UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL
(UCI)

REVOLUTIONIZING OIL AND GAS MAINTENANCE: A PROJECT MANAGEMENT PLAN FOR UNLEASHING SMART BUSINESS INTELLIGENCE (BI) FOR ENHANCED WORK PRIORITIZATION AND RISK-TRACKING

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FINAL GRADUATION PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE
MASTER'S IN PROJECT MANAGEMENT (MPM) DEGREE

Georgetown, Guyana

June, 2024

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's in Project Management (MPM) Degree

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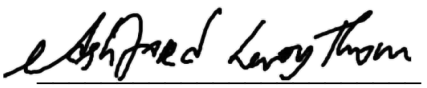

Ashford Leroy Thom
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DEDICATION

To my unwavering support system,

Your belief in me fueled my journey. From late-night study sessions to celebrating victories, you've been there. To my parents, who sacrificed for my success: Thank you for teaching me resilience and determination. To friends, my second family: Our laughter-filled nights and shared dreams will forever be cherished. To professors and mentors: Your passion for knowledge inspired me to reach higher. And to fellow graduates: Let's step into the future with courage and camaraderie.

ACKNOWLEDGMENTS

I would like to take this opportunity to express my heartfelt gratitude to all those who have supported and guided me throughout my final graduation project.

Firstly, I would like to express my sincere appreciation to my academic advisor, Róger Valverde, for his guidance, encouragement, and support throughout the project. His insightful feedback and constructive criticism have been invaluable in shaping my research and the outcome of the project.

Furthermore, I would like to acknowledge the contributions of my family and friends, who have been a constant source of love, encouragement, and motivation throughout my academic journey. Their unwavering support and belief in me have been a source of strength and inspiration.

I would like to express my gratitude to the participants of my final graduation project, who have generously shared their time and experiences with me. Their contributions have been instrumental in shaping the research and the outcome of the project.

Thank you all once again for your invaluable support and guidance.

ABSTRACT

Caribbean Oil and Gas Ltd. (COGL) has significant oil and gas exploration and production expertise, particularly in supplying Floating, Production, Storage, and Offloading (FPSO) units and comprehensive subsea solutions. Despite its strengths, COGL faces challenges in prioritizing maintenance activities and tracking risks for its FPSO units due to the need for a cohesive Business Intelligence (BI) tool. To address this challenge, COGL aims to develop an integrated BI tool tailored to end users' needs, combining data and leveraging advanced analytics to optimize maintenance activities and resource allocation. This Final Graduation Project looked to develop a Project Management Plan to guide the development and implementation of the BI tool. The plan was successfully developed using best practices drawn from the project management community. The project plan’s goals included analyzing existing tools, defining project scope, planning for the development of the BI Tool, and its integration and deployment in operations to address the gaps in risk management and work prioritization. The research approach integrated qualitative and quantitative methodologies to inform the development of the BI tool, using insights from interviews, focus groups, historical maintenance records, and secondary sources. The deliverables produced from this project will supply a tailored BI solution for managing maintenance planning in the Oil and Gas sector, contributing valuable knowledge to the field.

Keywords: Business Intelligence tool, FPSO units, oil and gas exploration, maintenance planning, risk management, Project Management Plan

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ABBREVIATIONS AND ACRONYMS

AMOS	Automated Maintenance and Operations System
BI	Business Intelligence
CA	Control Account
CAPA	Corrective and Preventive Action
CCB	Change Control Board
CEO	Chief Executive Officer
CFO	Chief Financial Officer
COGL	Caribbean Oil and Gas Limited
COO	Chief Operating Officer
CPI	Cost Performance Index
CTO	Chief Technology Officer
CV	Cost Variance
FGP	Final Graduation Project
FPSO	Floating, Production, Storage and Offloading
GDMS	Global Data Management System
GDPR	Global Data Protection Rights
GEMS	Global Enterprise Management System
GPM	Green Project Management
GPS	Global Positioning System
ID	Identification
IT	Information Technology

KPI	Key Performance Indicator
MPM	Master's in Project Management
MS	Microsoft
PMI	Project Management Institute
PMO	Programme Management Office
PMP	Project Management Professional
RACI	Responsibility, Accountability, Consulted, and Informed
RBS	Risk Breakdown Structure
RFP	Request for Proposal
SAP	Systems, Applications, and Products
SPI	Schedule Performance Index
SV	Schedule Variance
SWOT	Strengths, Weaknesses, Opportunities, and Threats
UI	User Interface
USD	United States Dollar
WBS	Work Breakdown Structure

EXECUTIVE SUMMARY

Caribbean Oil and Gas Ltd. (COGL) is a prominent player in the offshore energy sector, offering various solutions vital to the industry's success. Specializing in oil and gas exploration and production, COGL excels in supplying floating production, storage, and offloading (FPSO) units, which are essential for processing and transporting hydrocarbons extracted offshore. Alongside FPSO units, COGL offers comprehensive subsea solutions and environmental consulting services, emphasizing compliance and best practices. With a focus on innovation and sustainability, COGL is committed to shaping a resilient energy future while upholding the highest ethical and operational standards.

However, COGL faces challenges in prioritizing maintenance activities and tracking risks for its Floating Production, Storage, and Offloading (FPSO) units. Current Business Intelligence (BI) tools need a unified approach, hindering efficient decision-making. To address this, COGL aims to develop an integrated BI tool tailored to end users' needs in work-prioritization and risk-tracking. This tool will combine data, supplying a unified platform for analysis and visualization. Leveraging advanced analytics and predictive modeling will enable COGL to optimize maintenance activities and distribute resources effectively. By empowering stakeholders with actionable insights, COGL looks to enhance operational efficiency and ensure the continued success of its offshore energy operations.

A structured Project Management Plan is necessary for the organization to avoid misalignment, resource mismanagement, and unclear goals, which can potentially result in delays and budget overruns. A comprehensive plan is crucial to defining project scope, goals, timelines, resource allocation, and risk management strategies, ensuring smooth progression and successful outcomes. To address this, the project team plans to meticulously elicit and document detailed requirements from stakeholders, focusing on work prioritization and risk tracking in Oil and Gas Maintenance.

The general aim of the project was to develop a well-structured Project Management Plan that will guide the successful development and implementation of a Smart Business Intelligence (BI) tool that will be used to enhance work prioritization and risk-tracking in Oil and Gas Maintenance. The specific objectives were: to analyze three tools that are currently used by Oil and Gas companies for maintenance planning (work prioritization and risk-tracking) to understand what features are needed for the new integrated BI tool; to clearly define the scope of the Smart BI tool project, outlining its boundaries, functionalities, and limitations by eliciting and documenting detailed requirements from stakeholders, with a specific focus on work prioritization and risk-tracking needs in Oil and Gas Maintenance; to develop a project schedule that outlines all project activities, dependencies, and milestones; to estimate project costs effectively, plan resource allocations and cost control for the project lifecycle; to develop a robust quality management plan to ensure standards are met and stakeholder expectations are prioritized; to estimate project resources and how they can be acquired and managed; to develop a communication plan that provides timely and relevant information exchanges; to identify, assess, and plan mitigation of project risks to minimize potential negative impacts; to develop a procurement plan that outlines the procurement processes; to identify and analyze project stakeholders to effectively manage their expectations; and, to develop a well-

structured Project Management Plan for the development and implementation of the BI tool using the tools analysis and well-defined scope document by integrating Specific Objectives 3 to 10.

The chosen mixed-method research approach for the Final Graduation Project (FGP) integrates qualitative and quantitative methodologies to comprehensively address the complexities of maintenance planning within the Oil and Gas sector. Through interviews, focus groups, and workshops with key stakeholders, including maintenance personnel, managers, and IT specialists, qualitative insights were gathered to inform the development of an integrated BI tool. Internal data such as historical maintenance records supplemented these qualitative findings, supplying valuable context and grounding the project in real-world challenges. Additionally, secondary sources, including industry reports, publications, and academic journals, augmented the research, offering insights into industry trends, BI tool usage, and theoretical frameworks pertinent to the project's goals.

The deliverables produced from this research supply a robust framework for managing the development and implementation of the Vessel Eye BI tool. Each document, from the Tools Analysis to the Project Stakeholder Management Plan, is meticulously crafted to address specific project needs, such as defining scope, managing resources, and mitigating risks. By synthesizing insights from both primary and secondary sources, the project is poised to deliver a tailored solution that addresses the unique maintenance planning requirements of the Oil and Gas sector while also contributing valuable knowledge to the broader field through disseminating research findings in academic and industry forums.

The development and implementation of the Vessel Eye BI Tool at COGL will be guided by the structured Project Management Plan developed and aimed at enhancing work prioritization and risk-tracking capabilities across its FPSO fleet. A comprehensive Current State Assessment revealed that existing tools—AMOS by SpecTec, OsiSoft PI Vision, and Power Automate—did not fully meet the project's scope requirements but can serve as data sources. The project's scope was meticulously crafted through extensive stakeholder engagement, ensuring alignment with industry-specific standards and infrastructure compatibility. With an estimated cost of $7,000 and a 4-month timeframe, the BI Tool will provide advanced analytics and visualization, empowering decision-making and risk management. Key project management components, including scheduling, cost estimation, quality assurance, risk management, and stakeholder engagement, were rigorously planned to ensure project success. Moving forward, recommendations include developing data governance, performance measurement, sustainability, knowledge management, integration, and make-or-buy analysis plans to optimize the BI Tool's functionality and long-term value.

1 INTRODUCTION

Caribbean Oil and Gas Ltd. (COGL) stands as a pioneering force in the offshore energy sector, renowned for its ability in the exploration and production of oil and gas resources. COGL strives to elevate operational efficiency and maximize asset value by embracing a culture of innovation and sustainability. However, amidst its leadership in offshore energy solutions, COGL faces a pressing challenge in effectively prioritizing maintenance activities and tracking associated risks for its Floating Production, Storage, and Offloading (FPSO) units. While valuable, existing Business Intelligence (BI) tools need a cohesive approach to delivering critical insights necessary for informed decision-making in these crucial areas. Recognizing this gap, COGL has embarked on a strategic initiative to develop and implement an integrated BI tool tailored to end users' specific needs involved in work-prioritization and risk-tracking processes within the organization.

The current scenario at COGL is characterized by using multiple tools that fall short of providing a streamlined approach to essential information crucial for work prioritization and risk-tracking in FPSO maintenance. These fragmented tools hinder efficient data gathering and analysis, resulting in siloed information and suboptimal decision-making processes. Consequently, the absence of a unified BI solution tailored to COGL's maintenance operations poses significant challenges in resource allocation, identification of critical maintenance tasks, and mitigation of associated risks. This fragmented approach jeopardizes operational efficiency, potentially leading to increased downtime and compromised safety and environmental standards. Addressing this challenge is imperative

for COGL to uphold the reliability, performance, and profitability of its offshore energy assets amidst evolving industry dynamics and regulatory requirements.

Thus, the purpose of this endeavor is twofold: to develop a well-structured Project Management Plan that will guide the successful development and implementation of a smart Business Intelligence (BI) tool and to enhance work prioritization and risk-tracking in Oil and Gas Maintenance. By meticulously analyzing existing tools, defining the project scope, establishing a project schedule, estimating costs, implementing quality management measures, managing resources, facilitating communication, mitigating risks, procuring necessary resources, and managing stakeholders effectively, COGL aims to ensure the seamless integration of an integrated BI tool that optimizes maintenance activities and propels operational efficiency to new heights.

1.1 Background

Caribbean Oil and Gas Ltd. (COGL) operates at the forefront of the offshore energy sector, specializing in exploring and producing oil and gas resources. With a commitment to innovation and sustainability, COGL continually seeks to enhance operational efficiency and maximize the value of its assets. However, despite its leadership in offshore energy solutions, COGL needs help prioritizing maintenance activities and tracking associated risks for its Floating Production, Storage, and Offloading (FPSO) units. Though valuable, existing Business Intelligence (BI) tools need a unified approach to supplying the necessary insights for informed decision-making in these critical areas. To address this gap, COGL has embarked on a strategic initiative to develop and implement an integrated BI tool tailored to end users' specific needs in the organization's work-prioritization and risk-tracking processes.

The current landscape at COGL is characterized by the use of multiple BI tools that do not deliver a streamlined approach to information crucial for work prioritization and risk-tracking concerning FPSO maintenance. These disparate tools hinder efficient data gathering and analysis, resulting in siloed information and suboptimal decision-making processes. The absence of a unified BI solution tailored to the unique requirements of COGL's maintenance operations poses significant challenges in effectively distributing resources, identifying critical maintenance tasks, and mitigating associated risks. This fragmented approach compromises the organization's ability to optimize maintenance activities and ensure the continued reliability and performance of its FPSO units.

To address these challenges, COGL proposes developing and implementing an integrated BI tool specifically designed to meet the needs of end users involved in work-prioritization and risk-tracking processes for FPSO maintenance. This solution combines data from disparate sources, supplying a unified platform for accessing, analyzing, and visualizing information critical to informed decision-making. The integrated BI tool will enable COGL to gain actionable insights into maintenance priorities, identify potential risks, and optimize resource allocation strategies by leveraging advanced analytics, real-time monitoring capabilities, and predictive modeling techniques. This integrated approach to BI will empower stakeholders across the organization with the information they need to proactively manage maintenance activities, enhance operational efficiency, and ensure the continued success of COGL's offshore energy operations.

1.2 Statement of the Problem

Caribbean Oil and Gas Ltd. (COGL) faces a critical challenge in prioritizing maintenance activities and tracking associated risks for its Floating Production, Storage, and Offloading (FPSO) units. Despite its leadership in offshore energy solutions, the current landscape at COGL is characterized by the use of multiple Business Intelligence (BI) tools that fail to deliver a streamlined approach to essential information crucial for work-prioritization and risk-tracking in FPSO maintenance. These disparate tools hinder efficient data gathering and analysis, resulting in fragmented information silos and suboptimal decision-making processes. The absence of a unified BI solution tailored to the specific needs of COGL's maintenance operations poses significant obstacles in effectively allocating resources, identifying critical maintenance tasks, and mitigating associated risks.

This fragmented approach compromises the organization's ability to optimize maintenance activities, leading to potential operational disruptions, increased downtime, and compromised safety and environmental standards. Addressing this challenge is paramount for COGL to ensure its offshore energy assets' continued reliability, performance, and profitability amidst evolving industry dynamics and regulatory requirements.

1.3 Purpose

The absence of a structured Project Management Plan currently leaves the organization without clear guidance for executing the project, encompassing both development and implementation phases. This deficiency poses risks of misalignment, resource mismanagement, and unclear objectives, potentially leading to delays and budget overruns. A comprehensive plan is imperative to supply a roadmap defining project scope, objectives, timelines, resource allocation, and risk management strategies, ensuring smooth progression and successful outcomes. To address this, the project team aims to meticulously elicit and document detailed requirements from stakeholders, particularly emphasizing work prioritization and risk-tracking in Oil and Gas Maintenance. This scoping process is vital for delineating the proposed BI tool's boundaries, functionalities, and limitations, ensuring seamless alignment with operations-specific needs, and facilitating enhanced decision-making. The organization's reliance on disparate tools for maintenance management has led to inefficiencies, increased costs, and elevated risks. By combining these tools into a unified BI solution tailored to its needs, significant improvements are expected, including a projected 60% reduction in maintenance costs and a 30% increase in overall operational efficiency.

1.4 General Objective

To develop a well-structured Project Management Plan that will guide the successful development and implementation of a Smart Business Intelligence (BI) tool that will be used to enhance work prioritization and risk-tracking in Oil and Gas Maintenance.

1.5 Specific Objectives

1. To analyze three tools currently used by Oil and Gas companies for maintenance planning (work prioritization and risk-tracking) to understand what features are needed for the new integrated BI tool.
2. To clearly define the scope of the Smart BI tool project, outlining its boundaries, functionalities, and limitations by eliciting and documenting detailed requirements from stakeholders, with a specific focus on work prioritization and risk-tracking needs in Oil and Gas Maintenance.
3. Develop a project schedule that outlines all project activities, dependencies, and milestones.
4. Estimate project costs effectively and plan resource allocations and cost control for the project lifecycle.
5. Develop a robust quality management plan to ensure standards are met and stakeholder expectations are prioritized.
6. Estimate project resources and how they can be acquired and managed.
7. Develop a communication plan that ensures prompt and relevant information exchanges.

8. Identify, assess, and plan mitigation of project risks to minimize potential negative impacts.
9. Develop a procurement plan that outlines the procurement processes.
10. Identify and analyze project stakeholders to effectively manage their expectations.
11. To develop a well-structured Project Management Plan for the development and implementation of the BI tool using the tools analysis and well-defined scope document by integrating Specific Objectives 3 to 10.

2 THEORETICAL FRAMEWORK

Theoretical frameworks refer to the structured set of concepts and ideas that form the foundation for constructing arguments and analyzing phenomena. These frameworks integrate and interrelate various perspectives, offering a comprehensive lens through which the outcome of a defined event can be extrapolated. By synthesizing diverse viewpoints and theoretical models, a theoretical framework provides a coherent structure that guides the exploration of complex issues, allowing researchers to systematically approach their subject matter (Rocco & Plakhotnik, 2009).

It serves as a blueprint for understanding relationships, identifying patterns, and predicting outcomes, thereby enhancing the rigor and depth of academic and practical inquiries. Through this integration of multiple perspectives, theoretical frameworks enable a nuanced analysis that captures the multifaceted nature of real-world events and processes. The theoretical framework of this FGP seeks to relate the Company/Enterprise Framework, Project Management Concepts, and other applicable theories/concepts related to the subject matter (Rocco & Plakhotnik, 2009).

2.1 Company/Enterprise Framework

2.1.1 Company/Enterprise Background

Caribbean Oil and Gas Ltd. (COGL), founded in 1972, emerged with a strategic vision to position itself as a prominent player in the offshore energy sector. Recognizing the untapped potential of the Caribbean region for oil and gas exploration and production, the company's start was driven by a commitment to meet the surging global demand for energy

while prioritizing environmental sustainability. COGL's founders aimed to create a reliable source of oil and gas through responsible practices, ensuring the long-term viability of energy production in the region.

Specializing in offshore exploration and production, COGL operates within regional and international markets, catering to petrochemicals, power generation, and maritime transportation industries. The company employs innovative technology and rigorous safety measures to extract resources from beneath the ocean floor, maintaining the highest standards in environmental stewardship. Additionally, COGL is a leader in designing, constructing, and operating Floating Production, Storage, and Offloading (FPSO) units, which are crucial for efficiently processing, storing, and transporting hydrocarbons extracted offshore.

Comprehensive subsea solutions, including pipelines, control systems, and maintenance services, form a significant aspect of COGL's product offerings. Beyond its core business activities, the company is committed to environmental and safety consulting, ensuring compliance with regulations and implementing best practices.

2.1.2 Mission and Vision Statements

As COGL envisions its future, it focuses on expanding its footprint in the offshore energy sector, using innovation to enhance exploration and production capabilities. The company strives to contribute to the global energy landscape, emphasizing reliability, sustainability, and responsible corporate citizenship. With a forward-looking perspective, Caribbean Oil and Gas Ltd. is dedicated to fostering economic development in the

Caribbean region and beyond, contributing to a resilient and sustainable energy future while keeping a commitment to the highest ethical and operational standards.

Mission Statement:

Oil and Gas Ltd. is dedicated to responsibly harnessing the untapped energy resources in the Caribbean, supplying sustainable and high-quality solutions to meet the global demand for oil and gas. We commit to pioneering environmentally conscious practices in offshore exploration and production, ensuring the long-term viability of energy production while contributing to the region's economic development (COGL, n.d.).

Vision Statement:

Caribbean Oil and Gas Ltd. envisions itself as a leading global player in the offshore energy sector, serving regional and international markets with reliable and efficient solutions. We strive to be at the forefront of innovation and technology, continuously expanding our capabilities to enhance exploration and production. Our vision encompasses a commitment to environmental stewardship, compliance with the highest safety standards, and a dedication to corporate responsibility, shaping a resilient and sustainable energy future for the world (COGL, n.d.).

The integrated Business Intelligence (BI) tool is intricately linked to the organization’s mission and vision by serving as a critical enabler for innovation, sustainability, and responsible corporate practices. By using advanced data analytics and visualization tools, the BI tool can enhance production operations by offering insights crucial for the decision-making process. Its primary focus on work prioritization and risk-

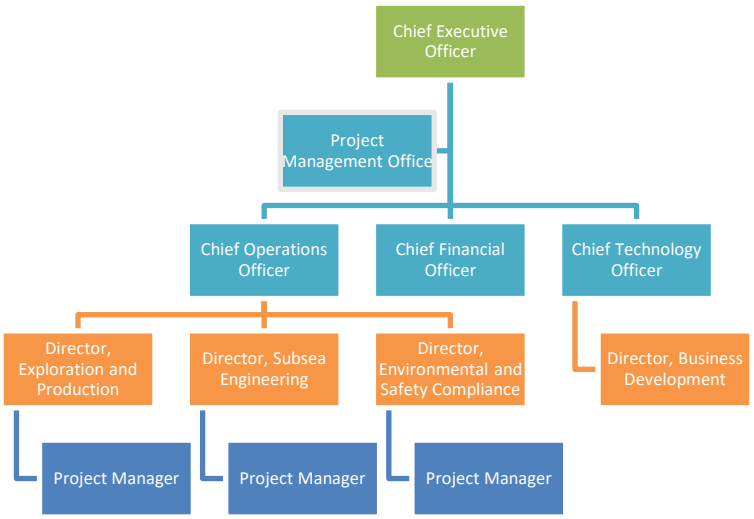
tracking in maintenance activities highlights the commitment to safety standards and responsible practices.

2.1.3 Organizational Structure

Caribbean Oil and Gas Ltd. (COGL) operates within a dynamic and streamlined organizational structure designed to effectively manage its diverse operations within the offshore energy sector. At the helm, the organization is led by a Chief Executive Officer (CEO), providing strategic direction, and overseeing the overall operations. Reporting directly to the CEO are critical executive roles, including a Chief Operations Officer (COO) responsible for the day-to-day management of offshore exploration and production activities, a Chief Financial Officer (CFO) overseeing financial strategies, and a Chief Technology Officer (CTO) leading technological advancements in offshore energy solutions as illustrated in Figure 1.

Figure 1

Organizational Structure of COGL



Note. COGL is led by a CEO who is joined by several other chiefs on the Management Board. There are several project managers within varying departments based on their discipline.

The organization is further organized into functional departments: Exploration and Production, Subsea Engineering, Environmental and Safety Compliance, and Business Development. Each department is headed by a Director or Vice President, who oversees the driving of departmental strategies that are aligned with the company's overall vision. A dedicated Project Management Office (PMO) ensures seamless coordination across various projects and initiatives. The organizational structure emphasizes collaboration and communication, fostering a dynamic and responsive environment to meet the evolving demands of the offshore energy industry.

