
Status	DONE

Objective 2

Objective 2	Grow strains with new media and make new analysis with
Due date	08 Nov 2021
Key outcomes	
Status	ON PROGRESS

Summary & Problem Statement

Integration Management

Driver / Project Manager	Approver	Contributors	Stakeholder
Sarah Alllard	Jack Gilbert	Mariana Salas	Other lab researchers

Scope Management
Describe the following:

1. Visualize different growth of clinical (isolated from COVID-19 patient samples) Rothia strains on BHI and Blood Agar, especially mucoid presentation
2. Transfer strains and materials to Ben Kroker's lab, who will test binding/replication with SARS-CoV-2
3. Submit grant with great preliminary data

Roadmap Planner:

[Visualize your project objectives in a roadmap, create checkpoints for reviewing progress, and create goals in a timeline matter]

Work Breakdown Structure

#	WBS name	Description
1	**Establish Project Team**	PI. - Jack work on a grant assign project
1.1	**Project Manager**	PM - Sarah
1.2	**Team Members**	Laboratories involved
2.1	**Initiate Pilot Project**	Coordination with teams
2.2	**Planning Project**	Create the PMP and protocols to do the experiments
2.3	**Implement Project**	Experimentation
2.4	**Evaluate Project**	Modify and new phase of experimentatioin
2.5	**Deliver Project**	Final results for writing grant
2.6	**Evaluate and adjust To write grant**	Analysis of results
3	**Closure** **write grant**	Write grant
3.1	**Publish paper**	Write paper and publish

Milestones and deadlines

Specific deliverables the project will generate. These are related to the specific objectives and can be a product, service or result.

Milestone	Owner	Deadline	Status
First phase of experimentation and results	Project Manager	15 Oct 2021	DONE

2nd phase of experimentation and results	Project Manager	12 Nov 2021	IN PROGRESS
Gather results and write grant and paper	Project Manager	01 Dec 2021	WAITING ON RESULTS

Reference materials

Sample Tracking

#	Kit ID	LF Sample	Freezer Bag	Freezer Location
All samples original stock	in box	rothia	rothia project	-80 C first shelf Hubbs Hall
Freezer stocks	in box	rothia	rothia project	-80 C first shelf Hubbs Hall

Budget Tracking

Describe the various costs associated with activities from the scope plan, including how the cost is determined.
Describe how planned funds will be requested

- Describe the procedure for requesting funds
- Describe procedure for procurement (if necessary)

Expenses			
Category	Planned Budget	Actual Amount Spent	Explanations
Sample kits			
Wet Lab supplies	$1000	$600	media purchase
Bioinformatics			
Sequencing	$1000	$800	Sanger & shotgun
Office Supplies			
Total	$2000	$1400	

Procurement

Overview of supplies and if you want request supplies please use the link

Assumptions:
Describes the resources that are assumed to be available.

- Rothia will grow in the media that we prepare
- All data will be generated based on the scope

Constraints:
Describe the constraints that might restrict or limit the project from progressing.

- Time to write the grant is
- Resources are limited because it's a preliminary study

Preliminary risk:
Describe any identified risk

- Time to get all the data generated on time to apply for the grant
- Working with multiple teams might delayed some results.

OneDrive Folder Organization

[Files Distribution are based on how the workflow of the project from Initiation to Closing phase. Examples of documents created in each phase]

Initiation

- Information
  - GRANT
  - Objectives
  - Timeline
  - Receiving samples from collaborators
- Agreements MTA, IRB
- Financial Quote Invoice

Planning

Execution

- eNotebook
  - Protocols
    - 16s rRNA sequencing
      - Plate Recording
    - Sequencing
- Sequencing Setup

Closing

- Sample Tracking
- Storage Location ie/Type of sample/Freezer/shelf/rack/box number/total number of samples
- Labeling (Tubewriter)
- Mapping Sample
- Loading
- Consumables Login

- Sequencing Setup
  - Data Transfer
  - Final Report
  - Archived Project
  - Sequencing Tracking
  - Analysis
  - Papers