2.1.4 Products Offered

Caribbean Oil and Gas Ltd. (COGL) stands at the forefront of supplying comprehensive solutions within the offshore energy sector. Specializing in the exploration and production of oil and gas, COGL offers a diverse array of products and services crucial to the industry's vitality. Central to its product offerings are Floating Production, Storage, and Offloading (FPSO) units, where COGL is a leader in design, construction, and operation. These FPSO units serve as integral components in efficiently processing, storing, and transporting hydrocarbons extracted offshore. Beyond this core competency, COGL supplies comprehensive subsea solutions encompassing pipelines, control systems, and maintenance services. In addition to its prowess in offshore energy, the company is dedicated to environmental and safety consulting, ensuring compliance with regulations, and championing best practices. As COGL envisions its future, the focus remains on innovation and sustainability, contributing to a resilient and sustainable energy future while keeping a commitment to the highest ethical and operational standards.

2.2 Project Management Concepts

Project Management serves as a comprehensive framework that encompasses a myriad of principles, processes, and techniques vital for the success of projects. According to the Project Management Institute (PMI) definition, a project is described as “a temporary endeavor undertaken to create a unique product, service, or result” (PMI, 2021, p. 4). These temporary endeavors unfold through various stages, from initiation to closing. Within each

stage, essential domains play a pivotal role in shaping the project's overall value delivery system and balancing its triple constraints.

2.2.1 Project Management Principles

Successful project execution depends on guiding philosophies that makeup project management principles. These principles include a commitment to ensuring projects align with organizational strategy and goals, emphasizing the importance of stakeholder engagement and effective communication throughout the project lifecycle. Moreover, they stress the need for comprehensive planning, risk management, and adaptability to change, recognizing that projects are dynamic instead of static. These philosophies, combined with good governance, ethics, and professionalism, collectively promote a framework that fosters transparency, adaptability, and the delivery of high-quality outcomes.

According to the PMI (2021), there are a total of 12 Project Management Principles that can be applied to any organization or project. These are:

1. **Be a diligent, respectful, and caring steward** – This is operationalized by showing a far-reaching commitment to the projects' financial, social, and environmental impacts.
2. **Create a collaborative project environment**—Teams need diverse individuals with skills, knowledge, and experience who will work collaboratively to execute the project objectives.
3. **Effectively engage with stakeholders** – Initiative-taking engagements ensure project success and customer satisfaction.

4. **Focus on value** – Continuous evaluation and adjustments will ensure that business goals, intended benefits, and value are realized.
5. **Recognize, evaluate, and respond to system interactions**—Projects are dynamic, so emphasis should be placed on monitoring and controlling such circumstances.
6. **Demonstrate leadership behaviors** – Effective leadership involves demonstrating and adapting behaviors to support individual and team needs.
7. **Tailor based on context** – Each project is unique; thus, its success is dependent on adapting to the unique context.
8. **Build quality into processes and deliverables**—Deliverables should meet project goals and align with the needs, uses, and acceptance criteria set by stakeholders.
9. **Navigate complexity** – Continuous monitoring and controlling will enable the project team to navigate the project life cycle.
10. **Optimize risk responses** – Risks can present themselves as opportunities or threats. Thus, they should be addressed throughout the project.
11. **Embrace adaptability and resiliency** – this helps the project accommodate change, recover from setbacks, and advance project work.
12. **Enable change to achieve the envisioned future state**—a structured approach to change helps the project team and organization transition from their current to future state.

Beginning with a focus on aligning the project with organizational strategy, these principles will help guide the BI project to address specific business needs and goals related to work prioritization and risk-tracking. Emphasizing stakeholder engagement and effective communication ensures that the BI solution aligns with user requirements and expectations. The adaptability principle recognizes the dynamic nature of the BI tool, allowing for flexibility in response to evolving business needs or technological advancements. By integrating these principles, the BI project can succeed by delivering a solution that meets technical requirements and adds substantial value to the organization by supplying actionable insights and strategic decision support.

2.2.2 Project Management Domains

Project management forms interconnected domains that collectively define and guide a project's stages. According to PMI (2021), there are eight domains, summarized in Figure 2.

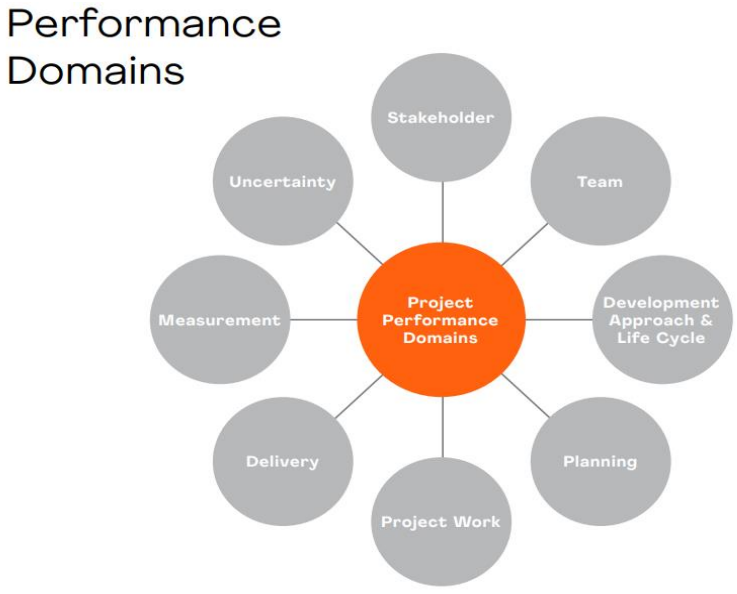
In brief, each of the project performance domains has a specific purpose. According to PMI (2021):

1. **Stakeholders** – addresses activities and functions associated with stakeholders.
2. **Team** – encompasses activities and functions associated with the people working on project deliverables.
3. **Development Approach and Life Cycle** – encompasses the project's development approach, cadence, and life cycle phases.

4. **Planning** – associated with organization at various levels of maturity and coordination necessary to deliver deliverables and outcomes.
5. **Project Work** – Establishing project processes, managing physical resources, and fostering a learning environment.
6. **Delivery** – delivery of the scope and quality that the project stakeholders need.
7. **Measurement** – assessment of project performance and taking proper action to maintain good performance.
8. **Uncertainty** - addresses activities and functions associated with risk and uncertainty.

Figure 2

Summary of Project Performance Domains



Note. Copied from: Project Management - 8 Performance Domains by V. Tiwari, 2023, accessed at https://medium.com/@vivektiwari2212/project-management-8-performance-domains-ace203e8d1c0. In the public domain.

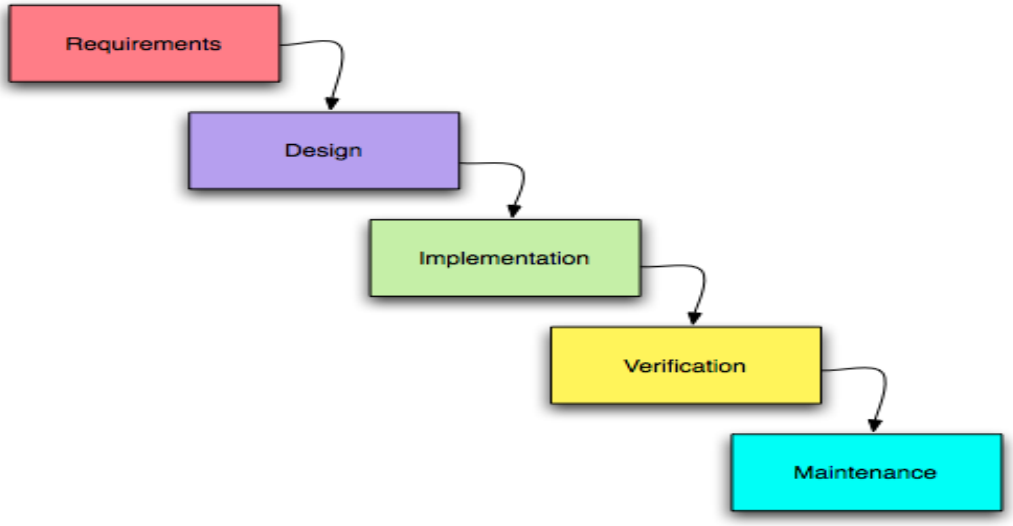
2.2.3 Predictive, Adaptative, and Hybrid Projects

Project Management Institute (PMI) recognizes and accommodates diverse project environments through three distinct development approaches: predictive, adaptive, and hybrid. These approaches are methodologies tailored to address the unique characteristics, uncertainties, and complexities that projects may encounter. Choosing a suitable development approach is pivotal in deciding how a project is planned, executed, and controlled, and it significantly influences the project's overall success (PMI, 2021, p. 35).

Predictive Approach: The predictive approach, also known as the traditional or waterfall approach, is characterized by its emphasis on detailed planning at the project's outset. Under this model, the entire project scope and requirements are defined upfront, and a comprehensive project plan is developed and adhered to throughout the project lifecycle. This approach is well-suited for projects with stable and well-understood requirements, where changes are expected to be minimal (PMI, 2021, p. 35). Figure 3 illustrates the sequence of activities summarizing the predictive approach.

Figure 3

Illustration of the Sequence of Activities Using Waterfall Development Approach

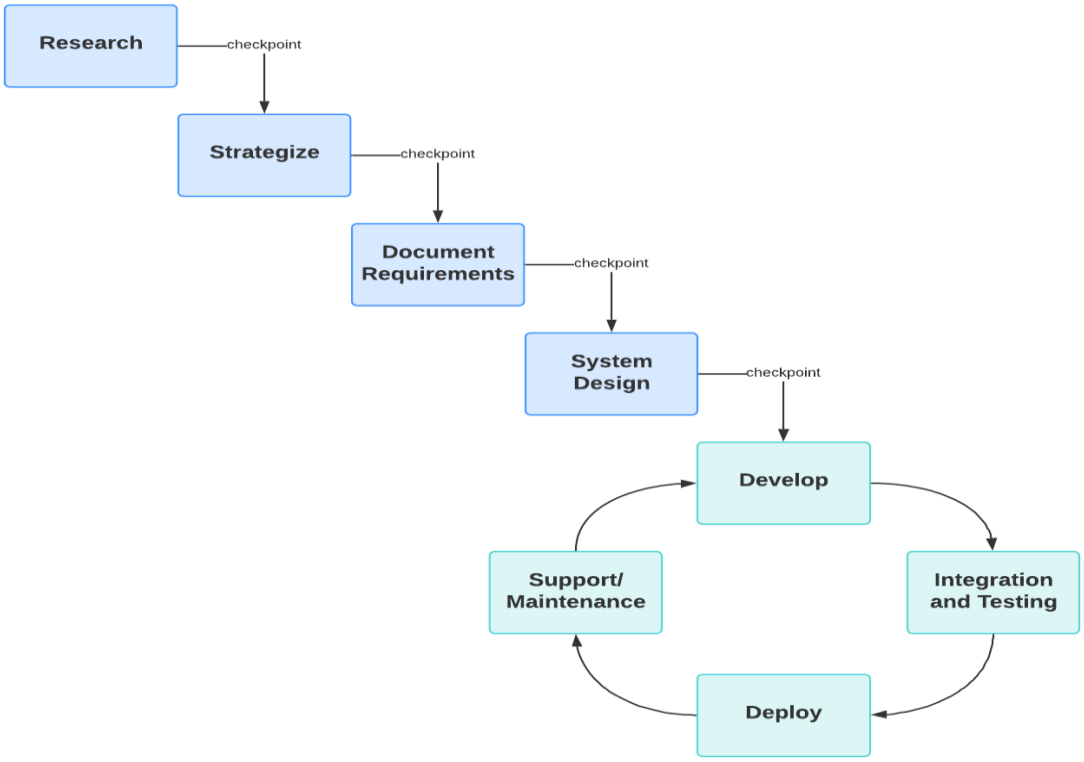


Note. Copied from: Comparing Traditional Systems Analysis and Design with Agile Methodologies by D. Hughey, 2009, accessed at https://www.umsl.edu/~hugheyd/is6840/waterfall.html. In the public domain.

Hybrid Approach: Recognizing that project conditions often fall between the extremes of predictability and adaptability, the hybrid approach looks to integrate elements of both predictive and adaptive methodologies. This approach allows project managers to tailor their strategies based on the project's specific needs. For instance, a project might use a predictive approach for specific, well-defined components while employing adaptive practices for areas with evolving requirements as is illustrated in Figure 4 (PMI, 2021, pp. 36-37).

Figure 4

Illustration of the Sequence of Activities Using Hybrid Development Approach



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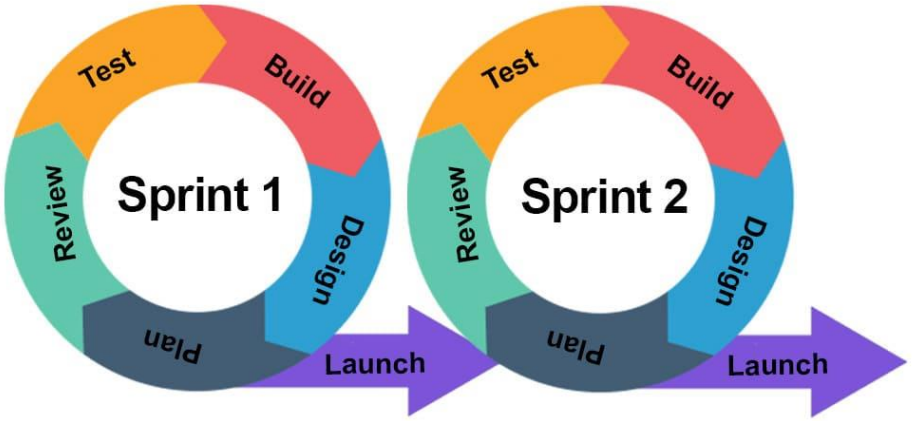
Adaptive Approach: In contrast, the adaptive, or agile, approach is designed to accommodate changing project conditions and requirements. Agile methodologies prioritize flexibility and collaboration, advocating incremental and iterative development cycles. Teams collaborate closely with stakeholders to regularly reassess and adjust project priorities, delivering incremental value throughout the project's duration. This approach is particularly effective in dynamic environments where requirements are expected to evolve, enabling teams to respond rapidly to changing needs (PMI, 2021, p. 38).

Figure 5

Illustration of the Sequence of Activities Using Agile Development Approach



Note. Copied from Agile-Waterfall Hybrid: Is It Right for Your Team? By Lucid Chart Team, n.d., accessed at https://www.lucidchart.com/blog/is-agile-waterfall-hybrid-right-for-your-team. In the public domain.

Adopting a hybrid approach for the Business Intelligence (BI) project is justified by the project's dynamic nature, diverse stakeholder requirements, and the evolving landscape of data analytics. A hybrid model allows for the integration of both predictive and adaptive methodologies, offering the structured planning and risk management characteristic of predictive approaches while also accommodating the need for flexibility and responsiveness inherent in adaptive methodologies. The predictive elements are associated with first assessing the current tools being used in the organization and what gaps exist. The next phase focuses on defining the future state sought and the definition of the business case. Based on this, the business case will outline what gaps need to be filled by the new BI tool, and development and implementation stages can begin, which will use an adaptive approach.

2.2.4 Project Management

A project, characterized as "a temporary endeavor undertaken to create a unique product, service, or result" (PMI, 2021, p. 4), undergoes distinct stages from initiation to closing. Project Management, as defined by the Project Management Institute (PMI), constitutes a comprehensive framework integrating diverse principles, processes, and techniques crucial for the success of projects (PMI, 2021). Similarly, Kerzner (2017) and Rowe (2020) define project management as “the application of knowledge, skills, and tools necessary to achieve the project’s requirements. The knowledge, skills, and tools are usually grouped into activities or processes”. With these definitions in mind, the management of projects can be elaborated on as an application of a methodological framework to ensure that the goals of projects are met.

Within each stage, fundamental domains and knowledge areas, encompassing Integration Management, Scope Management, Time Management, Cost Management, Quality Management, Resource Management, Communications Management, Risk Management, Procurement Management, and Stakeholder Management, play pivotal roles in shaping the overall value delivery system (PMI, 2021).

In conjunction with the five Process Groups – Initiating, Planning, Executing, Monitoring and Controlling, and Closing – these knowledge areas form a cohesive structure that guides project managers throughout the project lifecycle. They balance the project's triple constraints – scope, time, and cost – and facilitate effective decision-making, collaboration, and successful delivery of project objectives (PMI, 2021).

2.2.5 Project Management Knowledge Areas and Processes

The Project Management Institute (PMI) identifies ten knowledge areas and five process groups as critical components of the project management framework. The knowledge areas are:

1. **Integration Management**: Involves coordinating various aspects of a project, ensuring that all components work together seamlessly.
2. **Scope Management**: Encompasses defining, managing, and controlling the project scope to ensure it aligns with the project goals.
3. **Time Management**: Focuses on creating and managing project schedules, including activities, durations, and dependencies.
4. **Cost Management**: Involves estimating, budgeting, and controlling project costs to ensure the project stays within financial constraints.
5. **Quality Management**: Encompasses planning, assurance, and control of project quality to meet the defined standards.
6. **Resource Management**: Deals with organizing, managing, and leading project teams, including staffing, training, and team development.
7. **Communications Management**: Focuses on planning, managing, and optimizing project communications to ensure adequate information flow.
8. **Risk Management**: Involves identifying, assessing, and mitigating risks to project goals, ensuring proactive risk management.

9. **Procurement Management**: Encompasses planning, sourcing, and managing vendors and contracts to acquire goods and services for the project.
10. **Stakeholder Management**: Involves identifying, engaging, and managing stakeholders throughout the project lifecycle.

In conjunction with the five Process Groups – Initiating, Planning, Executing, Monitoring and Controlling, and Closing – these knowledge areas form a cohesive structure that guides project managers throughout the project lifecycle. They ensure the balancing of the project's triple constraints – scope, time, and cost – and facilitate effective decision-making, collaboration, and successful delivery of project goals (PMI, 2021).

2.2.6 Project Life Cycle

A project life cycle is defined as “the sequence of phases through which a project progresses. It includes initiation, planning, execution, and closure” (Project Business Academy [PBA], 2020) and (PMI, 2021). Similarly, Kerzner (2017) defines the project lifecycle as “‘go’ or ‘no go’ milestones at the end of each life-cycle phase. These milestones are used to decide if the project should be continued, and if so, should there be any changes to the funding or requirements?”. Collectively, it can be concluded that a project lifecycle is a sequence of phases with milestones marking go or no-go decisions. It guides project progression, ensuring alignment with objectives and facilitating effective decision-making regarding funding and requirements.

PMI acknowledges different project lifecycles, with the prominent Predictive (Waterfall) and Adaptive (Agile) lifecycles. The Predictive lifecycle involves a linear progression through phases such as initiation, planning, executing, monitoring and controlling, and closing, with each phase building upon the previous one (PMI, 2021). On the other hand, the Adaptive lifecycle, commonly known as Agile, is iterative and flexible. It organizes projects into smaller, iterative cycles, allowing continuous refinement and adaptation. Agile emphasizes collaboration, customer feedback, and the ability to respond to changing requirements, making it effective for projects where the final product may need to be clearly defined at the project's outset (PMI, 2021).

PMI also endorses the hybrid approach, which combines elements of both predictive and adaptive lifecycles. This allows project managers to tailor their strategies based on the project's specific needs. For instance, a hybrid model might use a predictive approach for specific, well-defined components while employing adaptive practices for areas with evolving requirements (PMI, 2021).

Adopting a hybrid approach for the Business Intelligence (BI) project is justified by the project's dynamic nature, diverse stakeholder requirements, and the evolving landscape of data analytics. A hybrid model allows for the integration of both predictive and adaptive methodologies, offering the structured planning and risk management characteristic of predictive approaches while also accommodating the need for flexibility and responsiveness inherent in adaptive methodologies.

2.2.7 Company Strategy, Portfolios, Programs, and Projects

Company strategy is the overarching plan defining an organization's long-term goals and objectives. It involves determining the direction a company intends to take and its initiatives to achieve competitive advantage, growth, and sustainability. A well-defined strategy guides the organization's decision-making, resource allocation, and effort allocation.

Portfolio Management:

Portfolio management involves the centralized and coordinated management of a collection of projects, programs, and other activities that align with the company's strategic goals. It aims to optimize the allocation of resources, balance risk, and ensure that the portfolio contributes to achieving the organization's strategic goals. Portfolio management provides a holistic view of all initiatives, allowing organizations to prioritize and align projects with strategic goals (Kerzner, 2018).

Program Management:

Program management involves coordinating and managing multiple related projects that collectively contribute to achieving a strategic business goal. It provides a structured framework for managing interdependencies between projects, sharing resources, and ensuring that the collective outcome of the projects aligns with the company's goals. Program management is crucial for overseeing complex initiatives that require a coordinated approach to achieve maximum synergies and efficiencies (Kerzner, 2018).

Project Management:

Project management is the discipline of planning, executing, and controlling projects to achieve specific goals within defined constraints, such as time, cost, and scope. It involves breaking down the work into manageable tasks, assigning responsibilities, and monitoring progress to ensure the project is delivered successfully. Effective project management ensures that individual projects contribute to the overall success of the company's strategic initiatives (PMI, 2021).

In the context of a Business Intelligence (BI) project, a well-defined company strategy supplies the guiding framework, articulating the long-term objectives and vision that the BI initiative aims to support. Portfolio management ensures that the BI project aligns with broader organizational goals and optimally distributes resources to data-related initiatives. Program management becomes essential when coordinating multiple interrelated BI projects, ensuring their collective outcomes contribute synergistically to strategic goals. At the project level, effective project management ensures that specific BI initiatives are planned, executed, and controlled precisely, ensuring valuable insights and analytics are delivered aligned with the overarching strategy.

2.3 Other Applicable Theories/Concepts Related to the Project Topic and Context

2.3.1 Current Situation of the Problem or Opportunity in Study

In the existing landscape at Caribbean Oil and Gas Ltd. (COGL), the deployment of three separate management tools has given rise to operational gaps that the forthcoming integrated BI tool aims to address. These current management tools, though individually valuable, need to deliver a streamlined approach to information crucial for work

prioritization and risk-tracking in the maintenance of Floating Production, Storage, and Offloading (FPSO) units. Imagine these tools as individual instruments in an orchestra, each playing its part but lacking the harmony needed to create a seamless symphony. The absence of a unified system hampers the efficient gathering and analysis of data related to FPSO unit maintenance, creating silos that hinder the comprehensive understanding needed for effective work prioritization and risk assessment.

The envisioned integrated BI tool serves as the conductor, combining the scattered notes into a cohesive melody. It is expected to bridge the existing gaps by combining data from disparate sources, supplying a unified and intuitive platform. Picture this as a conductor orchestrating various sections of an ensemble, ensuring every instrument plays in harmony. This integration is particularly crucial in the context of maintenance, where prompt and accurate information is paramount. For instance, the tool can amalgamate data on equipment status, historical performance, and potential risks, facilitating a holistic view essential for prioritizing maintenance tasks. The integrated BI tool is akin to a GPS, guiding COGL through the intricate network of data to navigate maintenance challenges effectively and enhance the overall performance of FPSO units.

2.3.2 Previous Research Done for the Topic in Study

The prior research landscape within the realm of Business Intelligence (BI) tools in the context of Caribbean Oil and Gas Ltd. (COGL) reveals a notable gap in the literature, as no previous studies have specifically concentrated on the development and implementation of an integrated BI tool tailored to meet the specific needs of end users involved in work-

prioritization and risk-tracking processes within the organization. Existing research in the broader field of BI often delves into the importance of integrated systems for enhanced decision-making and operational efficiency but tends to lack a laser focus on the intricacies of work-prioritization and risk-tracking processes, especially within the specialized domain of maintaining Floating Production, Storage, and Offloading (FPSO) units.

While a wealth of literature explores the general benefits of BI tools and integrated systems, the current gap underscores the unique nature of COGL's operational challenges. The absence of specific studies addressing the nuanced requirements of work prioritization and risk-tracking for FPSO maintenance suggests that the organization needs to navigate uncharted territory. As COGL looks to pioneer the development and implementation of an integrated BI tool, this gap highlights the novelty and significance of the research endeavor. The lack of prior research in this domain underscores the need for a targeted investigation into developing and deploying a BI solution that aligns with the intricacies of COGL's work processes, emphasizing the potential for groundbreaking contributions to academic and industry knowledge.

2.3.3 Other Theory Related to the Topic in Study

2.3.3.1 Business Intelligence Tool. A business intelligence (BI) tool is a software application or suite of tools designed to analyze, process, and present data in a visually comprehensible format to help businesses make informed decisions (Ramakrishnan et al., 2020). These tools gather data from various sources, such as databases, spreadsheets, and cloud services, and then process and transform them into meaningful insights, reports,

dashboards, and visualizations (Ramakrishnan et al., 2020). BI tools often include data querying and reporting features, to name a few. They enable users to explore data, identify trends, patterns, and anomalies, and derive actionable insights to drive business strategy, improve operations, and gain competitive advantages (Trieu, 2017). Examples of popular BI tools include Tableau, Microsoft Power BI, QlikView, and SAP BusinessObjects.

3 METHODOLOGICAL FRAMEWORK

Dew (2007) defines a methodology as "principles underlying particular research approaches, as distinct from 'methods,' which are ways of collecting data." Similarly, the methodology determines a method for researchers to produce data for analysis (Hesse-Biber & Leavy, 2010). Using this ideation, a methodological framework encompasses a structured approach that is used to conduct research. These frameworks uphold validity and reliability by guiding rigorous procedures and enhancing trust in findings. Transparent documentation of steps fosters clarity and understanding. Frameworks serve as guiding tools for researchers, navigating complexities and promoting excellence in scholarly pursuits across disciplines.

A mixed-method research approach was selected for this FGP. This approach will combine components from qualitative and quantitative research methods to provide a comprehensive understanding of the problem domain and to gather diverse perspectives from stakeholders to ensure that specific goals are achieved.

3.1 Information Sources

Information sources generally refer to any means by which individuals or organizations obtain data, knowledge, or insights to fulfill their information needs. These sources can vary widely depending on the context and purpose of the information search. Information sources may be classified as primary, secondary, or tertiary.

Primary sources provide firsthand information or original data that others have yet to interpret or synthesize.

Secondary sources consist of information collected, analyzed, and interpreted by others. These sources often provide summaries, analyses, or interpretations of primary sources.

Tertiary sources compile and organize information from primary and secondary sources to provide overviews or summaries on specific topics.

3.1.1 Primary Sources

Primary information sources encompass the sources that provide data for the first time (Ajayi, 2017). They are factual, original, and sought after to find a solution to a problem at hand (Ajayi, 2017).

The FGP focused on developing an integrated tool for maintenance planning within the Oil and Gas sector; as such, internal and external avenues were explored as primary information sources. Key stakeholders within Oil and Gas companies, including maintenance personnel, managers, decision-makers, and IT specialists, served as primary sources of qualitative insights. Through interviews, focus groups, and workshops, these stakeholders provided invaluable perspectives on current maintenance practices, challenges, and specific requirements for the BI tool. Internal data such as historical maintenance records, work orders, risk assessments, and performance metrics also offered quantitative insights.

3.1.2 Secondary Sources

Secondary information sources describe data that is already collected or produced by others. These sources provide existing knowledge and insights that can be used to

inform and support research objectives without directly collecting new data. Secondary information sources include published literature, reports, articles, databases, government publications, industry standards, and academic research.

The secondary information sources used in this FGP included industry reports, publications, and academic journals. Industry reports and publications provided valuable insights into maintenance planning trends, BI tool usage, and industry-specific challenges within the Oil and Gas sector. Academic journals contributed theoretical frameworks, case studies, and empirical findings related to BI tools, maintenance planning, risk management, and technology adoption in similar industries. The secondary information sources used in this FGP included industry reports, publications, and academic journals. Industry reports and publications provided valuable insights into maintenance planning trends, BI tool usage, and industry-specific challenges within the Oil and Gas sector. Academic journals contributed theoretical frameworks, case studies, and empirical findings related to BI tools, maintenance planning, risk management, and technology adoption in similar industries.

Table 1

Information Sources Used

Objectives	Information Sources	
	Primary	Secondary
1. To analyze three tools currently used by Oil and Gas companies for maintenance planning (work prioritization and risk-tracking).	• Interviews with maintenance personnel and managers	• Industry reports • Academic journal • Publications on BI tools and maintenance practices in the Oil and Gas sector
2. To clearly define the scope of the Smart BI tool project, outlining its boundaries, functionalities, and limitations.	• Stakeholder meetings • Focus groups • Requirements **gathering** sessions	• Industry reports • Academic journals • Publications on BI tools and maintenance planning methodologies

Objectives	Information Sources	
	Primary	Secondary
3. To develop a well-structured Project Management Plan for the development and implementation of the BI tool.	• Internal documentation • Expert consultations	• Project management literature • Best practices guides • Case studies on BI tool implementations
4. Develop a project schedule that outlines all project activities, dependencies, and milestones.	• Work breakdown structure • Gantt Chart • Project Management Software	• Project management literature • Online resources • Schedule Templates
5. Estimate project costs effectively, plan resource allocations and cost control for the project lifecycle	• Financial reports • Budget spreadsheets • Resource allocation plans	• Cost estimation techniques and templates • Financial management literature
6. Develop a robust quality management plan to ensure standards are met, and stakeholder expectations are prioritized.	• Quality assurance technical standards • Stakeholder feedback channels • BI governance process	• Quality management literature
7. Estimate project resources and how they can be acquired and managed.	• Resource Inventory • Skills assessment	• Resource management literature • Procurement and supply chain literature
8. Develop a communication plan that ensures timely and relevant information exchanges.	• Communications governance process • Meeting agendas • Stakeholder engagements	• Communications and stakeholder engagement literature
9. Identify, assess, and plan mitigation of project risks to minimize potential negative impacts.	• Risk registers • Risk assessment workshops	• Risk management literature • Industry risk analysis reports
10. Develop a procurement plan that outlines the procurement processes.	• Procurement policies	• Procurement management procedure • Procurement management literature
11. Identify and analyze project stakeholders to effectively manage their expectations.	• Stakeholder interviews • stakeholder analysis workshops	• stakeholder management literature • stakeholder engagement surveys

Note. The table above summarizes the different information sources that will be used to achieve the objectives covered by the FGP.

3.2 Research Methods

Dew (2007) defines a methodology as "principles underlying particular research approaches, as distinct from 'methods,' which are ways of collecting data." Similarly, the methodology determines a method for researchers to produce data for analysis (Hesse-Biber & Leavy, 2010). Research methods describe the systematic approaches and techniques researchers employ to investigate, analyze, and interpret data to address research questions, test hypotheses, or solve problems. These methods encompass a wide range of strategies, tools, and procedures used to gather, organize, and analyze information in a structured and rigorous manner.

3.2.1 Quantitative Research

Quantitative research involves collecting and analyzing numerical data to test hypotheses, identify patterns, and quantify relationships between variables. It employs statistical techniques to conclude the data. It employs structured methods such as surveys, experiments, and statistical analysis to gather data systematically and draw objective conclusions. Quantitative researchers emphasize objectivity, replicability, and generalizability of findings. This research approach relies on standardized measurement tools, closed-ended questions, and statistical techniques such as regression analysis, t-tests, and correlation analysis to analyze data. Quantitative research is well-suited for studying

large populations, showing cause-and-effect relationships, and making predictions based on numerical evidence.

3.2.2 Qualitative Research

Qualitative research explores and understands phenomena through in-depth analysis of non-numerical data such as interviews, observations, and textual analysis. It aims to uncover insights, meanings, and patterns within a specific context. It focuses on subjective interpretations, meanings, and perspectives, often employing methods such as interviews, focus groups, observations, and textual analysis. Qualitative researchers aim to uncover rich, nuanced insights and patterns that may not be captured by quantitative measures alone. This research approach is characterized by flexibility, iterative data collection and analysis, and the use of open-ended questions to allow participants to express their viewpoints freely. Qualitative research is valuable for exploring complex social processes, generating hypotheses, and providing context-rich descriptions of phenomena.

3.2.3 Mixed-Methods Research

Mixed-methods research combines qualitative and quantitative research approaches within a single study. It allows researchers to triangulate data, understand complex phenomena more deeply, and address research questions from multiple perspectives. It involves collecting and analyzing qualitative and quantitative data sequentially or concurrently, allowing researchers to triangulate findings and gain a more comprehensive understanding of complex phenomena. Mixed-methods researchers employ diverse data collection techniques, such as interviews, surveys, observations, and statistical analysis, to

capture the richness and depth of the research topic. Combining qualitative insights with quantitative measures, mixed-methods research offers a holistic view of the phenomenon under study, enhancing the validity and reliability of research findings. This approach is beneficial for exploring multifaceted research questions, validating qualitative findings quantitatively, and providing rich contextual understanding alongside statistical evidence.

A mixed-method research approach was selected for this FGP. This approach will combine components from qualitative and quantitative research methods to provide a comprehensive understanding of the problem domain and to gather diverse perspectives from stakeholders to ensure that specific objectives are achieved.

Table 2

Summary of the Research Methods Used to Achieve Each Specific Objective

Objectives	Research Methods		
	Quantitative	Qualitative	Mixed-Methods
1. To analyze three tools currently used by Oil and Gas companies for maintenance planning (work prioritization and risk-tracking).	Surveys to quantify preferences and usage patterns of existing tools among Oil and Gas companies	Interviews and focus groups to gather insights from maintenance personnel and managers regarding tool usage and needed features	
2. To clearly define the scope of the Smart BI tool project, outlining its boundaries, functionalities, and limitations.	Surveys to quantify stakeholder preferences and priorities regarding work prioritization and risk-tracking needs	Stakeholder meetings and requirements gathering sessions to capture nuanced requirements and priorities.	
3. To develop a well-structured Project Management Plan for the development and implementation of the BI tool.	Project management software and tools for structuring activities, dependencies, and milestones		

Objectives	Research Methods		
	Quantitative	Qualitative	Mixed-Methods
4. Develop a project schedule that outlines all project activities, dependencies, and milestones.	Gantt charts and project management software to create a detailed project schedule		
5. Estimate project costs effectively, plan resource allocations and cost control for the project lifecycle	Financial reports, budget spreadsheets, and cost estimation techniques to analyze project costs and distribute resources.		
6. Develop a robust quality management plan to ensure standards are met, and stakeholder expectations are prioritized.	Quality control checklists and metrics to measure adherence to standards	Stakeholder feedback mechanisms and quality assurance protocols to gather qualitative insights on stakeholder expectations	
7. Estimate project resources and how they can be acquired and managed.	Resource inventory and skills assessment to quantify resource needs and capabilities.		
8. Develop a communication plan that ensures timely and relevant information exchanges.	Surveys to quantify communication effectiveness and identify areas of improvement	Communication protocols and stakeholder meetings to understand communication needs and preferences.	
9. Identify, assess, and plan mitigation of project risks to minimize potential negative impacts.	Risk register and probability-impact matrices to quantify and prioritize project risks.	Risk assessment workshops and qualitative risk analysis techniques to identify and assess project risks	
10. Develop a procurement plan that outlines the procurement processes.			To understand procurement needs and preferences, qualitative interviews and stakeholder meetings are conducted, followed by a quantitative analysis of procurement regulations and processes.

Objectives	Research Methods		
	Quantitative	Qualitative	Mixed-Methods
11. Identify and analyze project stakeholders to effectively manage their expectations.	Stakeholder satisfaction surveys to quantify stakeholder perceptions and satisfaction levels.	Stakeholder mapping exercises and stakeholder interviews to identify and understand stakeholder interests and expectations.	

Note. Each specific objective is constrained to one or more research methods, and these are summarized above. Most of the objectives will entail quantitative research methods.

3.3 Tools

According to the Project Management Institute (PMI), tools refer to specific software applications, templates, techniques, or methodologies that aid project management processes. These tools are designed to help project managers and team members in effectively planning, executing, monitoring, controlling, and closing projects. PMI emphasizes the importance of selecting tools that align with project requirements and objectives to enhance project success and efficiency.

Table 3

Tools and Techniques Used

Objectives	Tools and Techniques
1. To analyze three tools currently used by Oil and Gas companies for maintenance planning (work prioritization and risk-tracking).	• Decision Tree Analysis – a systematic decision-making tool that uses a tree-like model of decisions and consequences. • SWOT Analysis – a technique to identify Strengths, Weaknesses, Opportunities, and Threats. • Expert Judgment – using the expertise of individuals or groups to make informed decisions. • Stakeholder Analysis – assessing the interests and influence of stakeholders. • Focus Groups – discussion-led groups with selected participants. • Interviews – direct conversations with individuals to gather insights.
2. To clearly define the scope of the Smart BI tool project, outlining its boundaries, functionalities, and limitations by eliciting and documenting detailed requirements.	• Scope Statement – a document outlining the project objectives, deliverables, constraints, and assumptions. • Work Breakdown Structure – a hierarchical decomposition of the project scope into smaller manageable components. • Requirements Traceability Matrix – a tool to track and document the origin and status of project requirements. • Interviews - direct conversations with individuals to gather insights. • Prototyping – creating preliminary versions of the tool to gather feedback. • Facilitated Workshops – structured sessions involving stakeholders to elicit requirements, brainstorm, or solve problems.

Objectives	Tools and Techniques
3. To develop a well-structured Project Management Plan for the development and implementation of the BI tool using the analysis and well-defined scope.	• Expert Judgment – using the expertise of individuals or groups to make informed decisions. • Meetings – meetings to discuss project progress, issues, and decisions. • Project Management Information System – software for planning, executing, and controlling projects. • Knowledge management – processes and tools to capture, share, and use project knowledge. • Change control tools – mechanisms to manage and control project scope, schedule, and resource changes.
4. Develop a project schedule that outlines all project activities, dependencies, and milestones.	• Gantt Charts – Bar charts illustrating project schedule tasks over time. • Network Diagrams – graphical representation of project activities and their dependencies. • Critical Path Method is used to identify the longest sequence of independent activities. • Resource Leveling – Adjusting the project schedules to optimize resources. • Schedule Baseline – the approved version of the project schedule used as a reference for project control.
5. Estimate project costs effectively, plan resource allocations and cost control for the project lifecycle.	• Cost Estimation – predicting project costs based on resource requirements and other factors. • Earned Value Management: Integrating project scope, schedule, and cost to assess project performance and forecast outcomes. • Resource Planning – Determining the types and quantities of resources needed for project activities.

Objectives	Tools and Techniques
6. Develop a robust quality management plan to ensure standards are met, and stakeholder expectations are prioritized.	• Quality Metrics – measures used to evaluate project deliverables and processes. • Quality Audits – systematic examination to ensure compliance with quality standards and requirements. • Benchmarking – comparing project performance or processes against industry best practices. • Cause and Effect Diagram – a visual tool to identify and analyze potential causes of problems or quality issues.
7. Estimate project resources and how they can be acquired and managed.	• Resource Breakdown Structure – hierarchical representation of project resources by category or type. • Resource Leveling – Adjusting resource use to balance workloads and optimize project performance. • Resource Acquisition – the process of obtaining and managing project resources. • Virtual Teams – distributed teams collaborating remotely. • Negotiation skills – effectively negotiating agreements, contracts, or resource allocations.
8. Develop a communication plan that ensures prompt and relevant information exchanges.	• Communication Model – the framework that defines communication channels, frequency, and methods for stakeholders. • Information Distribution Tools (Email, Messaging, Calls) – means to disseminate project information. • Meetings
9. Identify, assess, and plan mitigation of project risks to minimize potential negative impacts.	• Brainstorming – Group technique for generating ideas, solutions, or strategies. • SWOT - a technique to identify Strengths, Weaknesses, Opportunities, and Threats. • Probability Impact Matrix – a tool to assess and prioritize project risks based on probability. • Risk Response planning – strategies developed to mitigate, avoid, transfer, or accept risks.

Objectives	Tools and Techniques
10. Develop a procurement plan that outlines the procurement processes.	• Make-or-Buy Analysis – a decision-making process determining whether to produce in-house or procure externally. • Contractual Agreements – formal agreements defining terms and conditions between parties. • Procurement Documents – documents specifying requirements, processes, and deliverables.
11. Identify and analyze project stakeholders to effectively manage their expectations.	• Stakeholder Analysis – identifying and analyzing stakeholder's interests, influence, and expectations. • Power/Interest Grid – classification of stakeholders based on their power and interest in the project. • Stakeholder Engagement Assessment Matrix – a tool to assess and prioritize stakeholder engagement strategies. • Stakeholder Register – a document containing project stakeholders' details, roles, and communication requirements.

Note. The Tools and Techniques to be used in the project are also considered those recommended by the Project Management Institute and indicated in the Project Management Body of Knowledge.

3.4 Assumptions and Constraints

According to the Project Management Institute (PMI, 2021), assumptions and constraints are fundamental concepts in project management. Assumptions are conditions or factors accepted as true or certain for planning purposes despite lacking full confirmation (Kerzner, 2017). These statements influence decision-making and planning processes by supplying a basis for expectations regarding the project's environment, resources, stakeholders, and other relevant factors (PMI, 2021). Project managers must document and confirm assumptions clearly as the project progresses to mitigate risks associated with incorrect assumptions.

On the other hand, constraints are limitations or restrictions that impact the execution of the project, defining boundaries within which the project must operate (Kerzner, 2017). These constraints can encompass factors such as time, budget, scope, quality, and resources (PMI, 2021). Identifying and understanding constraints is crucial for effective project planning and decision-making, as they dictate the project's scope, schedule, and resource allocation. The preliminary constraints are present in Table 4 below:

Table 1

Assumptions and Constraints Considered

Objectives	Assumptions	Constraints
1. To analyze three tools currently used by Oil and Gas companies for maintenance planning (work prioritization and risk-tracking).	• Stakeholders will provide accurate information about their needs and preferences. • Existing tools data will be accessible and reliable for analysis. • The identified tools represent the majority of those used in the industry.	• Limited budget for conducting analyses. • Time constraints for conducting extensive analysis.
2. To clearly define the scope of the Smart BI tool project, outlining its boundaries, functionalities, and limitations by eliciting and documenting detailed requirements.	• Stakeholder requirements will remain stable throughout the project. • The scope statement will accurately capture all project deliverables and goals. • Prototypes will effectively demonstrate key functionalities and gather feedback.	• Resource constraints may limit the scope of the project. • Time constraints for eliciting and documenting detailed requirements.

Objectives	Assumptions	Constraints
3. To develop a well-structured Project Management Plan for the development and implementation of the BI tool using the analysis and well-defined scope.	• Project team members possess the necessary expertise and skills for successful planning and execution. • Project management tools and techniques will be effective in guiding project activities. • Stakeholder engagement will be consistent and supportive throughout the project.	• Limited availability of project team members for meetings and planning sessions. • Organizational policies and procedures may impose constraints on project execution.
4. Develop a project schedule that outlines all project activities, dependencies, and milestones.	• Dependencies between activities are accurately identified and understood. • Project team members adhere to the planned schedule and meet deadlines. • Project scope and requirements remain stable to avoid schedule changes.	• Resource availability may affect the scheduling of project activities. • External dependencies beyond the team's control may affect the schedule.
5. Estimate project costs effectively, plan resource allocations and cost control for the project lifecycle	• Cost estimation techniques provide accurate projections based on the available data. • Resource planning accounts for fluctuations in resource availability and rates. • Earned value management accurately reflects	• Limited financial resources may restrict the allocation of resources to the project. • Budget constraints may require cost-cutting measures.
6. Develop a robust quality management plan to ensure standards are met, and stakeholder expectations are prioritized.	• Stakeholder quality expectations are clearly defined and agreed upon. • Quality metrics are aligned with project goals.	• Time constraints for conducting quality audits and analysis must be considered during FGP development. • Limited resources for implementing quality improvement initiatives will limit strategies to be used.

Objectives	Assumptions	Constraints
7. Estimate project resources and how they can be acquired and managed.	• Resource availability aligns with project requirements and scheduling needs. • Resource leveling techniques effectively balance workloads and optimize resource use. • Virtual teams can collaborate efficiently to ensure execution success.	• Procurement processes must be aligned with company procedures.
8. Develop a communication plan that ensures timely and relevant information exchanges.	• Stakeholder's preferred communication channels are known and accommodated. • Information distribution tools are accessible and reliable for all stakeholders.	• The company is remarkably diverse, so communication constraints due to language barriers must be addressed. • Limited availability of stakeholders for meetings and communications.
9. Identify, assess, and plan mitigation of project risks to minimize potential negative impacts.	• Risks are identified comprehensively through brainstorming and analysis. • Stakeholders will actively participate in risk assessment and response planning activities. • Risk response plans are adaptable to changing landscapes.	• Limited resources may be available to carry out risk mitigation. • Time constraints for conducting risk assessment and response planning.
10. Develop a procurement plan that outlines the procurement processes.	• Contractual agreements provide clear terms and conditions for activities. • Make-or-buy decisions are based on a thorough analysis of cost, quality, and schedule considerations.	• Limited supplier options may restrict choices in procurement.