[Copy and paste projectName_template from Onedrive based on your project name alphabetically and link the Team Files just for the project]

Rothia Execution

Execution phase describes:

- Acquire project team members
- Execute the work or experiments

Execution Templates

- Rothia Update Status
- Rothia Meeting notes
- Rothia Checklist
- Rothia Issues log

Research Execution Documents

- eNotebook
  - Protocols
    - 16s rRNA sequencing
      - Plate Recording
    - Sequencing
- Sequencing Setup

Rothia Update Status

Customize this template to meet the needs of your project.

To generate update status of the project execution to inform the team project and corresponding collaborators

Summary 25 Oct 2021

Current project health	Current project status	Project constraints
GREEN / YELLOW / RED	GREEN we are working on the 2nd phase of experiements	YELLOW we had some media contamination in the first batch

Status Breakdown

	Projects Key factors	GREEN - ON TRACK	YELLOW - SOME ISSUES	RED - OFF TRACK
Overall Status	Objectives	GREEN - ON TRACK		
	Scope	GREEN - ON TRACK		
	Schedule		YELLOW - SOME ISSUES We had to extent deliverables	
	Resources		YELLOW - SOME ISSUES This is preliminary study, so limited resources	
	Team Power	GREEN - ON TRACK		

	Procurement		**YELLOW - SOME ISSUES** Work experiments in tie budget	
	Other			

Project status

Accomplishments

1. We finished the first batch of sequencing sanger and shotgun
2. We created freeze stocks for future

Next steps

1. Start the coordination for the 2nd phase
2. Coordinate with stakeholders
3. Tues 11/2-Wed 11/3 - Receive prepared media and frozen glycerol stocks of Rothia mutants at Hubbs (we will have a tracking number)

   Wed/Thurs - prep media aliquots and incubate some as controls to check for contamination

   Thurs - Sarah and Mariana meet to get Sarah ready to do some solo lab stuff on Saturday

   Friday morning 11/5 - Mariana starts mutant strains (they take 72 hrs)

   Saturday morning 11/6
   - Sarah starts 4 Rothia and 3 other strains (staph, pseudo, bacillus)

   Monday 11/8 - Mariana starts Pseudovirus incubations with Juan and gives strains to Hiu

Risks & project issues

1. First phase the media got contamination from autoclave and delayed results

If APPLIES CHECKLIST FOR MICROBIOME SEQUENCING DATA COLLABORATION PROJECTS

[As of current staff members, please make sure to include relevant members to include in your emails]

- Wet-Lab Team: Mariana and student workers
- Microbiome Core: Sonya and Liz

Checklist Status Table

STEPS	TASK	DESCRIPTION	RESPONSIBLE PERSON	CHECKLIST	STATUS DONE WORKING ON
1	Sample Dispatch	Either swabs or tubes in a batch of 88 maximum samples per packet	Wet-Lab Team	Proof of picture confirming the condition of arrival and add it to project record	DONE
	Arrival Mode	Either all-at-once or roll-in-basis	Wet-Lab Team	Confirm the quantity and names of samples with the Collaborator	DONE
	Sequencing Type	16S/Shallow-shotgun /Deep-shotgun	Wet-Lab Team	Confirm with Jack and Collaborator	DONE
	Processing Location	Microbiome Core /Gilbert Lab	Wet-Lab Team	Confirm with Jack and Collaborator	DONE