Objectives	Assumptions	Constraints
11. Identify and analyze project stakeholders to effectively manage their expectations.	• Stakeholder analysis captures all relevant stakeholders' interests, influence, and expectations. • Power/interest grids effectively prioritize stakeholder engagement strategies. • The stakeholder register will be regularly updated to reflect changes in dynamics.	• Limited stakeholder engagement may hinder the identification and analysis process.

Note. The project's assumptions and constraints vary across all the specific objectives. These will be used to craft the related plans and guarantee project success.

3.5 Deliverables

Deliverables are the tangible outcomes necessary to complete or fulfill specific project objectives. They are identifiable products, services, or results that are measurable and verifiable, serving as intermediate outcomes of project activities (Kerzner, 2017). Deliverables may take various forms depending on the project's nature and goals. Moreover, deliverables may also encompass broader achievements or outcomes resulting from project efforts, such as increased revenue or improved customer satisfaction.

The deliverables produced for this FGP encompass a comprehensive set of plans and documents aimed at guiding and managing the development and implementation of the Smart BI tool in the Oil and Gas sector. These deliverables include a Tools Analysis Report, Scope Management Plan, Project Management Plan, Project Schedule Management Plan, Project Costs Management Plan, Project Quality Management Plan, Project Resources Management Plan, Project Communications Management Plan, Project Risk

Management Plan, Project Procurement Management Plan, and Project Stakeholder Management Plan. Each deliverable was tailored to address specific project goals, such as analyzing existing tools, defining scope, managing resources, estimating costs, ensuring quality, mitigating risks, and engaging stakeholders effectively.

Table 5

Deliverables

Objectives	Deliverables
1. To analyze three tools currently used by Oil and Gas companies for maintenance planning (work prioritization and risk-tracking).	• Tools Analysis Report (Current State Gap Assessment)
2. To clearly define the scope of the Smart BI tool project, outlining its boundaries, functionalities, and limitations by eliciting and documenting detailed requirements.	• Scope/Requirements Management Plan o Scope Statement o Work Breakdown Structure (WBS) and WBS Dictionary o Requirements Traceability Matrix o Requirements Documentation
3. To develop a well-structured Project Management Plan for the development and implementation of the BI tool using the analysis and well-defined scope.	• Project Management Plan o Project Charter o Change Control Procedure o Integrated subsidiary plans
4. Develop a project schedule that outlines all project activities, dependencies, and milestones.	• Project Schedule Management Plan o Activity Lists o Activity Attributes o Milestone List o Schedule Baseline o Project Schedule o Duration Estimates o Basis of Estimates
5. Estimate project costs effectively, plan resource allocations and cost control for the project lifecycle.	• Project Costs Management Plan o Cost Estimates and Budget o Basis of Estimates o Cost Baseline o Project Funding Requirements
6. Develop a robust quality management plan to ensure standards are met, and stakeholder expectations are prioritized.	• Project Quality Management Plan o Quality Metrics o Quality Assurance and Quality Control Procedure

Objectives	Deliverables

7. Estimate project resources and how they can be acquired and managed.	• Project Resources Management Plan
	  ○ Resource Requirements
	  ○ Resource Breakdown Structure
	  ○ Basis of Estimates
	  ○ Resource Calendar

8. Develop a communication plan that ensures timely and relevant information exchanges.	• Project Communications Management Plan
	  ○ Channels of Communication
	  ○ Frequency of Communication

9. Identify, assess, and plan mitigation of project risks to minimize potential negative impacts.	• Project Risk Management Plan
	  ○ Risk Register
	  ○ Risk Assessment Procedure
	  ○ Risk Response Plan

10. Develop a procurement plan that outlines the procurement processes.	• Project Procurement Management Plan
	  ○ Procurement Strategy
	  ○ Procurement Statement of Work
	  ○ Make-or-Buy Decision

11. Identify and analyze project stakeholders to effectively manage their expectations.	• Project Stakeholder Management Plan
	  ○ Stakeholder Register
	  ○ Stakeholder Power-Interest Grid

Note. Each of the project's specific objectives is linked to a specific deliverable, shown in the table.

4 RESULTS

Utilizing theoretical and methodological frameworks, a Current State Gap Assessment and Project Management Plan was completed. The Current State Gap Assessment aims to identify and define the discrepancies between the organization's vision for the smart BI tool and the current capabilities of the tools in use. This assessment is critical for elaborating on the scope of the project and ensuring that all necessary areas for improvement are identified and addressed.

In addition, the Project Management Plan outlines the strategies and steps necessary to bridge these gaps. It includes detailed timelines, resource allocation, risk management plans, and key milestones to ensure the project progresses smoothly and stays on track. The plan also incorporates stakeholder communication strategies to keep all parties informed and engaged throughout the project lifecycle. By combining these frameworks, the project is equipped with a clear roadmap and structured approach to achieve the desired outcomes, ultimately enhancing the organization's business intelligence capabilities.

4.1 Current State Gap Assessment

The Current State Gap Assessment is a crucial step that identifies and defines the discrepancies between the organization's vision for a smart BI tool and the current capabilities of the tools in use. This process involves clarifying the desired state by understanding stakeholder expectations and documenting the necessary requirements. It then entails a detailed analysis of the existing tools to inventory their features and capabilities. By comparing the current state with the desired vision, the assessment

pinpoints specific gaps that need to be addressed, providing a clear scope for the project and guiding the development of a targeted Project Management Plan.

4.1.1 Project Sponsor's Future State Vision

The future state vision outlined by the project sponsor is an envisioned outcome that seeks to be realized in the foreseeable future. This vision is a prerogative of individuals, organizations, or groups and serves as a roadmap guiding strategic planning, decision-making, and action. In the Smart BI Tool Project context, the future state vision is explicitly tailored to the scope of the BI tool.

The overarching goal of the Smart BI Tool is to provide a comprehensive overview of the healthcare status of critical equipment deployed on the FPSO (Floating Production Storage and Offloading) unit. This information is intended to support decision-making processes related to work prioritization and risk tracking. To achieve this goal, the project's general goal was deconstructed into specific objectives aligned with the critical success factors of the BI Tool:

1. **Illustrating Production Process Flow and Identifying Key Equipment**: This goal involves mapping out the production process flow and identifying the essential equipment utilized within the selected production systems on the FPSO.
2. **Defining Metrics for Healthcare Status Determination**: The project aims to establish clear metrics to assess the healthcare status of the identified equipment. These metrics are derived from the technical requirements the BI tool's end users specified.

3. **Developing a Color-Coded System for Status Display**: A color-coded system will be implemented to visually represent the identified equipment's healthcare status. This system will provide a quick and intuitive way for users to interpret equipment conditions.
4. **Displaying Threats Affecting Equipment Healthcare**: The BI Tool will also visualize and display potential threats that may affect the healthcare of the identified equipment. This information will help stakeholders in proactively addressing risks and mitigating potential disruptions.

Section 4.2.9, Scope Management Plan, supplies further details and elaborates on these objectives. This section offers a comprehensive breakdown of the project scope, including specific deliverables, timelines, and success criteria for each objective outlined above.

4.1.2 Current State: Analysis of BI Tools Currently in Use

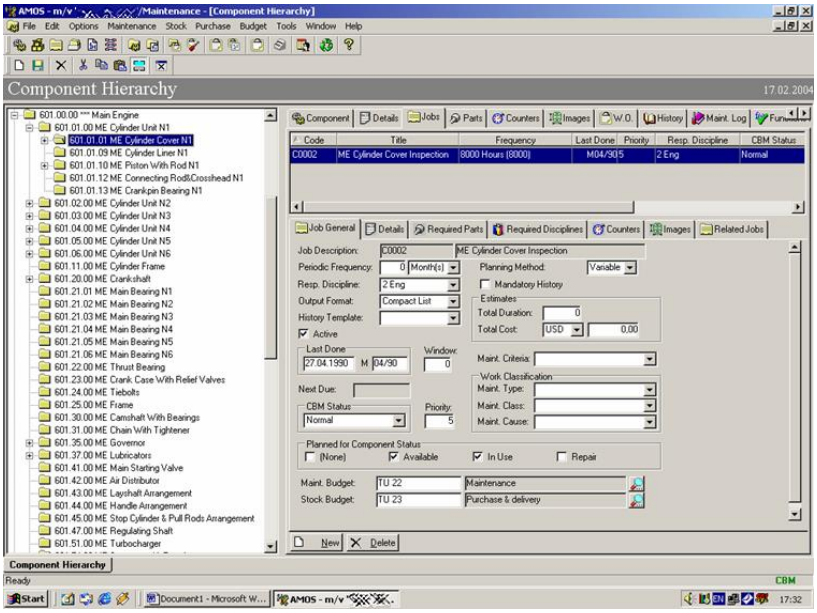
Before developing activities aimed at realizing the project sponsor's future state vision, an extensive evaluation of the existing tools within the operational environment was conducted. The primary goal was to decide whether these tools could meet the project's requirements, whether they could be adapted to align with the envisioned objectives, or if the creation of a new tool was called for. The assessment focused on critical characteristics of the metrics and data sources identified in Section 4.2.10 Requirements Management Plan.

Within the organization, three prominent tools were identified for assessment: AMOS by SpecTec, OsiSoft PI Vision, and Power Automate by Microsoft. Each tool offers distinct functionalities and caters to various aspects of operational management within the maritime, offshore, and oil and gas industries:

- **AMOS (Asset Management Operating System) by SpecTec:** AMOS is a comprehensive software solution meticulously crafted for the maritime, offshore, and oil and gas sectors. It integrates various modules to streamline asset management, maintenance, procurement, and logistics processes, catering to the intricate needs of these industries. The user interface for AMOS by SpecTec is shown in Figure 6.

Figure 6

Photograph of AMOS User Interface

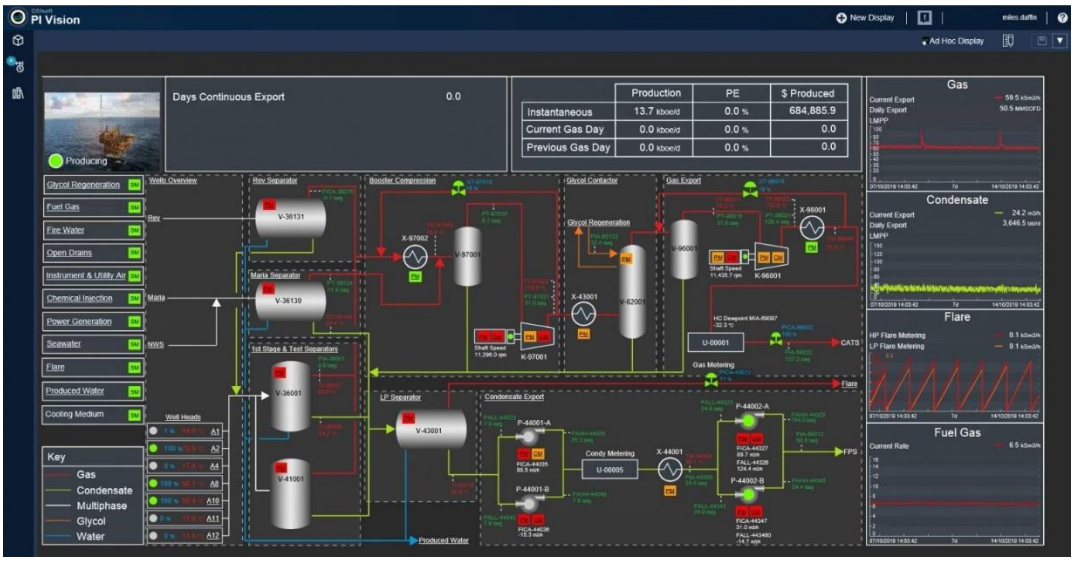


Note. The user interface is not specific to COGL. Adapted from Products, by Soware (https://soware.ru/products/amos-maintenance-and-procurement). In the public domain.

- **PI Vision by OsiSoft:** PI Vision is a robust data visualization tool widely embraced in the oil and gas sector and other industries. It empowers users with real-time monitoring, analysis, and reporting capabilities, providing valuable insights into operational data to enhance decision-making processes. Figure 7 shows a sample display of this application.

Figure 7

Sample Dashboard built in OsiSoft PI Vision



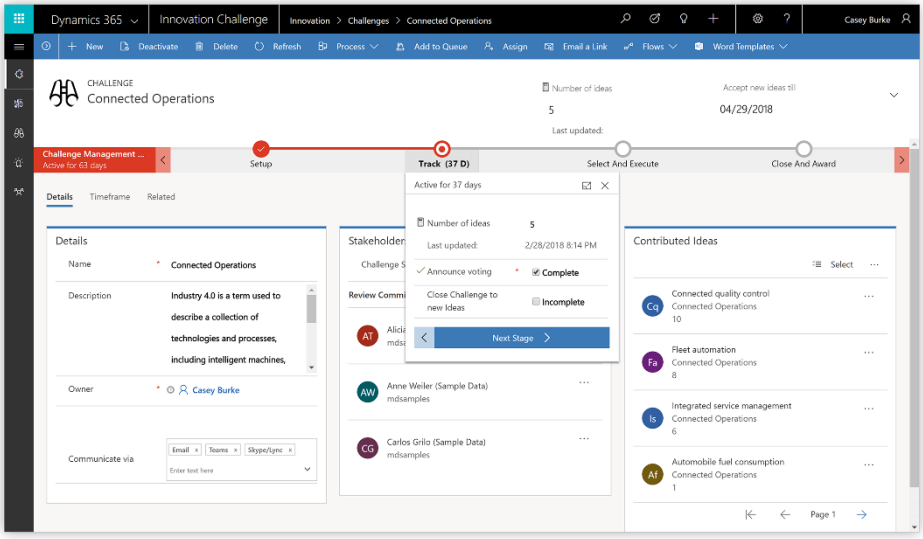
Note. The sample dashboard is not specific to COGL. It was adapted from Eigen (https://eigen.co/pi-vision/). In the public domain.

- **Power Automate (formerly Microsoft Flow):** Power Automate emerges as a potent automation tool easing the creation of automated workflows across a plethora of applications and services. Specifically tailored for the oil and gas sector, Power Automate holds the potential to optimize various processes, drive efficiency

improvements, and foster collaboration among stakeholders. A sample application created using Power Automate is displayed in Figure 8.

Figure 8

Sample Application Created using Power Automate



Note. This application was not made for, nor is it being used by COGL. Adapted from Blog, Tools Review, by Bubble.io (https://bubble.io/blog/microsoft-power-automate-bubble/). In the public domain.

Table 6 encapsulates the findings of this comprehensive assessment, delineating each tool's advantages and disadvantages. These findings are meticulously compared against the key metrics and their corresponding data sources. This comparative analysis serves as a pivotal reference point for informed decision-making regarding selecting and using tools in alignment with the project's overarching objectives.

Table 6

Summary of Analysis Conducted on Existing Tools

TOOL	ASSESSMENT CATEGORIES	
AMOS by SpecTec	**FEATURES:** ●Asset and Maintenance Management by facilitating preventive and corrective maintenance activities. ●Inventory Management of spare parts, consumables, and inventory across locations. ●Procurement and Supply Chain Management is streamlined through automation of requisition, sourcing, purchasing, and supplier management. ●Document Management through a central repository	**ADVANTAGES** ●Provides information on the maintenance activities, such as preventive and corrective maintenance work orders needed to determine threats ●Provides information on all of the required vital equipment
	CURRENT USE CASES ●Offshore Platform Maintenance through the management of preventive and corrective maintenance activities. ●Inventory Management of spares, consumables, and inventory across multiple locations.	**DISADVANTAGES** ●Does not provide information on all of the CAPAs raised because of incident investigations ●Does not provide information on the running status of equipment ●Does not display the information in a graphical way
OsiSoft PI Vision	**FEATURES** ●Real-time Data Visualization ●Customizable Dashboards ●Trend Analyses ●Seamless integration with other OsiSoft products	**ADVANTAGES** ●Displays the information in a graphical way ●Provides running status information on most of the required vital equipment

TOOL	ASSESSMENT CATEGORIES	
	CURRENT USE CASES ●Remote Monitoring and Control of oilfield equipment ●Asset Performance Management through the visualization of key performance metrics.	**DISADVANTAGES** ●Does not supply information on all of the CAPAs raised as a result of incident investigations ●Does not provide information on the maintenance activities, such as preventive and corrective maintenance work orders required to determine threats
Power Automate by Microsoft	**FEATURES** ●Workflow Automation without the need for extensive knowledge of coding. ●Data Manipulation for analysis and extraction ●Monitoring and Analytics to track workflow process efficiency ●Integration of data across multiple Microsoft Products	**ADVANTAGES** ●Provides running status information on some of the required vital equipment ● Provide information on the active corrective maintenance work orders for some of the required equipment
	CURRENT USE CASES ●Data Integration and Reporting from disparate sources such as OsiSoft Databases ●Inventory Management of spares, consumables, and inventory across multiple locations. ●Remote Monitoring and Control of operational equipment by automating repetitive tasks	**DISADVANTAGES** ●Does not provide information on all of the CAPAs raised as a result of incident investigations ●Does not display the information in a graphical way ●Does not provide information for all of the required equipment ●Does not provide information on threats such as overdue corrective and preventive maintenance work orders and active preventive maintenance work orders

Note. The table summarizes the assessment completed by the Business Analyst/Fleet Engineer. None of the three tools assessed could fully meet the needs of the scope required by the Project Sponsor. COGL's Global Document Management System (GDMS) supplies a more detailed analysis report of these three tools.

4.2 Project Management Plan

4.2.1 Purpose of the Plan

The purpose of the Project Management Plan is to serve as the blueprint for overseeing the creation and deployment of the Smart BI Tool. Its primary goal is to ensure that the project progresses in line with its objectives, adheres to agreed-upon schedules and budget constraints, and optimizes efficiency despite resource limitations and time constraints. By detailing these management plans, the Project Management Plan provides a structured framework for guiding project execution and ensuring its success.

The plan outlines a comprehensive strategy encompassing various management aspects to achieve this. It delineates processes for managing:

- Scope: Clearly defining the project's boundaries and deliverables.
- Schedule: Establishing timelines and milestones for prompt completion.
- Cost: Budgeting and monitoring expenses throughout the project lifecycle.
- Change: Handling modifications and adjustments to project parameters.
- Resources: Allocating and managing human, financial, and material resources.
- Quality: Ensuring deliverables meet predefined standards and specifications.
- Risk: Identifying, assessing, and mitigating potential risks that could impact the project.
- Communications: Establishing channels and protocols for effective information dissemination among stakeholders.

4.2.2 Background Information about the Project

Caribbean Oil and Gas Ltd. (COGL) is a leading offshore energy sector player committed to innovation and sustainability. Caribbean Oil and Gas Ltd. (COGL) operates at the forefront of the offshore energy sector, specializing in exploring and producing oil and gas resources. With a commitment to innovation and sustainability, COGL continually seeks to enhance operational efficiency and maximize the value of its assets. However, despite its leadership in offshore energy solutions, COGL needs help prioritizing maintenance activities and tracking associated risks for its Floating Production, Storage, and Offloading (FPSO) units. Though valuable, existing Business Intelligence (BI) tools need a unified approach to supplying the necessary insights for informed decision-making in these critical areas. To address this gap, COGL has embarked on a strategic initiative to develop and implement an integrated BI tool tailored to end users' specific needs in the organization's work-prioritization and risk-tracking processes.

The current landscape at COGL is characterized by the use of multiple BI tools that fail to deliver a streamlined approach to information crucial for work prioritization and risk-tracking concerning FPSO maintenance. These disparate tools hinder efficient data gathering and analysis, resulting in siloed information and suboptimal decision-making processes. The absence of a unified BI solution tailored to the unique requirements of COGL's maintenance operations poses significant challenges in effectively allocating resources, identifying critical maintenance tasks, and mitigating associated risks. This fragmented approach compromises the organization's ability to optimize maintenance activities and ensure the continued reliability and performance of its FPSO units.

To address these challenges, COGL proposes developing and implementing an integrated BI tool specifically designed to meet the needs of end users involved in work-prioritization and risk-tracking processes for FPSO maintenance. This solution combines data from disparate sources, providing a unified platform for accessing, analyzing, and visualizing information critical to informed decision-making. The integrated BI tool will enable COGL to gain actionable insights into maintenance priorities, identify potential risks, and optimize resource allocation strategies by leveraging advanced analytics, real-time monitoring capabilities, and predictive modeling techniques. This integrated approach to BI will empower stakeholders across the organization with the information they need to proactively manage maintenance activities, enhance operational efficiency, and ensure the continued success of COGL's offshore energy operations.

4.2.3 Project Approach

The Smart BI tool project will harness a blend of behavioral techniques, team management strategies, and an agile development methodology to achieve its requirements and objectives effectively. Emphasizing clear communication, conflict resolution, motivation, and empowerment among team members will foster a collaborative and positive work environment. By adopting Agile practices, such as Scrum or Kanban, the project will benefit from iterative development, continuous feedback loops, and adaptability to changing needs. Cross-functional teams will be formed, enabling diverse skill sets to address various project aspects. Regular progress reviews and resource optimization will ensure efficiency and productivity. Tasks will be structured into sprints and user stories,

prioritized based on user needs and business value, focusing on continuous integration and deployment. Feedback mechanisms will help stakeholder and user input, driving iterative refinement of product features. The choice of Agile Methodology is grounded in its flexibility, responsiveness, and ability to deliver incremental value, making it well-suited for projects characterized by evolving requirements. Positioned as a "Pathfinder" project, the Smart BI tool initiative looks to innovate within the Business Intelligence domain, exploring innovative technologies and methodologies to set a precedent for future endeavors and drive progress within the organization and industry.

4.2.4 Goals and Objectives

4.2.4.1 Business Goal and Objective

Goal:

Caribbean Oil and Gas Ltd. envisions itself as a leading global player in the offshore energy sector, serving regional and international markets with reliable and efficient solutions. We strive to be at the forefront of innovation and technology, continuously expanding our capabilities to enhance exploration and production. Our vision encompasses a commitment to environmental stewardship, compliance with the highest safety standards, and a dedication to corporate responsibility, shaping a resilient and sustainable energy future for the world.

Objective:

Caribbean Oil and Gas Ltd. (COGL) stands at the forefront of supplying comprehensive solutions within the offshore energy sector. Specializing in the exploration and production of oil and gas, COGL will offer diverse products and services crucial to the

industry's vitality. Central to its product offerings are Floating Production, Storage, and Offloading (FPSO) units, where COGL is a leader in design, construction, and operation. These FPSO units serve as integral components in efficiently processing, storing, and transporting hydrocarbons extracted offshore. Beyond this core competency, COGL will supply comprehensive subsea solutions encompassing pipelines, control systems, and maintenance services. In addition to its prowess in offshore energy, the company is dedicated to environmental and safety consulting, ensuring compliance with regulations, and championing best practices. As COGL envisions its future, the focus stays on innovation and sustainability, contributing to a resilient and sustainable energy future while maintaining a commitment to the highest ethical and operational standards.

4.2.4.2 Project Goal and Objectives

Within the operational framework of the FPSO (Floating Production Storage and Offloading) unit, a significant challenge exists to manage critical equipment's healthcare status effectively. Currently, a centralized system is not available that supplies real-time insights into equipment health, hindering informed decision-making processes regarding work prioritization and risk management. This monitoring and assessment gap threatens operational continuity, leading to increased downtime and compromised safety measures.

Project Goal:

The project’s primary goal is to develop and implement a Smart BI Tool that provides a comprehensive overview of the healthcare status of operations critical equipment deployed on the FPSO (Floating Production Storage and Offloading) unit. The Smart BI Tool Project presents a comprehensive solution aimed at providing a holistic

overview of equipment health within the FPSO environment. By leveraging advanced analytics and visualization techniques, the Smart BI Tool offers a user-friendly platform tailored to the specific needs of the FPSO unit.

Project Objectives:

The objectives of the project are:

1. To conduct a Current State and Future State Vision Assessment to decide whether the general objective can be achieved using current tools or if a new tool is required.
2. To illustrate the Production Process Flow and Identify Operations Critical Equipment.
3. To define metrics for the healthcare status determination.
4. To develop a color-coded system associated with the healthcare status determined.
5. To display threats affecting equipment healthcare through work orders and corrective/preventive actions.
6. Integrate the earlier deliverables in a Smart BI Tool.

Implementing functionalities such as mapping production process flows, defining clear metrics for healthcare status determination, implementing a color-coded system for status display, and visualizing potential threats affecting equipment health, the project ensures that stakeholders can access actionable insights for proactive decision-making and risk mitigation. This solution enhances operational efficiency and improves asset management practices, contributing to the long-term sustainability and safety of FPSO operations.

4.2.5 Assumptions

The Project Management Plan makes use of the following assumptions:

1. It is assumed that stakeholders will actively engage and provide necessary support and input throughout the project, ensuring alignment with organizational goals and objectives.
2. The availability of skilled personnel, financial resources, and technological infrastructure necessary for the successful development and implementation of the BI tool is assumed.
3. It is assumed that the required data for the BI tool's functionality, including historical equipment performance data and production process information, will be accessible and readily available.
4. The BI tool is assumed to be scalable and capable of accommodating future growth and evolving business needs within the FPSO environment without significant reengineering or redevelopment efforts.
5. Senior management is assumed to demonstrate commitment and leadership support for the project, facilitating decision-making and resource allocation as needed.

4.2.6 Constraints

4.2.6.1 Project Constraints. These constraints include:

- Resources/Budget—The project is constrained by budget limitations, requiring careful resource allocation and prioritization to ensure cost-effectiveness.
- Schedule—Predefined project timelines and deadlines must be adhered to, limiting

the duration available for project execution and delivery.

- Scope—The project must operate within the technological constraints of the organization's existing infrastructure and systems, which could potentially limit the scope and functionality of the BI tool.
- Scope – Compliance with industry regulations and standards imposes constraints on certain project activities and deliverables, necessitating adherence to specific protocols and procedures implemented within the organization.
- Resource – Constraints related to the availability of skilled personnel and technology may affect project execution and delivery timelines, requiring careful resource management and planning.

4.2.6.2 Critical Dependencies. The project's critical dependencies are identified in the Schedule Baseline presented in Appendix 6 and the Schedule Network Diagram illustrated in Appendix 7.

4.2.7 Teams, Roles, and Responsibilities

Data Operations and Development Team:

The Data Operations and Development Team comprises developers and data scientists responsible for designing, developing, testing, and delivering the Smart BI tool.

Deployment Team:

The Deployment Team is responsible for deploying the Smart BI tool into the production environment and ensuring its ongoing operation and maintenance. They manage the infrastructure, monitor performance, and provide support as needed.

Project Sponsor:

The Project Sponsor is a senior executive responsible for championing the project, providing strategic direction, securing resources, and ensuring alignment with organizational goals.

Project Manager:

The Project Manager oversees the overall execution of the project. They are responsible for the planning, organizing, coordinating, and controlling of project activities. They serve as the primary point of contact for stakeholders and are accountable for delivering the project on time, within budget, and according to quality standards.

Product Owner:

The Product Owner represents the stakeholders' interests and is responsible for maximizing the product's value. They prioritize features, manage the product backlog, and ensure that the team delivers functionality that meets the business's needs.

Scrum Master:

The Scrum Master is responsible for facilitating the Scrum process and removing impediments that hinder the team’s progress. They coach the team on agile practices, promote self-organization, and foster a collaborative environment.

Developers and Data Scientists:

The Developers and Data Scientists design the structure, integration, and management of the user interface and the data within the BI tool. They ensure data quality, performance, security, compliance with architectural standards, and realization of user stories (features).

Business Analyst/ Fleet Engineer:

The Business Analyst/Fleet Engineer works closely with stakeholders to elicit, analyze, and document requirements for the tool. They translate business needs into functional specifications and collaborate with the development team to ensure alignment between business goals and technical implementation.

Stakeholders:

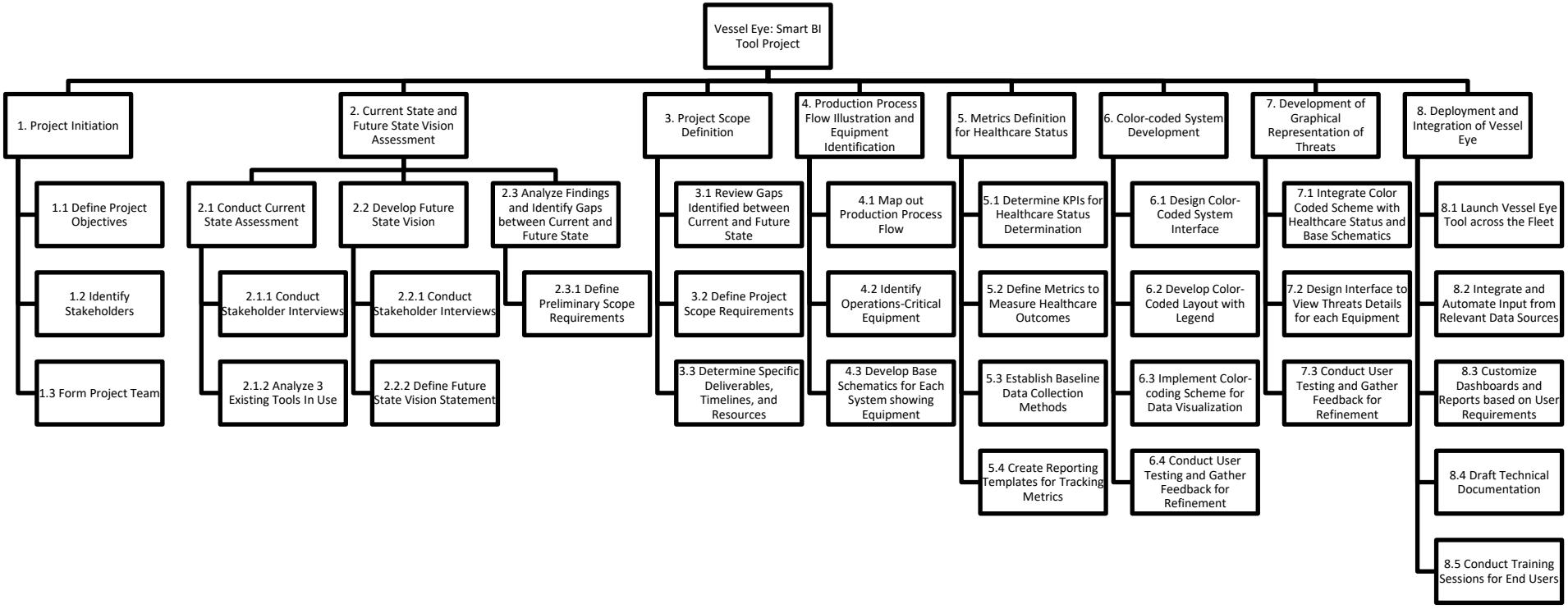
Stakeholders include individuals or groups with an interest or influence in the project. These will consist of end-users, executives, and other relevant parties. Their involvement is crucial for defining the requirements, providing feedback, and ensuring the project's overall success.

4.2.8 Work Breakdown Structure

4.2.8.1 Project Work Breakdown Structure.

Figure 9

Work Breakdown Structure for the Vessel Eye BI Tool Project



Note. The WBS shows the project's various hierarchy levels, including the critical activities to be completed.

4.2.8.2 Work Breakdown Structure Dictionary.

Figure 10

Work Breakdown Structure Dictionary for the Vessel Eye BI Tool Project

WBS Level	WBS Code	Deliverable	Definition	Responsible	Resources Required	Acceptance Criteria	Constraints	
							Cost	Time
2	1	**Project Initiation**					$ 300.00	3 days
3	1.1	Define Project Objectives	Clearly articulate the goals and objectives of the project.	Project Sponsor	Project Manager, Project Sponsor	Objectives documented and approved by stakeholders	$ 100.00	1 day
3	1.2	Identify Stakeholders	Identify all individuals or groups who will be affected by or can influence the project.	Project Manager	Project Manager, Project Sponsor	Stakeholder list finalized and confirmed	$ 100.00	1 day
3	1.3	Form Project Team	Assemble a team with the necessary skills and expertise to execute the project.	Project Manager	Project Manager	Project team established	$ 100.00	1 day
2	2	**Current State and Future State Vision Assessment**					$ 900.00	8 days
3	2.1	Conduct stakeholder interviews	Gather insights and perspectives from key stakeholders to inform project planning.	Product Owner	Project Manager, Product Owner	Stakeholder feedback collected and analyzed	$ 150.00	3 days
3	2.2	Analyze 3 exisiting tools in use	Evaluate the strengths and weaknesses of three existing tools relevant to the project.	Fleet Engineer	Fleet Engineer, Product Owner	SWOT analysis completed for each tool	$ 300.00	1.5 days
3	2.3	Develop preliminary budget	Create an initial budget estimate outlining projected costs for the project.	Project Manager	Project Manager	Budget estimate documented and approved	$ -	1 day
3	2.4	Conduct stakeholder interviews	Gather insights and perspectives from key stakeholders to inform project planning.	Product Owner	Project Manager, Product Owner	Stakeholder feedback collected and analyzed	$ 150.00	4 hrs
3	2.5	Define Future State Vision	Clearly define the desired future state and objectives of the project.	Project Manager	Product Owner	Future state vision documented and approved	$ 100.00	4 hrs
3	2.6	Define preliminary scope requirements	Outline the initial scope and boundaries of the project, including high-level deliverables and timelines.	Project Manager	Project Manager, Product Owner	Scope requirements documented and approved	$ 200.00	4 hrs
2	3	**Project Scope Definition**					$ 800.00	4 days
3	3.1	Review gaps identified between Current and Future State	Identify discrepancies between the current state and the future state vision to inform project scope definition.	Project Manager	Project Manager, Product Owner	Gaps documented and addressed	$ 200.00	1 day
3	3.2	Define project scope requirements	Clearly outline the specific deliverables, milestones, and objectives of the project.	Project Manager	Project Manager, Product Owner	Scope requirements documented and approved	$ 100.00	1 day
3	3.3	Determine specific deliverables, timelines, and resources	Establish clear timelines, resource allocations, and dependencies for project deliverables.	Project Manager	Project Manager	Deliverables, timelines, and resources defined	$ 500.00	2 days
2	4	**Production Process Flow Illustration and Equipment Identification**					$ 600.00	12 days
3	4.1	Map out production process flow	Diagram the sequence of steps involved in the production process.	Fleet Engineer	Fleet Engineer, Developers and Data Scientist	Process flow diagram created	$ 200.00	4 days
3	4.2	Identify operations critical equipment	Identify the equipment and machinery essential for the production process.	Fleet Engineer	Fleet Engineer, Developers and Data Scientist	Critical equipment identified and documented	$ 200.00	2 days
3	4.3	Develop base schematics for each system showing equipment	Create schematic diagrams illustrating the layout and placement of equipment within each system.	Product Owner	Product Owner, Developers and Data Scientist	Schematics developed and approved	$ 200.00	4 days
2	5	**Metrics Definition for Healthcare Status**					$ 500.00	30 days
3	5.1	Determine KPIs for healthcare status determination	Define key performance indicators (KPIs) to assess healthcare status.	Fleet Engineer	Fleet Engineer	KPIs identified and documented	$ 100.00	5 days
3	5.2	Define metrics to measure healthcare outcomes	Establish metrics and criteria for measuring healthcare outcomes.	Fleet Engineer	Fleet Engineer	Metrics defined and aligned with project goals	$ 100.00	5 days
3	5.3	Establish baseline data collection methods	Determine the methods and processes for collecting baseline data related to healthcare outcomes.	Developers and Data Scientist	External Consultant, Developers and Data Scientist	Data collection methods established and approved	$ 150.00	10 days
3	5.4	Create reporting templates for tracking metrics	Develop templates and formats for reporting and tracking healthcare metrics.	Product Owner	Developers and Data Scientist	Reporting templates created and validated	$ 150.00	10 days
2	6	**Color-coded System Development**					$ 600.00	11.67 days
3	6.1	Design color-coded system interface	Design the interface of the system using a color-coded scheme for data visualization.	Developers and Data Scientist	Developers and Data Scientist	Interface design completed and approved	$ 100.00	0.67 days
3	6.2	Develop color-coded layout with legend	Create a layout featuring color-coded elements and a legend for interpretation.	Developers and Data Scientist	Developers and Data Scientist	Layout developed and approved	$ 100.00	2 days
3	6.3	Implement color-coding scheme for data visualization	Apply the color-coding scheme to visualize data effectively within the system.	Developers and Data Scientist	Developers and Data Scientist	Color-coding implemented and validated	$ 250.00	2 days
3	6.4	Conduct user testing and gather feedback for refinement	Test the system with users and gather feedback to refine and improve its usability.	Product Owner	Product Owner, Fleet Engineer	User feedback collected and implemented	$ 150.00	7 days
2	7	**Development of Graphical Representation of Threats**					$ 950.00	8 days
3	7.1	Integrate color-coded scheme with healthcare status and base schematics	Merge the color-coded system interface with healthcare status indicators and base schematics.	Developers and Data Scientist	Developers and Data Scientist, External Consultant	Integration completed and validated	$ 400.00	1.5 days
3	7.2	Design interface to view threats details for each equipment	Create an interface allowing users to view detailed threat information for each equipment.	Developers and Data Scientist	Developers and Data Scientist, External Consultant	Interface designed and approved	$ 400.00	3 days
3	7.3	Conduct user testing and gather feedback for refinement	Test the interface with users and gather feedback to refine and enhance its functionality.	Product Owner	Product Owner, Fleet Engineer	User feedback collected and implemented	$ 150.00	3.5 days
2	8	**Deployment and integration of Vessel Eye**					$2,350.00	18.58 days
3	8.1	Launch Vessel Eye BI Tool across the fleet	Roll out the Vessel Eye BI Tool to all vessels in the fleet.	Product Owner	Product Owner, Fleet Engineer	Tool launched and accessible to all vessels	$ 400.00	2.33 days
3	8.2	Integrate and automate input from relevant data sources	Integrate data inputs from relevant sources into the Vessel Eye BI Tool and automate data collection processes.	Developers and Data Scientist	Developers and Data Scientist, External Consultant	Data integration completed and validated	$ 500.00	7 days
3	8.3	Customize dashboards and reports based on User Requirements	Tailor dashboards and reports within the Vessel Eye BI Tool to meet user-specific needs and preferences.	Developers and Data Scientist	Developers and Data Scientist, External Consultant	Dashboards and reports customized and approved	$ 200.00	4 days
3	8.4	Draft technical documentation and training material	Prepare technical documentation and training materials to support users in utilizing the BI Tool effectively.	Fleet Engineer	Documents	Documentation created and validated	$ 500.00	3 days
3	8.5	Conduct training sessions for end users	Deliver training sessions to end users to familiarize them with the features and functionality of the BI Tool.	Fleet Engineer	Training Sessions	Training sessions conducted and feedback received	$ 750.00	2.25 days

Note. The WBS Dictionary outlines the Control Accounts associated with Level 2 of the WBS and Level 3 activities. It includes details on the work to be completed, acceptance criteria, cost and time baselines, and the stakeholders responsible for those activities.

4.2.9 Scope Management Plan

Scope Management is the collection of processes that ensure that the project includes all the work needed to complete it while excluding all work that is not necessary to complete it. The Scope Management Plan details how the project scope will be defined, developed, and verified. It clearly defines who handles managing the project's scope and acts as a guide for managing and controlling the scope.

Scope management will be the Project Manager's sole responsibility for this project. The Scope Statement defines this project's scope, Work Breakdown Structure (WBS), and WBS Dictionary. The Project Manager, Stakeholders, or any project team member may initiate proposed scope changes. All change requests will be submitted to the Project Manager, who will then evaluate the requested scope change. Upon acceptance of the scope change request, the Project Manager will submit the scope change request to the Change Control Board and Project Sponsor for approval. Section 4.3.11, Change Management Plan, further outlines the change control process.

4.2.9.1 Stakeholder Register.

Table 7

Vessel Eye BI Tool Project Stakeholder Matrix

ID	Stakeholder	Functional Area	Roles - Responsibilities	Main Expectations	Major Requirements	Influence/Impact (Low or High)
1	Data Operations and Development Team	Data Management and Development	Design, develop, test, and deliver the Smart BI tool.	Ensure data accuracy, integrity, and availability.	Use of robust data integration tools, data security, compliance	High
2	Deployment Team	IT Operations	Deploy the Smart BI tool into the production environment.	Ensure smooth deployment and ongoing operation.	Proficiency in deployment tools, infrastructure management, monitoring	Low
3	Project Sponsor	Project Management	Champion the project, provide strategic direction and secure resources.	Project success and alignment with organizational goals.	Commitment to project funding and executive support.	High
4	Project Manager	Project Management	Oversee project execution, coordinate tasks, and manage resources.	On-time delivery, within budget, according to scope.	Effective project planning, resource allocation, risk management, and adherence to schedule and budget	High
5	Product Owner	Project Management	Represent stakeholders, prioritize features, and maximize product value.	Deliver functionality that meets business needs.	Continuous stakeholder engagement, prioritization, iterative development, and feedback loops	High
6	Scrum Master	Project Management	Facilitate the Scrum process, remove impediments, and coach the team.	High-performing, self-organizing team.	Promotion of agile principles, facilitation skills, and coaching.	High
7	Developers and Data Scientists	Software Development	Design UI structure, integrate and manage data within BI tool.	Ensure data quality, performance, and security.	Adherence to coding standards, data validation, and testing	Low

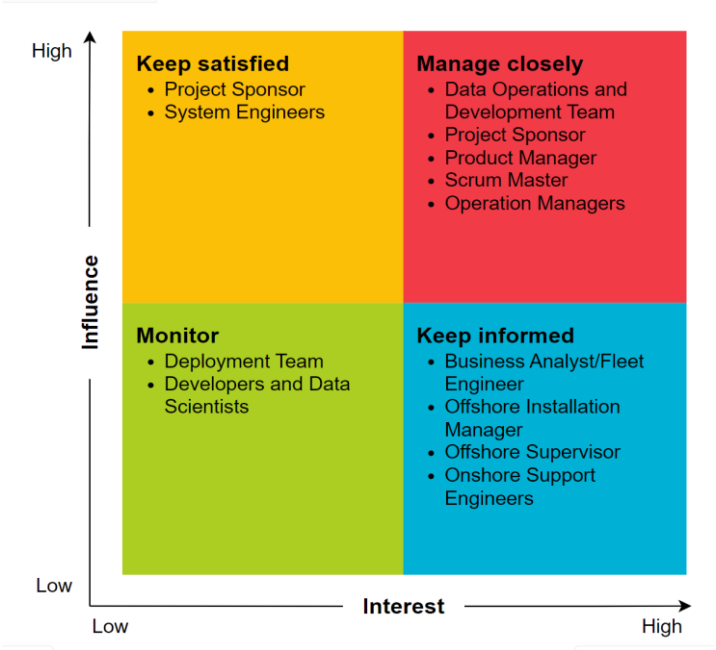
ID	Stakeholder	Functional Area	Roles - Responsibilities	Main Expectations	Major Requirements	Influence/Impact (Low or High)
8	Business Analyst/Fleet Engineer	Business Analysis	Elicit, analyze, and document requirements to ensure alignment.	Functional specifications aligned with business goals.	Understanding of business processes, technical expertise, and collaboration.	High
9	Operation Managers	Operations	Provide input on operational needs and ensure tool utilization.	Increased operational efficiency and reduced costs.	Insight into operational workflows, user adoption strategies, training, and support mechanisms	Low
10	System Engineers	Technical Support	Ensure compatibility and performance of the Smart BI tool.	Stable, scalable infrastructure.	Fit-for-purpose solution that aids work prioritization and risk-tracking for their assigned systems	Low
11	Offshore Installation Manager	Operations	Oversee installation and maintenance of Smart BI tool offshore.	Smooth installation process, minimal downtime.	Fit-for-purpose solution that aids work prioritization and risk-tracking for the vessel offshore	Low
12	Offshore Supervisor	Operations	Supervise offshore operations and support the installation team.	Safe, efficient operations offshore.	Fit-for-purpose solution that aids work prioritization and risk-tracking for offshore operations	Low
13	Onshore Support Engineers	Technical Support	Provide support and troubleshooting for Smart BI tool users.	Quick issue resolution and minimal downtime.	Fit-for-purpose solution that aids work prioritization and risk-tracking for offshore operations	Low

Note. The stakeholder register highlights all parties impacted by the project, both directly and indirectly. This register will be continuously monitored and updated. The level of influence and impact is evenly split between all stakeholders.

4.2.9.2 Stakeholder Matrices. The stakeholder analysis was conducted to help the project manager identify critical stakeholders and tailor communication and engagement strategies to manage relationships and meet project objectives effectively. The resulting stakeholder matrices are shown in Figures 11 and 12.