2	Master List	Single spreadsheet with column names (sample name, well number, description) in every sheet for each plate in vertical format	Wet-Lab Team or Microbiome Core	Cross-check with random n samples in each sheet	DONE
	Pico Green	Single spreadsheet with map of 96-well plate, info entered with DNA conc. of each plate in every sheet in horizontal format	Wet-Lab Team or Microbiome Core	Check for outlier signal Cross-check with random n samples in each sheet Confirm with Collaborator	DONE
	Pooling	High biomass - concentration-based pooling Low biomass – equal volume-based pooling	Wet-Lab Team or Microbiome Core	Check for outlier signal Cross-check with random n samples in each sheet	DONE
	Sequencing Lanes	Concatenation of plate-specific pools into lanes. Note: Each run has max of 2 lanes	Wet-Lab Team or Microbiome Core	Check the naming and format of the form submission to IGM	DONE
	Sample-Prep Info	Creation of prep-info file (qiita format with minimal columns provided)	Wet-Lab Team or Microbiome Core	Cross-check with random n samples w.r.t original document once compiled	DONE
	Processing Duration	Approx. 100 samples ~ 3 weeks Note: time varies based on the queue	Wet-Lab Team or Microbiome Core	Email if 3 weeks passed with zero response	DONE
	Sequencing Duration	Approx. a month for batch submission of projects Note: time varies based on the queue	IGM	Email if 3-4 weeks passed with zero response	DONE
3	Data Analyst	Jack announces the new project, either a volunteer or relevant person gets assigned	Wet-Lab Team or Microbiome Core	Forwards the past email thread for history reference	DONE
	Blastrace	The profile of project management system is updated with the assigned person' s email	Wet-Lab Team	Update the contact person in the project's profile page in Blastrace	
4	Sequencing Data - Ready	The raw and converted data files are uploaded in Barnacle	Mariana and Jeff		DONE
	Qiita	A qiita ID is created with a copy of the sequencing data uploaded	Mariana	Add Mariana's email as Lab Manager Add Jack's email as PI	DONE
	Email Confirmation	Send email to Project Lead once the upload is complete	Mariana	CC Jack and Collaborators	DONE

	Metadata and Data Analysis	Collaboration through meetings or emails Note: Mandatory analysis of 16S and shallow-shotgun data through qiita	Project Lead and Jack	Personalized Work Style	DONE
	Quality Assurance	Approx. 1 month to determine if re-processing or re-sequencing required	Project Lead	Email Mariana and Jack	DONE
5	Sample Recycling	Ship samples back to Collaborators or Clear the samples from freezer if collaborators confirm discard	Project Lead	Seek approval from Collaborator and Jack followed by confirming Mariana	No Applicable
	Data Transfer through qiita	Share the qiita project ID with Collaborator	Project Lead	Email the Collaborator	No Applicable
	Data Transfer through Globus	Share the location of raw data files in Barnacle	Project Lead	Email Jeff and CC Mariana and Jack with path to the converted data in Barnacle	No Applicable

Rothia Meeting notes

Use this in every meeting in order to have record of decision making and next steps in the project.

Date 29 Oct 2021

Participants

List meeting participants using their @mention names:

- @ Sarah Allard PM
- @ Mariana Salas LM coordinate experiments in
- @mention a person to add them as an attendee and they will be notified.

Goals

List goals for this meeting (e.g., Set deliverables priorities for the next month):

- Set deliverables priorities for the next 2 weeks to start 08 Nov 2021

Discussion topics

Time	Topic	Presenter	Notes
10am	Go over the next steps	Sarah	
10:30am	Taking decision how to move forward	Sarah / Mariana	Sarah will send an email with future actions

Action items

Add action items to close the loop on open questions or discussion topics:

- Following up from our call today, here's the pan for upcoming Rothia experiments

  Tues 11/2-Wed 11/3 - Receive prepared media and frozen glycerol stocks of Rothia mutants at Hubbs (we will have a tracking number)

  Wed/Thurs - prep media aliquots and incubate some as controls to check for contamination

  Thurs - Sarah and Mariana meet to get Sarah ready to do some solo lab stuff on Saturday

  Friday morning 11/5 - Mariana starts mutant strains (they take 72 hrs)

Saturday morning 11/6 - Sarah starts 4 Rothia and 3 other strains (staph, pseudo, bacillus)

Monday 11/8 - Mariana starts Pseudovirus incubations with Juan and gives strains to Hiu

I just sent emails to the group to check on timing - hopefully everyone is good to go for Nov 8.