Figure 11

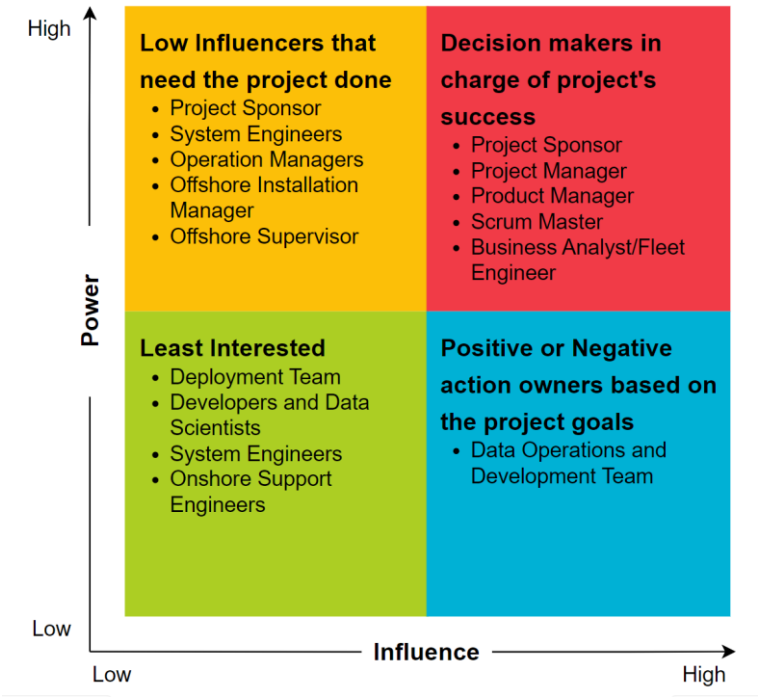
Stakeholder Influence/Interest Matrix



Note. The stakeholder analyses reveal high influence and interest from crucial project leaders such as the Project Sponsor, Manager, and Product Manager. Operational teams like Data Operations and Development show moderate influence but high interest, while others like Deployment Team and Developers hold lower influence and interest levels. The deployment team and developers show low levels of influence and interest since they are not the end-users of the tool. The management team and operational teams are high-interest stakeholders since they will use the tool and the KPIs on an ongoing basis.

Figure 12

Stakeholder Power/Influence Matrix



Note. The table summarizes stakeholder influence and power levels in the Smart BI Tool project. Key stakeholders such as the Project Sponsor, Project Manager, and Product Manager hold high influence and power. At the same time, teams like Deployment and System Engineers have lower levels of influence and power. The Project Sponsor, Manager, and Product Manager hold high influence and power due to their pivotal roles in decision-making, resource allocation, and project direction. They have the authority to define project goals, secure resources, and drive the project forward, making them influential figures in shaping the project's success.

4.2.9.3 Scope Definition. The scope for the Vessel Eye project was meticulously crafted through an exhaustive requirements-gathering process. Initially, a comprehensive

analysis was conducted on the existing software landscape within the company, incorporating insights garnered from employee and user feedback. This data served as the foundation for developing essential project documents such as the requirements documentation, requirements management plan, and requirements traceability matrix, outlining the functionalities and features necessary for the new software application.

Furthermore, the project description and deliverables were formulated through a collaborative effort involving subject matter experts, software design, technical support, programming, and business applications. Leveraging their ability, valuable insights were obtained to ensure the project aligned with the company's goal of enhancing work prioritization and risk tracking. This expert judgment process eased the identification of the most efficient approaches to fulfill the original project requirements, thereby laying the groundwork for a successful implementation of the Vessel Eye BI Tool.

4.2.9.4 Scope Statement. This project entails developing a business intelligence (BI) tool aimed at improving work prioritization and risk tracking within the oil and gas industry. With a budget of $7,000, excluding contingencies and reserves, and a period of 4 months, the BI tool will be designed to provide advanced analytics and visualization capabilities, enabling efficient decision-making and risk management insights. The project scope encompasses the BI tool's design, development, and testing phases, ensuring alignment with industry-specific requirements and compatibility with existing infrastructure. Post-implementation support and ongoing maintenance lie beyond this project's scope, while internal resources will be solely used for its execution. Assumptions

include stakeholder commitment and the availability of requisite expertise for successful project completion within the specified constraints.

4.2.9.5 Scope Verification and Control

Scope Verification encompasses how the different deliverables will be verified against the original scope and how the deliverables of the project will be formally accepted. Scope Control will enable monitoring of the status of the project's scope and details the change process for making changes to the scope baseline. Both components will be managed through Lean Kit Agile Place. Lean Kit Agile Place is an application that provides a web-based platform for managing projects using a Kanban board.

As this project progresses, the Project Manager will verify interim project deliverables (iterations) against the original scope defined in the scope statement, WBS, and WBS Dictionary. Features and deliverables are demonstrated to stakeholders during the sprint reviews, and stakeholders can provide feedback, which will be incorporated into future iterations. Once the Project Manager verifies that the scope meets the requirements defined in the project plan, the Project Manager and Sponsor will meet for formal acceptance of the deliverable. During this meeting, the Project Manager will present the deliverable to the Project Sponsor for formal approval. The Project Sponsor will accept the deliverable by signing a project deliverable acceptance document. This will ensure that project work remains within the scope of the project on a consistent basis throughout its life.

Scope control will be achieved through continuous prioritization and adjustment of the product backlog. The product owner manages scope by adding, removing, or reprioritizing user stories based on changing business needs and feedback from stakeholders.

4.2.10 Requirements Management Plan

Requirements will be divided into two categories: project requirements and product requirements. Project requirements are identified to meet the project's needs and ensure its completion and readiness to hand over to operations. These consist primarily of non-technical requirements. Product requirements are the requirements identified to meet the product's technical specifications because of the project: the Vessel Eye BI Tool. These will include requirements to ensure that performance specifications are met, information sources are appropriately linked, and business critical KPIs are identified and documented.

4.2.10.1 Requirements Management Approach. The approach for requirements management for the Vessel Eye Tool project will be divided into four key areas: requirements identification, requirements analysis, requirements documentation, and ongoing requirements management.

- **Requirements Identification:** The project team will employ various techniques, including interviews, focus groups, workshops, and surveys, to gather requirements from project stakeholders comprehensively.
- **Requirements Analysis:** Following collection, the project team will analyze requirements to categorize them as project or product-related. They will determine where each requirement fits within the Work Breakdown Structure (WBS) and assign accountability and priority. Additionally, metrics and acceptance criteria will be established for all requirements to gauge fulfillment.
- **Requirements Documentation:** Identified and analyzed requirements will be documented and provided to the Product Manager and Scrum Master. They will be

integrated into the project plan, and the team will decide on each requirement's tracking and reporting methodology. All requirements will be included in the project requirements checklist, which must be completed before formal project closure.

- **Ongoing Requirements Management:** Throughout the project lifecycle, the project manager will ensure that team members report requirement status and address any issues or concerns related to the assigned requirements. Should requirement changes be needed, the team will adhere to the established change control process outlined in the Change Management Plan to propose modifications and obtain approval.

4.2.10.2 Requirements Prioritization Process. The Product Manager will coordinate stakeholder meetings to decide the priority of all project requirements. A three-level scale will be used for prioritizing requirements, as outlined below:

Priority Level Definition:

- **High:** These requirements are considered mission-critical, essential for the success of the project or product, or necessary for advancing to the next project phase.
- **Medium:** These requirements contribute to the functionality and operations of the product or process and can be addressed in subsequent product releases.
- **Low:** These requirements entail quality improvements or enhancements to functional processes, which are considered desirable if resources and time allow for their implementation.

This prioritization framework will guide distributing resources and efforts toward meeting project objectives effectively and efficiently.

4.2.10.3 Requirements Traceability Matrix. Below is the requirements traceability matrix for the Vessel Eye BI Tool project. The matrix ensures that all product requirements are completed following the project charter. It supplies a thread for all product requirements through design, testing, and user acceptance.

Table 8

Requirements Traceability Matrix for the Vessel BI Tool Project

Requirements				Relationship Traceability			
ID	**Priority Level**	**Requirement**	**Sources**	**Business Objective**	**Deliverables**	**Verification**	**Validation**
1	Medium	Analysis of current tools used by the organization	Onshore Support Engineers, System Engineers, Deployment Team, Data Operations and Development Team	To conduct a Current State and Future State Vision Assessment to determine if current tools meet the objective or if a new tool is required.	Assessment report comparing current tools	Review of assessment report	Ensure the assessment report provides insights into current tools and their suitability for meeting project objectives.
2	High	Illustration of the production process flow	System Engineers	To illustrate the Production Process Flow and identify Operations Critical Equipment.	Production process flow diagram	Inspection of production process flow diagram	Ensure the diagram accurately depicts the production process and identifies critical equipment.
3	High	Identification of the essential critical equipment offshore	Operation Managers, Offshore Installation Manager	To define metrics for the healthcare status determination.	List of identified critical equipment offshore	Cross-reference with offshore installation records	Ensure all critical equipment offshore is accurately identified.

Requirements				Relationship Traceability			
ID	**Priority Level**	**Requirement**	**Sources**	**Business Objective**	**Deliverables**	**Verification**	**Validation**
4	High	Definition of the metrics for the healthcare status determination	System Engineers, Business Analyst/Fleet Engineer	To define metrics for the healthcare status determination.	A document outlining healthcare status metrics	Review of metric definitions	Ensure metrics are clearly defined and align with project objectives.
5	High	Development of the color-coded system to display healthcare status based on associated metrics	Onshore Support Engineers, System Engineers	To develop a color-coded system for displaying healthcare status based on associated metrics.	Color-coded system for displaying healthcare status	Inspection of color-coded system implementation	Ensure the system accurately reflects the healthcare status based on defined metrics.
6	High	Derive data and information sources to input into the dashboard	Developers and Data Scientists	To create a link between the data sources and feed the metrics defined.	Data and information sources for the dashboard	Examination of data sources	Ensure the derived sources align with project requirements and metrics.
7	High	Create a link between the data sources to feed the metrics defined	Developers and Data Scientists	To create a link between the data sources and feed the metrics defined.	Established data link between sources and metrics	Testing data link functionality	Ensure the data link accurately feeds the metrics as intended.

Requirements				Relationship Traceability			
ID	**Priority Level**	**Requirement**	**Sources**	**Business Objective**	**Deliverables**	**Verification**	**Validation**
8	High	Visualize and display potential threats by integrating the metrics, illustration, and color-coded system deliverables.	Developers and Data Scientists	To visualize and display potential threats affecting equipment healthcare.	Visualization of potential threats based on metrics	Review of threat visualization	Ensure potential threats are accurately displayed and actionable based on defined metrics and color-coded systems.
9	High	Develop training material for end-users of the tool	Business Analyst/ Fleet Engineer, Developers	To develop training material for end-users to utilize the Smart BI Tool effectively.	Training material for end-users	Review of training material	Ensure training material effectively educates end-users on tool usage.
10	Medium	Develop technical documentation to outline creation and maintenance details for the tool.	Developers and Data Scientists	To provide technical documentation for tool creation and maintenance guidance.	Technical documentation outlining creation and maintenance	Examination of technical documentation	Ensure documentation provides comprehensive guidance for tool creation and maintenance.

Note. All requirements identified for this project are listed as medium or high priority. If they are not met, the scope and usability of the BI tool will be significantly inhibited.

4.2.11 Change Management Plan

The Change Management Plan for the Vessel Eye BI Tool Project outlines how changes will be managed, defines what constitutes a change, clarifies the role of the change control board, and establishes the change management process. All stakeholders must adhere to this plan when submitting or requesting changes, following the outlined procedures meticulously.

The Change Management strategy for the Smart BI Tool Project guarantees that all suggested changes undergo thorough definition, review, and agreement processes for proper implementation and dissemination to stakeholders. This ensures approval and implementation solely for project scope and benefit changes. It is made up of three key components: confirming changes align with project scope and benefits, defining implementation methods, and overseeing change management during implementation.

4.2.11.1 Definition of Change. Various changes may be requested and considered for the Vessel Eye BI Tool Project. These changes may cause project documentation and communication adjustments to incorporate approved changes into the project plan and notify stakeholders accordingly. Types of changes include:

- **Scheduling Changes**: Alterations affecting the approved project schedule, potentially requiring fast tracking, crashing, or re-baselining based on the impact's significance.

- **Budget Changes**: Modifications affecting the approved project budget may necessitate additional funding requests, release unnecessary funds, or adjust project or management reserves. This may involve changes to the cost baseline.
- **Scope Changes**: Revisions essential to the project's scope, arising from unforeseen requirements not initially planned for. These changes may influence the budget and schedule, requiring updates to the Work Breakdown Structure (WBS), project scope statement, and other relevant project documentation.

4.2.11.2 Change Control Board. The Change Control Board (CCB) holds authority over Smart BI Tool Project change requests. It reviews requests, assesses impacts on risk, scope, cost, and schedule, and either approves or denies them. The CCB will be comprised of the following stakeholders:

- Project Sponsor - Chairperson
- Project Manager – Co-chairperson
- Product Manager – CCB Member
- Business Analyst/Fleet Engineer – CCB Member

4.2.11.3 Change Control Process. The Change Control Process for the Vessel Eye BI Tool project will align with the organization's standard change management procedures while accommodating a hybrid project approach. The Project Manager is responsible for executing the change management process for each request. The change process is made up of the following stages:

- **Stage 1 - Identify the need for a change (Stakeholders):** Change requestors will complete a form and submit it to the Project Manager.
- **Stage 2 - Log change in the register (Project Manager):** The Project Manager maintains a log of all change requests throughout the project's lifecycle.
- **Stage 3 - Evaluate the change (Project Manager, Team, Requestor):** The Project Manager conducts a preliminary analysis of the change's impact on risk, cost, schedule, and scope, seeking input from team members and requestors.
- **Stage 4 - Submit a change request to CCB (Project Manager):** The Project Manager submits the change request and preliminary analysis to the Change Control Board (CCB) for review.
- **Stage 5 - Obtain Decision on change request (CCB):** The CCB deliberates on the proposed change, approving or rejecting it based on submitted information.
- **Stage 6 - Implement change (Project Manager):** If approved, the Project Manager updates project documentation accordingly.

4.2.12 Cost Management Plan

The Cost Management Plan outlines how the project's costs will be managed throughout the project’s lifecycle. For the Vessel Eye BI Tool, the Project Manager is responsible for managing and reporting on the project’s cost throughout the project. The cost performance for each preceding month is expected to be presented and reviewed during the monthly project status meeting. The cost performance will be measured using earned value management.

Cost management for this project will be executed at the second level of the Work Breakdown Structure (WBS), where Control Accounts (CA) are established to monitor costs. Earned Value calculations will be applied to these CA to gauge and oversee the project's financial performance. While activity cost estimates are meticulously outlined within the work packages, the primary focus of cost management lies at the third level of the WBS for accuracy.

Recognition for completed work will occur at the work package level. Initiation of work packages will merit 50% credit, with the remaining 50% credited upon full completion of all defined tasks within the work package. Costs and work hours may be rounded to the nearest dollar and whole hour.

Any cost variances of +/- 0.1 in the cost and schedule performance indexes will trigger a cautionary status change, reflected as yellow in project status reports. Variances exceeding +/- 0.2 will escalate the status to an alert stage, denoted by red in project reports. The Project Manager will be tasked with implementing corrective actions to bring cost and schedule performance indexes below the alert threshold. Such actions need a project change request, mandating approval from the Project Sponsor to align with the project's scope.

4.2.12.1 Measuring Project Costs. The project's performance will be assessed using Earned Value Management, employing four key metrics to evaluate cost performance:

- Schedule Variance (SV)
- Cost Variance (CV)
- Schedule Performance Index (SPI)
- Cost Performance Index (CPI)

Suppose the Schedule Performance Index (SPI) or Cost Performance Index (CPI) deviates by 0.1 to 0.2 from the planned values. In that case, the Project Manager must report the exception and provide an explanation. If the deviation exceeds 0.2, the Project Manager must report the exception, along with a detailed corrective plan to restore project performance to acceptable levels. Table 8 outlines the color coding that will be used to report cost performance:

Table 9

Earned Value Management Performance Measures

Performance Measure	Yellow	Red
Schedule Performance Index (SPI)	Between 0.9 and 0.7 or between 1.1 and 1.2	Less than 0.7 or greater than 1.2
Cost Performance Index (CPI)	Between 0.9 and 0.7 or between 1.1 and 1.2	Less than 0.7 or greater than 1.2

Note. The Schedule and Cost Performance Indices will be used to measure the progress of the project based on the varying indicators associated with Earned Value Management.

4.2.12.2 Reporting Format. The project's cost performance will be presented and reviewed in the monthly status meeting and included in the monthly project status report. The Monthly Project Status Report will consist of a section dedicated to Cost Management and use the metrics identified in the earlier section.

4.2.12.3 Cost Variance Response Process. The project's Control Thresholds are set at a Cost Performance Index (CPI) or Schedule Performance Index (SPI) of less than 0.8 or greater than 1.2. Upon reaching any of these thresholds, a cost variance corrective action plan becomes mandatory.

Within seven business days of the initial cost variance report, the Project Manager will present the Project Sponsor with corrective action options. Once the Project Sponsor

selects a corrective action option, the Project Manager has five business days to show the Project Sponsor a formal Cost Variance Corrective Action Plan.

This plan will outline the necessary actions to realign the project within budget and detail the methods for measuring the effectiveness of the actions proposed. Upon acceptance of the Cost Variance Corrective Action Plan, it will be integrated into the project plan, and the project documentation will be updated accordingly to reflect the implemented corrective actions.

4.2.12.4 Cost Change Management Process. The cost change control process will follow the established project change request process. The project sponsor must approve the project budget/cost changes.

4.2.12.5 Project Activities Cost Estimates and Budget. The budget for this project is detailed in Figure 13 below. The costs are presented according to the activity estimates.

Figure 13

Project Budget and Cost Baseline

WBS ID	Activity Description	Cost	Work Package Estimate	Contingency Reserve	Total Estimated Cost	Management Reserve	Total Budget
1.1	Define Project Objectives	$ 100.00					
1.2	Identify Stakeholders	$ 100.00	$ 300.00	$ 30.00	$ 330.00		
1.3	Form Project Team	$ 100.00					
2.1.1	Conduct Stakeholder Interviews	$ 150.00					
2.1.2	Analyze 3 Existing Tools In Use	$ 300.00					
2.2.1	Conduct Stakeholder Interviews	$ 150.00	$ 900.00	$ 90.00	$ 990.00		
2.2.2	Define Future State Vision Statement	$ 100.00					
2.3.1	Define Preliminary Scope Requirements	$ 200.00					
3.1	Review Gaps identified between Current and Future State	$ 200.00					
3.2	Define Project Scope Requirements	$ 100.00	$ 800.00	$ 80.00	$ 880.00		
3.3	Determine Specific Deliverables, Timelines, and Resources	$ 500.00					
4.1	Map out Production Process Flow	$ 200.00					
4.2	Identify Operations-Critical Equipment	$ 200.00	$ 600.00	$ 60.00	$ 660.00		
4.3	Develop Base Schematics for Each System showing Equipment	$ 200.00					
5.1	Determine KPIs for Healthcare Status Determination	$ 100.00					
5.2	Define Metrics to Measure Healthcare Outcomes	$ 100.00	$ 500.00	$ 50.00	$ 550.00	$ 385.00	$ 8,085.00
5.3	Establish Baseline Data Collection Methods	$ 150.00					
5.4	Create Reporting Templates for Tracking Metrics	$ 150.00					
6.1	Design color-coded system interface	$ 100.00					
6.2	Develop color-coded layout with legend	$ 100.00	$ 600.00	$ 60.00	$ 660.00		
6.3	Implement color-coding scheme for data visualization	$ 250.00					
6.4	Conduct user testing and gather feedback for refinement	$ 150.00					
7.1	Integrate color-coded scheme with healthcare status and base schematics	$ 400.00					
7.2	Design interface to view threats details for each equipment	$ 400.00	$ 950.00	$ 95.00	$ 1,045.00		
7.3	Conduct user testing and gather feedback for refinement	$ 150.00					
8.1	Launch Vessel Eye BI Tool across the fleet	$ 400.00					
8.2	Integrate and automate input from relevant data sources	$ 500.00					
8.3	Customize dashboards and reports based on User Requirements	$ 200.00	$ 2,350.00	$ 235.00	$ 2,585.00		
8.4	Draft Technical Documentation	$ 500.00					
8.5	Conduct training sessions for end users	$ 750.00					
	TOTAL	**$ 7,000.00**	**$ 7,000.00**	**$ 700.00**	**$ 7,700.00**		

Note. The overall project budget is $8,085.00. This includes both contingency and management reserves. The work packages will be used as control accounts, and their associated cost are displayed in the cost baseline.

4.2.13 Schedule Management Plan

4.2.13.1 Purpose and Schedule Management Approach. The primary objective of the schedule management plan is to establish a comprehensive approach that the project team will employ to develop the project schedule. This plan also encompasses the team's approach to tracking the project schedule and administering changes once the baseline schedule has been approved. This includes identifying, analyzing, documenting, prioritizing, approving, rejecting, and publishing all schedule-related alterations.

To create project schedules, the team will leverage the Microsoft Project software, beginning with the deliverables identified in the project's Work Breakdown Structure (WBS). The activity definition process will identify the specific work packages that must be executed to complete each deliverable. The activity sequencing process will determine the order of work packages and assign relationships between project activities. Activity duration estimation will be employed to calculate the number of work periods needed to complete work packages. The resource estimating process will distribute resources to work packages to enable the successful completion of schedule development. As an addendum to this Schedule Management Plan, the Schedule Baseline is presented in Appendix 6. This schedule baseline details the project activities, duration estimates, and resource estimates.

4.2.13.2 Schedule Control. The project's schedule is subject to a bi-weekly review and update process, whereby task owners furnish the actual start, actual finish, and completion percentages, as required.

The project manager is accountable for conducting bi-weekly schedule updates and reviews, analyzing the impact of schedule variances, submitting schedule change requests, and reporting schedule status in line with the project's communications plan.

The project team is responsible for participating in bi-weekly schedule updates and reviews. They must promptly inform the project manager of any changes to actual start/finish dates and collaborate to resolve any schedule variances that may arise.

4.2.13.3 Schedule Changes and Thresholds. If a change to the project schedule becomes necessary, any member of the project team shall duly notify the project manager and team. A meeting shall be scheduled to review and thoroughly evaluate the proposed change, during which the project manager and team will determine which tasks shall be affected by the change, the variance as a result of the intended change, and any alternative or variance resolution activities that can be employed to assess the impact on the project's scope, schedule, and resources. If, after this evaluation, the project manager determines that the proposed change exceeds the established boundary conditions, then a schedule change request must be promptly submitted.

A schedule change request must be submitted to the Change Control Board for approval if the proposed change satisfies either of the following conditions:

- The proposed change is estimated to reduce or increase the duration of an individual work package by 20% or more.

- The proposed change is estimated to reduce or increase the duration of the overall baseline schedule by 20% or more.

4.2.13.4 Scope Change. The project team must evaluate any approved changes to the project scope to decide their potential impact on the current project schedule. Suppose the project manager decides that the scope change will substantially affect the existing project schedule. In that case, they may request a re-baselining of the schedule to incorporate any necessary adjustments related to the new project scope. Any change requests will be handled following the project's Change Management Plan, ensuring smooth and efficient management of the project's evolution.

4.2.14 Quality Management Plan

4.2.14.1 Purpose and Quality Management Approach. The Quality Management Plan is designed to ensure our project delivers a high-quality product by establishing a comprehensive set of activities, processes, and procedures. This plan details how quality will be managed, outlines both quality assurance and quality control activities, and defines acceptable quality standards. Our goal is to plan for quality, manage it effectively, and ensure all stakeholders are aware of the quality standards and expectations.

To achieve this, we will employ an integrated quality management approach that encompasses both the product and the processes involved in its creation. This approach includes defining quality standards, measuring quality, and continually improving to meet project objectives.

For the product, quality will be guided by our company's established standards for business intelligence tools, focusing on end-user satisfaction. These standards and criteria will ensure that the deliverable meets the required quality levels.

Regarding process quality, we will emphasize adherence to COGL's organizational standards. By establishing and adhering to quality standards for our processes, we will ensure all activities align with our organization's expectations, leading to the successful delivery of the product.

4.2.14.2 Quality Requirements and Standards. The project's quality requirements and standards will align with the company's existing benchmarks for business intelligence tools. These standards cover various aspects of the project to ensure a comprehensive approach to quality. Specifically, the requirements and standards include:

- **Data Accuracy:** Ensuring all data processed and presented by the business intelligence tools is accurate and reliable. This involves stringent data validation processes and regular audits to maintain data integrity.
- **Data Reliability:** Ensuring the system's ability to consistently perform its intended functions without failures. This includes robust error handling, data redundancy, and regular system maintenance checks to prevent data loss or corruption.
- **User Interface Design:** Focusing on creating an intuitive, user-friendly interface that enhances user experience. This includes adherence to design principles such as simplicity, consistency, and responsiveness, as well as thorough usability testing.

- **Performance:** Ensuring the system meets performance benchmarks, including fast load times, efficient data processing, and scalability to handle increasing amounts of data and users without degradation in performance.
- **Security:** Implementing comprehensive security measures to protect data from unauthorized access, breaches, and other security threats. This includes data encryption, secure user authentication, and regular security audits and updates to comply with the latest security standards.
- **Compliance with Regulations:** Ensuring the system adheres to all relevant legal and regulatory requirements, such as data protection laws (e.g., GDPR), industry standards, and company policies. This involves continuous monitoring and updating of compliance measures as regulations evolve.
- **Industry Best Practices:** Aligning with industry best practices for software development and business intelligence, including agile methodologies, continuous integration, and continuous delivery practices. This ensures the project not only meets current standards but is also adaptable to future advancements and changes in the industry.
- **Documentation and Training:** Providing comprehensive documentation and training materials to ensure users and stakeholders can effectively use and support the system. This includes user manuals, technical documentation, and training sessions or resources.

By adhering to these detailed quality requirements and standards, the project aims to deliver a product that not only meets but exceeds the expectations of our stakeholders and

end-users. These standards are found within the organization’s Global Enterprise Management System (GEMS) under the Project – Execute - Quality Procedures.

4.2.14.3 Quality Assurance and Controls. Quality assurance activities will be proactively implemented throughout the project lifecycle to uphold predefined quality standards and mitigate risks. The project team will proactively approach quality assurance throughout the project's iterative cycles. It will include collaborative quality planning during sprint planning sessions, regular retrospectives to reflect on and refine processes, ongoing peer reviews of user stories and code, and fostering a culture of continuous improvement through adaptive team training and skill enhancement initiatives.

Quality control measures will be employed to monitor and verify that project deliverables meet the specified quality requirements. Quality control activities are integrated seamlessly into the agile workflow, emphasizing frequent inspection and adaptation. This includes conducting automated and manual testing within each sprint to confirm user stories and features, leveraging tools for continuous integration and deployment to detect defects early, tracking key quality metrics such as velocity and burndown charts to monitor project health, and incorporating user feedback through regular sprint reviews to ensure alignment with stakeholder expectations.

Table 10

Project Quality Assurance and Control Activities

Activity	Description	Activity Type	Owner
Collaborative Quality Planning	Conducted during sprint planning sessions to set quality goals.	Assurance	Product Owner
Regular Retrospectives	Held to reflect on and refine processes.	Assurance	Product Owner
Ongoing Peer Reviews	Focused on user stories and code to ensure adherence to quality standards.	Assurance	Product Owner
Continuous Improvement	Encouraged through adaptive team training and skill enhancement initiatives.	Assurance	Project Manager
Automated and Manual Testing	Conducted within each sprint to validate user stories and features.	Control	Product Owner
Continuous Integration and Deployment Tools	Utilized to detect defects early.	Control	Product Owner
Tracking of Quality Metrics	Includes velocity and burndown charts to monitor project health.	Control	Project Manager
User Feedback	Collected through regular sprint reviews to ensure alignment with stakeholder expectations.	Control	Product Owner

Note. The activities outlined will be carried out continuously throughout the project as the team aims to deliver a product that not only meets but exceeds the quality expectations of our stakeholders. Activities outside of the items above will be executed external to the project by the Quality and Regulatory Management Department.

4.2.15 Resources and Procurement Management Plan

4.2.15.1 Purpose of the Plan. The Procurement Management Plan outlines the project's procurement requirements and how it will be managed, from creating procurement documentation to finalizing contracts. It will specify the approach that will be used to manage procurement, define procurement details for this project, identify the types of contracts that will be utilized, assess the risks involved, determine the cost, and specify which procurement documents will be used.

The success of a project heavily relies on the resources allocated to it. A Resources Management Plan is implemented to manage human resources activities throughout the project lifecycle. The primary goal of this plan is to ensure that adequate human resources are acquired and that they possess the necessary skills. In case of any skill gaps, the resources are trained accordingly. The plan also defines team-building strategies and ensures that team activities are effectively managed.

4.2.15.2 Resources and Procurement Management Approach. The Project Manager will play a crucial role in ensuring the success of this project by providing oversight and management for all procurement activities. This includes hiring an external consultant, who will be managed based on a time and materials contract. The Project Manager will ensure that this procurement activity is carried out smoothly, efficiently, and within budget.

In terms of human resources for the project, the Vendor Management section will supply detailed information on the different functional departments from which staff will be

drawn. The Project Manager will work closely with the Vendor Management team to ensure that the right personnel are assigned to the project and can work effectively together. This includes coordinating and managing the work of the external consultant and overseeing the work of all internal personnel involved in the project.

Overall, the Project Manager will be a crucial player in ensuring that the project is completed on time, within budget, and to the satisfaction of all stakeholders.

4.2.15.3 Procurement Definition. Procurement for the Vessel Eye BI Tool Project will involve acquiring the services of an external BI/Tech consultant. This procurement activity will aim to supplement internal expertise and ensure the successful implementation of the BI tool.

4.2.15.4 Type of Contracts. The type of contract to be used for procuring the services of the external BI/Tech consultant will be a Time and Material (T&M) contract. This contract type allows for flexibility in scope and duration, enabling adjustments based on project needs and progress.

4.2.15.5 Procurement Risks. The following risks related to procurement were identified:

- **Dependency Risk –** Dependency on the external consultant may introduce risks related to their availability, expertise, and alignment with project goals.
- **Budget Overrun Risk** – The project cost may increase if the budget for external consultancy services exceeds the allocated amount.

4.2.15.6 Cost Determination and Procurement Documents. The external consultant's cost will be determined based on hourly rates and the estimated project

duration. Procurement documents will include a Request for Proposal (RFP) outlining project requirements, scope of work, evaluation criteria, and contractual terms.

4.2.15.7 Contract Approval Process and Decision Criteria. The contract approval process will involve evaluating proposals received from potential consultants based on criteria such as technical expertise, experience, proposed approach, and cost. The project sponsor and procurement authority will approve the final contract based on its alignment with project objectives and the available budget.

4.2.15.8 Vendor Management. Vendor management will involve regular communication, performance monitoring, and issue resolution with the external BI/Tech consultant. Clear expectations, deliverables, and timelines will be established, and periodic progress reviews will be conducted to ensure alignment with project goals. This will be done in line with the project's Communications Management Plan.

4.2.15.9 Staffing Management. Internal staffing management will be critical for ensuring efficient resource allocation, skill enhancement, and workload distribution among full-time employees engaged in multiple projects. In collaboration with functional and department managers, the Project Manager will negotiate resource assignments aligning with the project's organizational structure. Before the commencement of any project tasks, all resource allocations must receive approval from the relevant functional or departmental manager.

Given the project team's dispersed nature, with members working from their respective workspaces, a clear delineation of roles, responsibilities, and reporting lines will be established to enhance team cohesion and productivity. Any proposed alterations to

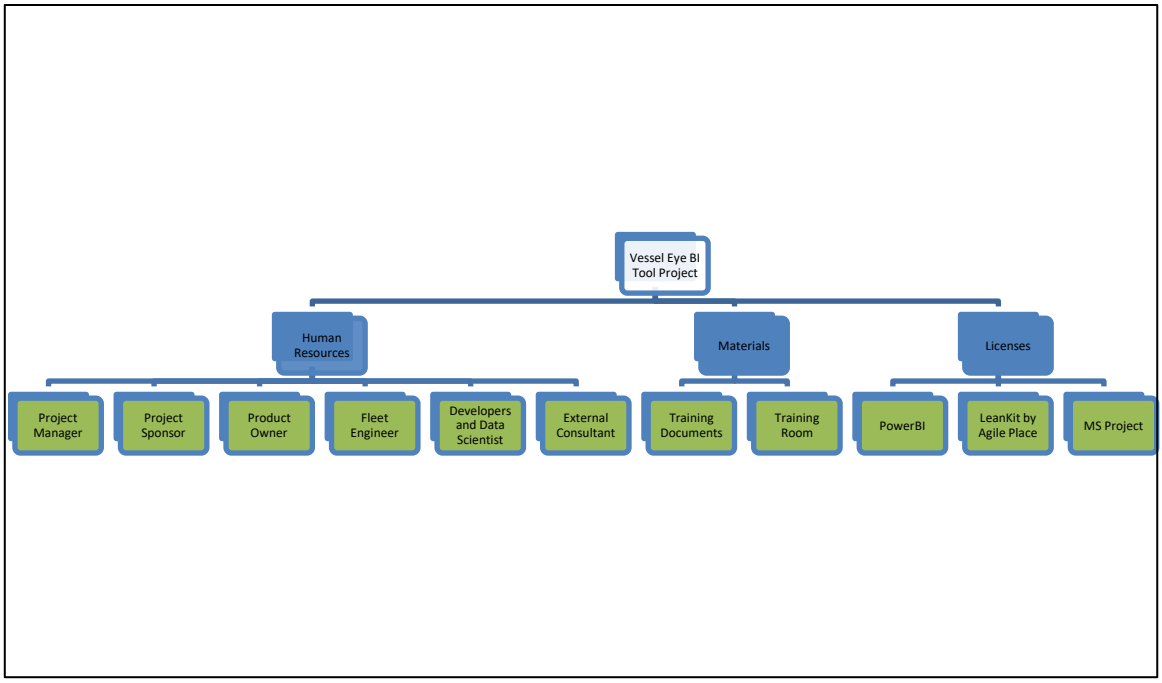
project roles will undergo review and endorsement by the Project Manager, adhering to the project's change control process. All project documentation will be promptly revised and disseminated as adjustments are implemented.

Routine performance evaluations and feedback sessions will be conducted to foster continuous improvement and project efficacy. At project initiation, the Project Manager will outline work expectations for each team member. Throughout the project lifecycle, ongoing assessments will gauge individual performance and task completion efficiency. Before resource disengagement, the Project Manager will meet with the pertinent functional manager to provide feedback on each team member's project performance. Subsequently, formal performance reviews conducted by functional managers will factor into the Annual Performance Review Cycle, influencing bonus allocations and salary adjustments.

4.2.15.10 Resource Breakdown Structure. The Resource Breakdown Structure (RBS) shows the organization and categories of resources needed to complete the project. Figure 14 displays the resource breakdown structure for this project. This RBS is supplemented by the WBS Dictionary displayed in Figure 10 that shows the cost and duration estimates for these resources against the activities list.

Figure 14

Resource Breakdown Structure of the Project



Note. The Resource Breakdown Structure highlights three distinct categories of resources: Human Resources, Materials, and Licenses. The project is being executed internally with limited use of external resources.

4.2.15.11 Responsibility, Accountability, Consulted, and Informed Matrix

A RACI (Responsible, Accountable, Consulted, Informed) Matrix was developed for the project to clearly define and communicate roles and responsibilities, thereby minimizing confusion and enhancing overall communication effectiveness. The project's RACI matrix is presented in Table 10.

Table 11

Project RACI Matrix

WBS Code	Deliverable	Project Manager	Product Owner	Fleet Engineer	Developers and Data Scientist	External Consultant	Project Sponsor	End-users
1	Project Initiation	A	C	I	I	I	I	I
1.1	Define Project Objectives	A	R	I	I	C	R	I
1.2	Identify Stakeholders	R	C	I	I	I	C	I
1.3	Form Project Team	A	R	I	I	I	C	I
2	Current State and Future State Vision Assessment	A	C	R	C	C	I	I
2.1	Conduct stakeholder interviews	A	R	I	I	C	I	C
2.2	Analyze 3 existing tools in use	A	C	R	R	C	I	I
2.3	Develop preliminary budget	A	C	I	I	C	R	I
2.4	Conduct stakeholder interviews	A	R	I	I	C	I	C
2.5	Define Future State Vision	A	R	C	I	C	C	I
2.6	Define preliminary scope requirements	A	R	C	C	C	I	I
3	Project Scope Definition	A	R	C	C	C	I	I
3.1	Review gaps identified between Current and Future State	A	R	C	C	C	I	I
3.2	Define project scope requirements	A	R	C	C	C	I	I
3.3	Determine specific deliverables, timelines, and resources	A	R	C	C	C	I	I
4	Production Process Flow Illustration and Equipment Identification	A	C	R	R	I	I	I
4.1	Map out production process flow	C	A	R	R	C	I	I
4.2	Identify operations critical equipment	C	A	R	I	C	I	I
4.3	Develop base schematics for each system showing equipment	C	A	R	R	C	I	I
5	Metrics Definition for Healthcare Status	C	A	R	R	C	I	I
5.1	Determine KPIs for healthcare status determination	C	A	R	C	C	I	I
5.2	Define metrics to measure healthcare outcomes	C	A	R	C	C	I	I
5.3	Establish baseline data collection methods	A	C	C	R	C	I	I
5.4	Create reporting templates for tracking metrics	C	A	C	R	C	I	I
6	Color-coded System Development	C	A	C	R	C	I	C
6.1	Design color-coded system interface	C	R	C	R	C	I	C
6.2	Develop color-coded layout with legend	C	A	C	R	C	I	C

WBS Code	Deliverable	Project Manager	Product Owner	Fleet Engineer	Developers and Data Scientist	External Consultant	Project Sponsor	End-users
6.3	Implement color-coding scheme for data visualization	C	A	C	R	C	I	C
6.4	Conduct user testing and gather feedback for refinement	I	A	I	R	C	I	R
7	Development of Graphical Representation of Threats	C	A	C	R	C	I	C
7.1	Integrate color-coded scheme with healthcare status and base schematics	C	A	C	R	C	I	C
7.2	Design interface to view threats details for each equipment	C	A	C	R	C	I	C
7.3	Conduct user testing and gather feedback for refinement	C	A	I	R	I	I	R
8	Deployment and integration of Vessel Eye	C	A	R	R	C	I	I
8.1	Launch Vessel Eye BI Tool across the fleet	C	A	R	R	C	I	I
8.2	Integrate and automate input from relevant data sources	C	A	C	R	C	I	I
8.3	Customize dashboards and reports based on User Requirements	C	A	C	R	C	I	R
8.4	Draft technical documentation and training material	A	C	R	R	I	I	C
8.5	Conduct training sessions for end users	A	C	R	R	I	I	R

Note. In the RACI matrix, the term "Responsible" refers to those who perform the task or activity, ensuring the work is completed. "Accountable" designates the individual who is ultimately responsible for the task's successful completion. "Consulted" includes those individuals or groups whose input and feedback are sought during the task. Lastly, "Informed" pertains to the individuals or groups who need to be kept updated about the progress and outcomes of the task.

4.2.16 Risk Management Plan

The risk management plan aims to establish the framework for the project team to identify risks and develop strategies to mitigate or avoid those risks. However, preliminary

project elements must be completed before risks can be identified and managed, as outlined in the risk management approach.

The project will use the risk categories related to scope, schedule, cost, quality, resource, communication, and external risks. To effectively manage these risks, a proactive approach will be adopted. This involves conducting thorough risk assessments at various project stages, identifying potential threats and opportunities, and developing risk mitigation and contingency plans. To promptly address emerging risks, continuous monitoring and communication among project stakeholders will be crucial. The goal is to minimize negative impacts on project goals, enhance opportunities, and ensure the successful delivery of the Vessel Eye BI Tool Project.

4.2.16.1 Major Project Risks. The following significant risks were identified for this project:

- **Inaccurate or incomplete information:** If the data used as input for the Business Intelligence (BI) tool is flawed or lacking in quality, it can lead to false insights and flawed decision-making. For instance, if crucial data points are missing or if there are errors in data collection or processing, the conclusions drawn from the BI tool may be misleading, potentially resulting in poor strategic decisions.
- **Technical challenges in integration:** Integrating the BI tool with existing systems and databases in the Floating Production Storage and Offloading (FPSO) environment can be complex. Technical challenges such as data format mismatches, connectivity issues, or compatibility problems between different software systems

could arise. These challenges might lead to delays or disruptions in the project timeline, impacting overall efficiency and productivity.

- **Resistance to change and inadequate training:** End-users may resist adopting the BI tool due to a reluctance to change established workflows or a lack of understanding of its benefits. Additionally, suppose end-users are not adequately trained on how to use the BI tool effectively. In that case, they may not fully use its capabilities, diminishing its value in supporting decision-making processes. Overcoming resistance to change and providing comprehensive training is essential for ensuring the successful adoption and use of the BI tool.
- **Security and confidentiality concerns:** Since BI tools deal with sensitive data, ensuring the security and confidentiality of this information is paramount. Failure to implement robust security measures could result in unauthorized access, data breaches, or leakage of sensitive information. This not only poses a risk to the organization's reputation but also exposes it to legal and regulatory consequences.
- **Dependency on third-party technologies:** Many BI tools rely on third-party technologies or software components to function correctly. Depending on external vendors introduces the risk of compatibility issues, especially if updates or changes to these third-party technologies are not seamlessly integrated with the BI tool. A failure to address compatibility issues could lead to system failures, data loss, or functional limitations.
- **Compliance with industry regulations:** The FPSO industry is subject to various laws and compliance standards concerning data privacy, security, and operational

practices. Not adhering to these regulations can result in penalties, legal liabilities, and reputational damage. Managing compliance risks throughout the project lifecycle involves implementing robust processes and controls to ensure that data handling practices align with regulatory requirements and industry best practices.

4.2.16.2 Risk Management Approach. The project schedule incorporates the most probable and impactful risks to ensure the prompt implementation of mitigation measures. These risks will be updated during bi-weekly project team meetings, aligning with their scheduled timeframe. Risks will be continuously identified, monitored, and addressed throughout the project lifecycle. Upon project completion, the project manager will assess each risk and the overall risk management approach. Based on this assessment, the project manager will identify areas for improvement in the risk management process for future projects, documenting these enhancements as part of the lessons learned repository.

4.2.16.3 Risk Identification. The project team employed several risk identification techniques to ensure a comprehensive understanding of potential risks throughout the project lifecycle. The team conducted brainstorming sessions involving key stakeholders from various departments to generate a wide range of possible risks related to implementing and operating the BI tool. These sessions encouraged open discussion and collaboration, enabling the team to capture diverse perspectives and insights.

Additionally, the team used documentation review as a technique to identify risks. This involved examining project plans, technical specifications, and other relevant documentation to identify potential sources of risk, such as technical dependencies, regulatory requirements, and integration challenges with existing systems. By

systematically reviewing project documentation, the team uncovered hidden risks that may not have been clear during the initial planning stages.

Lastly, the team used expert judgment by consulting with individuals with specialized knowledge or experience relevant to the project domain. This included BI tool experts, IT professionals, and industry experts familiar with the FPSO environment. Engaging with experts allowed the team to benefit from their insights and expertise, helping find risks unique to the project context or industry sector.

4.2.16.4 Risk Prioritization (Probability and Impact). A probability and impact factor were assigned to each risk to determine the severity of the risks identified by the team. This process allowed the project manager to prioritize risks based on their effect on the project. The project manager used a probability-impact matrix to help the team determine the severity of the risk. Figure 15 highlights the probability-impact matrix used during the prioritization session, and the final priorities are reflected in the Risk Register.

Figure 15

Probability-Impact Scale

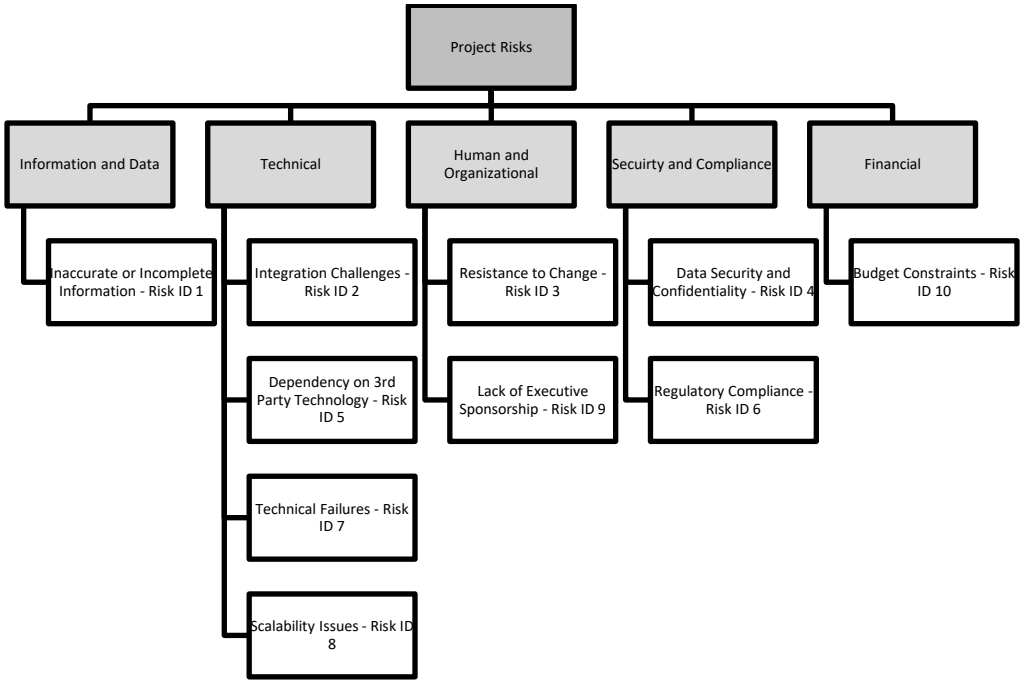
		Impact				
		Trivial	Minor	Moderate	Major	Extreme
Probability	Rare	Low	Low	Low	Medium	Medium
	Unlikely	Low	Low	Medium	Medium	Medium
	Moderate	Low	Medium	Medium	Medium	High
	Likely	Medium	Medium	Medium	High	High
	Very likely	Medium	Medium	High	High	High

Note. Arumugam, M (2012) Just Get PMP. Probability and Impact Matrix From https://www.justgetpmp.com/2012/02/probability-and-impact-matrix.html

4.2.16.5 Risk Breakdown Structure. The Risk Breakdown Structure (RBS) was designed to organize potential project risks into categories, facilitating better identification, analysis, and management. It enhances clarity, allows for the prioritization of risk responses, and will improve overall project risk management efficiency. Figure 16 shows the Risk Breakdown Structure for this project.