Decisions

Type /decision to record the decisions you make in this meeting:

Above all the agreements.

Rothia Checklist

Use it to work with your team in order to follow up with responsibilities while doing a experiment, link protocols to follow

Priorities for the week

To do list

- [ ] Tues 11/2-Wed 11/3 - Receive prepared media and frozen glycerol stocks of Rothia mutants at Hubbs (we will have a tracking number)
- [ ] Wed/Thurs - prep media aliquots and incubate some as controls to check for contamination
- [ ] Thurs - Sarah and Mariana meet to get Sarah ready to do some solo lab stuff on Saturday
- [ ] Friday morning 11/5 - Mariana starts mutant strains (they take 72 hrs)
- [ ] Saturday morning 11/6 - Sarah starts 4 Rothia and 3 other strains (staph, pseudo, bacillus)
- [ ] Monday 11/8 - Mariana starts Pseudovirus incubations with Juan and gives strains to Hiu
- [ ] I just sent emails to the group to check on timing - hopefully everyone is good to go for Nov 8.

Low Priorities

To do list

- [ ]
- [ ]

Upcoming tasks

Wet Lab / Dry Lab

- [ ]

Completed

- [ ]
- [ ]

Rothia Issues log

Issues Title	Date Create, Owner, Notes	Resolution
1. Media got contaminated from autoclave 15 Sep 2021 2. Sanger low quality and pcr	1. Mariana worked on it 2. Mariana worked on it	1. Made a control to find out where the contaminations was coming from and adjust accordingly 2. Change in protocols to improve quality

Rothia Closing

During this phase describes:

- Compile of the documents
- Contractual closure of the contract
- Financial closure of the charge numbers
- Administrative closure of the paperwork

Closing Templates

- Rothia Closure Report
- Rothia Lesson learned
- Rothia Document and Records Management Procedure

Research Closing Documents

- Sequencing Setup
  - Data Transfer
  - Final Report
  - Archived Project
  - Sequencing Tracking
  - Analysis
  - Papers

Rothia Closure Report

Project Name	Rothia
Project Manager	Sarah Allard
Reason for Project Closure	IN PROGRESS

Project Performance

	Planned	Actual
Start Date	18 Aug 2021	
Finish Date	15 Nov 2021	
Budget	$2000	

Project Summary:

IN PROGRESS

Presentation:

Embedded powerpoint or google slides

IN PROGRESS

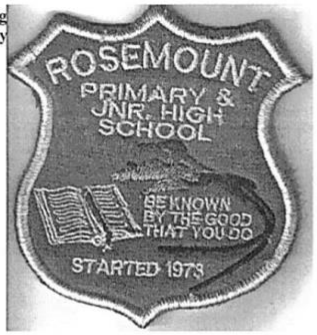
Note: The sample project encompasses all templates that can be used from beginning to end for a research project allowing a better organization of the project management workflow (Salas, 2021).

Appendix G: Manual of Scientific Research Project Management Methodology for Gilbert Laboratory

The manual unifies the templates from the methodology and how to use them in a project. The manual is in a pdf document, use this link to get direct access and download Manual of Scientific Research Project Management Methodology for Gilbert Laboratory.

Appendix H: Philological dictum

Chairman: Rev. Courtney Golding
Principal: Malaika Sinclair-Bailey
M.A, BA, DipEd



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December 1, 2022

TO WHOM IT MAY CONCERN

Dear Sirs:

RE: Thorough Review and Proofreading of Final Graduation Project submitted by Mariana Cristiana Salas Garcia in partial fulfilment of the requirements for the Masters in Project Management (MPM) Degree

I hereby certify that Mariana Cristiana Salas Garcia has made all corrections to the Final Graduation Project document as I have advised. Based on my assessment, the document now meets the literary and linguistic standards expected of a student for a degree at the Masters level.

Yours truly,

M. Sinclair-Bailey
Malaika Sinclair-Bailey (Mrs.)
Principal

Rosemount Primary & Infant School
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