Figure 16

Project Risk Breakdown Structure



Note. The major risk categories were identified, and each of the related risks in the Risk Register are decomposed in those categories.

4.2.16.6 Risk Register. The Risk Register for this project is a comprehensive log detailing all identified risks, their probability, impact on the project, category, mitigation strategy, and anticipated occurrence. Initiated during the first project risk management meeting, led by the project manager, the register was meticulously compiled as the project team collectively identified and categorized each risk. Furthermore, each risk was evaluated, receiving a score based on its likelihood and potential impact. The Risk Register

also encompasses mitigation strategies and timelines for each identified risk, which will be upheld as an embedded table in this Risk Management Plan.

Under the guidance of the project manager, the project team has developed responses to each identified risk. As new risks appear, they will be assessed and qualified, with the team devising avoidance and mitigation strategies accordingly. These newly identified risks will be integrated into the Risk Register and the Project Plan to ensure diligent monitoring and prompt responses. The Risk Management Plan will undergo updates to accommodate evolving circumstances if necessary.

Risk management for this project adheres to time, scope, and cost constraints. All identified risks will undergo an evaluation to ascertain their impact on this triple constraint. In collaboration with the project team, the project manager will determine the most effective responses to ensure compliance within these constraints.

Flexibility within one of the project's constraints may be warranted in exceptional circumstances. Only the cost constraint allows for flexibility as a last resort. In such instances, additional funding may be allocated to bolster resources and meet the demands of time and scope. Time and scope remain inflexible, with no room for adjustment. Again, the cost constraint maintains flexibility in extreme scenarios where alternative risk avoidance or mitigation strategies prove ineffective.

Table 12 displays the Risk Register for the Vessel Eye BI Tool Project and outlines the significant risks identified.

Table 12

Vessel Eye BI Tool Project Risk Register

Risk ID	Risk Description	Impact	Probability	Severity	Owner	Mitigating Action	Contingency Plan	Progress on Action	Resources
1	Inaccurate or incomplete information being used as input may lead to flawed insights and incorrect decision-making.	Major	Likely	High	Data Scientists	Define the scope of the inputs and ensure reliable data is being used as input.	Assumptions and constraints are defined in the project documents. Removal of high-risk items	Consulting with an expert to help define reliable data sources with the data scientist early in the project	Assumptions Log
2	Integrating the BI tool with existing systems and databases within the FPSO environment could pose technical challenges, potentially resulting in delays or disruptions in the project timeline.	Major	Very Likely	High	Product Owner	Conduct thorough compatibility assessments and pilot testing before full-scale implementation.	Allocate additional time and resources for troubleshooting and integration if delays occur.	Engage with IT support or external consultants with expertise in FPSO environments for assistance.	Project Schedule

Risk ID	Risk Description	Impact	Probability	Severity	Owner	Mitigating Action	Contingency Plan	Progress on Action	Resources
3	Resistance to change or inadequate training among end-users may hinder the effective utilization of the BI tool or impact its overall effectiveness in supporting the decision-making process.	Moderate	Very Likely	Medium	Project Manager	Develop comprehensive training programs and user support resources. Implement change management strategies to address resistance.	Provide ongoing support and training resources. Offer incentives for adoption and proficiency.	Regularly assess user feedback and address concerns promptly. Adjust training and support strategies as needed.	Communications Plan, Change Management Plan
4	Ensuring the security and confidentiality of sensitive data stored and processed by the BI tool is crucial to prevent unauthorized access or data breaches.	Major	Very Likely	High	Data Scientists	Implement robust encryption protocols and access controls. Regularly audit system security.	Develop response protocols for potential security breaches. Ensure compliance with relevant data protection regulations.	Continuously monitor security measures and update as needed. Conduct periodic security audits and assessments.	Quality Management Plan

Risk ID	Risk Description	Impact	Probability	Severity	Owner	Mitigating Action	Contingency Plan	Progress on Action	Resources
5	Dependency on third-party technologies or software components for the BI Tool's functionality may expose the project to risks related to compatibility issues.	Moderate	Likely	Medium	Project Manager	Thoroughly vet third-party solutions for compatibility and reliability. Establish backup plans for critical functionalities.	Identify alternative solutions or workarounds in case of compatibility issues. Engage with vendors for timely support and resolution.	Regularly monitor third-party dependencies and maintain open communication with vendors.	Project Schedule
6	Adhering to industry regulations and compliance standards regarding data privacy, security, and operational practices presents a potential risk that must be managed throughout the project lifecycle.	Major	Very Likely	High	Sponsor	Conduct comprehensive compliance assessments. Implement robust data privacy and security measures.	Establish clear policies and procedures for compliance monitoring and enforcement. Engage legal counsel for guidance on regulatory requirements.	Regularly review and update compliance measures to align with evolving regulations. Conduct periodic audits to ensure adherence.	Project Schedule

Risk ID	Risk Description	Impact	Probability	Severity	Owner	Mitigating Action	Contingency Plan	Progress on Action	Resources
7	Technical failures or glitches in the BI tool's software or hardware infrastructure could result in downtime, data loss, or reduced performance.	Major	Likely	High	Data Scientists	Implement redundant systems and backup procedures. Regularly update and maintain software and hardware components.	Develop rapid response protocols for technical issues. Coordinate with IT support for timely resolution.	Conduct regular system audits and performance tests. Monitor system health and address issues promptly.	Quality Management Plan
8	Insufficient scalability of the BI tool to handle increasing data volumes or user demands may lead to performance degradation or system overload.	Major	Likely	High	Product Owner	Design the BI tool with scalability in mind, utilizing scalable architectures and technologies. Monitor system performance and resource utilization.	Develop scalability plans and upgrade strategies. Allocate resources for hardware upgrades or cloud services as needed.	Conduct regular capacity planning assessments. Scale infrastructure proactively to accommodate growth.	Scope Management Plan, Assumptions Log

Risk ID	Risk Description	Impact	Probability	Severity	Owner	Mitigating Action	Contingency Plan	Progress on Action	Resources
9	Lack of executive sponsorship or stakeholder engagement may result in inadequate support or resources allocated to the BI tool project, impeding its success.	Major	Likely	High	Project Sponsor	Secure executive buy-in and support early in the project. Clearly communicate the benefits and strategic importance of the BI tool.	Develop stakeholder engagement strategies. Address concerns and provide regular updates to stakeholders.	Maintain ongoing communication with executives and stakeholders. Align project goals with organizational objectives.	Stakeholder Engagement Plan
10	Budget constraints or financial limitations may restrict the scope or quality of the BI tool project deliverables, impacting its effectiveness and value.	Major	Likely	High	Project Manager	Conduct thorough budget planning and cost estimation. Identify cost-saving measures and prioritize essential project components.	Develop contingency plans for budget overruns or unforeseen expenses. Seek approval for additional funding if necessary.	Monitor project expenses closely. Implement cost control measures and adjust the budget as needed.	Cost Management Plan

Note. The risk register will be continuously monitored and updated throughout the project lifecycle. All risks identified will be assessed and updated in the register.

4.2.17 Communications Management Plan

The core objectives of the Communications Management Plan will be information dissemination and information assimilation between all stakeholders involved in the Vessel Eye BI Tool Project. It will allow for the efficient and effective management of the expectations of our stakeholders as they relate to the project activities, their progress and execution, and reporting on project quality. The plan will define all stakeholders through identification and classification, both internal and external, according to interest and influence and outline a suitable strategy to facilitate the core objectives.

The scope of the Communication Management Plan is to provide the framework for engaging and communicating with stakeholders during the project lifecycle. It is not prescriptive. However, it does highlight the range of tools and techniques that must be employed. The plan will be responsive as the project progresses and tailored to the needs of different situations and stakeholders, as well as in response to feedback from those stakeholders. The activities include:

- Identifying and classifying the stakeholders, and
- Establishing the process to communicate with each stakeholder, including the distribution, communication channel, and frequency of communication.

The Project Manager will take a proactive role in ensuring effective communication on this project. The communications requirements are documented in the Communications Matrix presented in this document. The Communications Matrix will be used as the guide

for what information to communicate, who is to communicate it, when to communicate it, and to whom to communicate.

4.2.17.1 Stakeholders, Communication Methods, and Technology. The project team will determine, by COGL's organizational policy, the communication methods and technologies based on several factors, including stakeholder communication requirements, available technologies (internal and external), and organizational policies and standards.

The key stakeholders are identified in Table 6, which also describes their specific requirements for this project. In keeping with those requirements, Table 13 provides the detailed Communications Matrix for the Vessel Eye BI Tool Project. The primary channels of communication are outlined and when they are most applicable.

Table 13

Project Communications Matrix

Communication Type	Audience	Description/Purpose	Frequency	Owner	Channel
Kick-off Meeting	Project Sponsor, Project Manager, Product Owner, Scrum Master, Developers and Data Scientists, Business Analyst/Fleet Engineer, Operation Managers, System Engineers, Offshore Installation Manager, Offshore Supervisor, Onshore Support Engineers	Official launch of the project, setting expectations, defining goals and roles	One-time occurrence	Project Manager	Video Conference, In-person Meeting
Project Team Meetings	Project Manager, Scrum Master, Developers and Data Scientists, Business Analyst/Fleet Engineer, System Engineers, Offshore Installation Manager, Onshore Support Engineers	Collaborative discussions, progress updates, issue resolution	Weekly	Project Manager	Video Conference
Technical Design Meetings	Developers and Data Scientists, System Engineers, Offshore Installation Managers, Onshore Support Engineers	Detailed discussions on technical architecture, requirements, and solutions	As needed	Technical Lead	Video Conference, Working Meetings
Monthly Project Status Meetings	Project Sponsor, Project Manager, Product Owner, Scrum Master, Business Analyst/Fleet Engineer, Operation Managers	Comprehensive review of project progress, milestones, risks, and issues	Monthly	Project Manager	Video Conference, Working Meetings
Project Status Report	Project Sponsor, Project Manager, Product Owner, Business Analyst/Fleet Engineer, Operation Managers	Summarizes project progress, accomplishments, risks, and upcoming milestones	Monthly	Project Manager	Email

Communication Type	Audience	Description/Purpose	Frequency	Owner	Channel
Personal Communication	Individual Team Members (Developers and Data Scientists, Business Analyst/Fleet Engineer, System Engineers, Offshore Installation Manager, Onshore Support Engineers)	One-on-one discussions, feedback, support	As needed	Respective Managers	Email/Chat/In-person

Note. The project has several communication methods that may be used, formally or informally. Changes outside of this matrix must be approved by the project manager and must be in line with the organization's communications policies.

4.2.17.2 Meetings and Video Conferencing Guidelines. All meetings and video conferences must follow the guidelines stipulated in this section and the communications standards detailed in the next section.

- **Meeting Agenda**

Meeting Agenda will be distributed three business days in advance of the meeting. The agenda should identify the owner of each agenda item along with a time limit. The first item on the agenda should be a review of action items from the previous meeting.

- **Meeting Minutes**

Meeting minutes shall be distributed within two business days following the meeting. Meeting minutes will include the status of all items from the agenda, along with any new action items raised during the meeting.

- **Action Items**

The action items coming out of the meeting shall be recorded both in the preceding meeting agenda and meeting minutes. Action items should include both the action owner and action description. Meetings will start with a review of the status of all action items from previous meetings and end with a review of all new action items resulting from the meeting.

4.2.17.3 Communication Standards. By using standardization, organizations can help ensure that their project teams and stakeholders have a thorough understanding of what is expected and achieve consistent and effective communications. The Vessel Eye BI

Tool Project will use standard organizational formats and templates for all formal project communications within the confines of COGL's Communications Policy.

Formal project communications are detailed in the project's communication matrix and the project team will utilize COGL's standard templates for meeting agendas and meeting minutes. Additionally, any slides presented will use COGL's most recent standard slideshow template. This applies to the kick-off meeting, project team meetings, technical design meetings, monthly project status meetings, and all project status reports.

Informal project communications should be professional and effective, but there is no standard template or format that must be used.

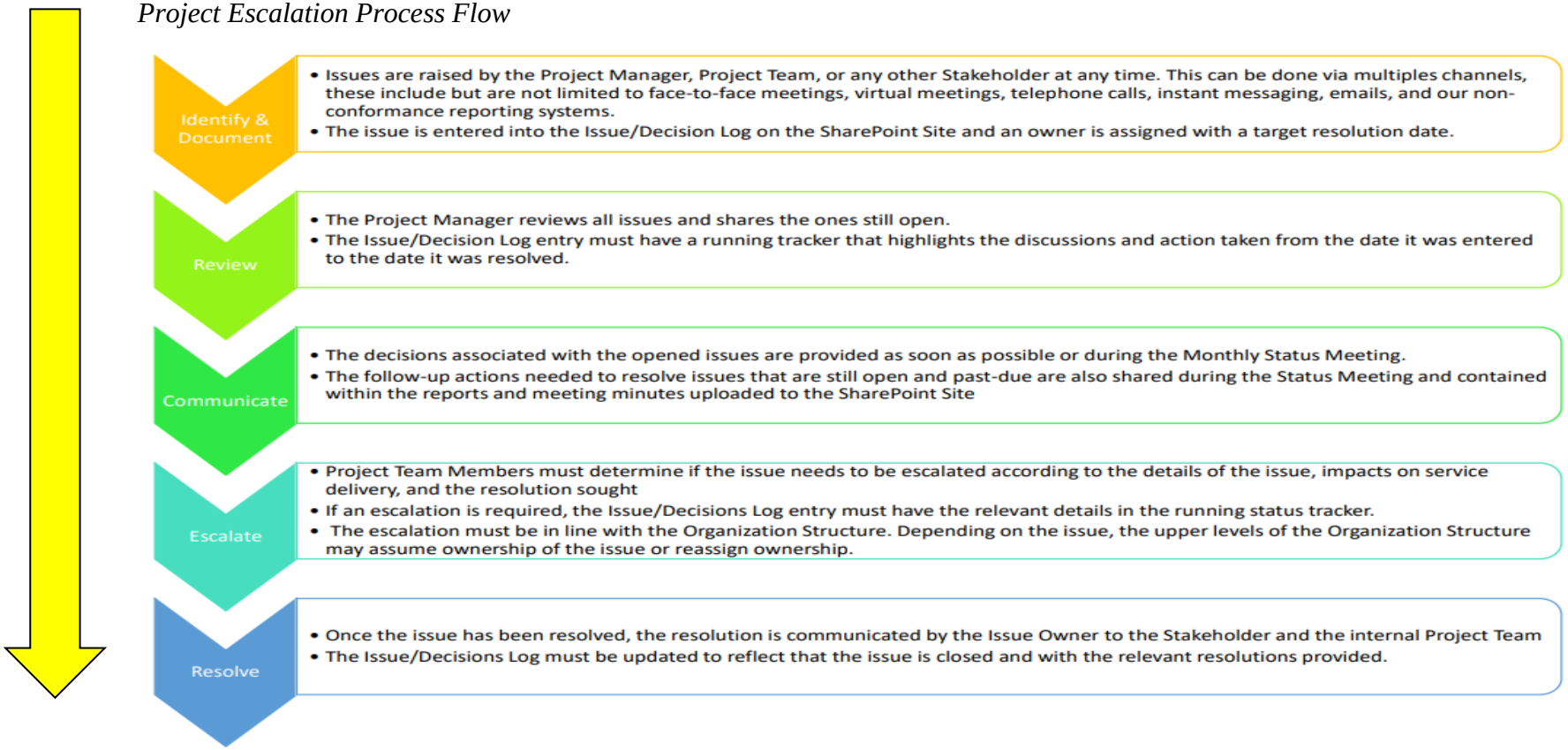
4.2.17.4 Escalation Process. Any issues, including but not limited to disputes, conflicts, or discrepancies regarding project communications, must be resolved in a way that is conducive to maintaining the project schedule, ensuring the correct communications are distributed, and preventing any ongoing difficulties.

An issue is any queries, debates, problems, complaints, and feedback that adversely affect the project's outcome. They can be initiated by any of the stakeholders and should be resolved at the lowest possible level of the hierarchical structure of the project. If the issue cannot be resolved at a particular level, then it must be escalated for prompt and efficient resolution following the hierarchical levels. If a further escalation is needed beyond the current structure, the proper process must be provided by the Project Manager to the stakeholder.

The following flowchart summarizes the steps in the process to manage issues:

Figure 17

Project Escalation Process Flow



Note. The formal escalation process flow must be used when issues are raised and documented in the issues log.

4.2.18 Project Close-Out Plan

The purpose of this Project Close-Out Plan is to ensure a smooth transition of the Vessel Eye BI Tool project deliverables to operational status and to formally conclude the project. This plan outlines the steps and activities needed to confirm that the project has met all objectives, satisfied all strategic goals, completed the full scope of work, and secured formal acceptance from the end-users and sponsor. The project follows a hybrid execution model, combining agile and traditional methodologies.

4.2.18.1 Transition to Operations. To ensure a seamless transition of the Vessel Eye BI Tool to operational status, we will focus on comprehensive training and thorough documentation. The Fleet Engineer will be responsible for organizing and conducting detailed training sessions for all end-users. These sessions will cover all aspects of the tool, ensuring that every user is comfortable and capable of using its features. Alongside the training, extensive user manuals and documentation will be provided to serve as ongoing references. Additionally, the Developers will compile and distribute all necessary tools and documentation needed for the effective operation and maintenance of the BI Tool. This includes user guides, maintenance manuals, and support contacts. All project-related documents will be added to the central repository system for the PMO.

4.2.18.2 Achievement of Strategic Goals. To confirm that the project has achieved its strategic goals, the Product Owner will review the initial objectives and goals set at the project's inception and detailed in the Requirements Traceability Matrix. A performance analysis will be conducted to compare the project's outcomes against these goals, documenting any variances and their implications. This process will culminate in a

comprehensive report summarizing the extent to which the project has satisfied its strategic objectives. This report will provide a clear picture of the project's success and highlight areas for potential improvement in future projects.

4.2.18.3 Scope Completion and Acceptance. Ensuring the entire scope of the project has been completed is critical for project closure. The Project Manager will conduct a final review of the project scope against the project plan, verifying the completion of all deliverables and tasks. The Project Manager will also review the report prepared by the Product Owner, summarizing the extent to which the objectives have been met. Evidence of completed work, such as test results, user feedback, and inspection reports, will be gathered to support this verification. Following this, the Project Manager will prepare a formal acceptance document detailing all completed deliverables. A final review meeting will be scheduled with the end-users and sponsor to present this document for review and sign-off, securing formal documented acceptance which will be kept for project records.

4.2.18.4 Contract and Resource Management. Managing contracts and resources efficiently is crucial for the successful close-out of the project. Since the project involves one external consultant, the Project Manager will ensure that all contractual obligations with this consultant are fulfilled. This includes verifying that the consultant has delivered all agreed-upon products and services and that all payments have been made. The Project Manager will also obtain any supplementary deliverables from the consultant.

For the internal staff, who will support the project while remaining in their current functions, additional tasks related to the project will be temporarily assigned to them. These tasks are necessary to complete the project work but will not be part of their ongoing

responsibilities after the project is finished. The Project Manager will coordinate with functional managers to ensure these added tasks are managed effectively. Once the project is completed, these tasks will be removed from the internal staff's responsibilities by their functional managers, allowing them to return to their regular duties without the added project-related workload. This approach ensures a balanced allocation of resources and a smooth transition back to normal operations.

4.2.18.5 Project Review and Closure. The final step in the project close-out process involves a thorough review and documentation of the project management practices used. The Project Manager will conduct a review meeting with the project team to discuss what worked well and areas for improvement. Feedback from all stakeholders will be gathered to inform this review. The Fleet Engineer will then compile this feedback into a structured lesson-learned document, identifying key successes and areas for improvement. This document will be shared with relevant departments to inform future projects. Finally, the Project Manager will compile a final report summarizing all project activities, achievements, and lessons learned. This report will include all acceptance documents, contracts, and review findings, and will be submitted to the sponsor and relevant stakeholders. All project documents will be archived in the central repository, formally concluding the Vessel Eye BI Tool project.

5 CONCLUSIONS

A well-structured Project Management Plan was developed to guide the successful development and implementation of the Vessel Eye BI Tool, which will enhance COGL's work prioritization and risk-tracking abilities across its fleet of FPSO units.

As part of the Current State Assessment, a comprehensive assessment of AMOS by SpecTec, OsiSoft PI Vision, and Power Automate was conducted to understand what capabilities COGL currently has and whether these capabilities are suitable to achieve the Project Sponsor's vision. None of the three tools was able to meet the scope requirements shared by the Sponsor; however, they can serve as a data source for the Vessel Eye BI Tool.

The scope for the Vessel Eye project was meticulously crafted through an exhaustive requirements-gathering process, which included comprehensive stakeholder interviews. This is detailed in a Scope Management Plan, and the process has ensured that the project scope encompasses the design, development, and testing phases of the BI tool, aligning it with industry-specific requirements and ensuring compatibility with existing infrastructure. With an activity cost estimate of $7,000, excluding contingencies and reserves, and a timeframe of 4 months, the BI tool will be designed to provide advanced analytics and visualization capabilities, empowering efficient decision-making and risk management insights.

The project's Work Breakdown Structure was prepared using MS Project and updated to reflect an estimated 4-month duration. The schedule baseline was prepared considering all critical dependencies, which highlighted the project's critical path. The schedule does

not have a significant amount of float; if any activities are delayed, the project will not finish within schedule. This was reflected in the Schedule Management Plan.

Activity cost estimates were outlined in the project's Cost Management Plan, which also presents the Cost Baseline. The estimates provided in the approved Project Charter were used to form the estimates, after which the management and contingency reserves were allocated, and these will be monitored through earned value management.

An integrated quality management approach was selected for this project to ensure high-quality standards for both the product and processes. This is detailed in the Quality Management Plan and included defining quality standards, quality measurements, and ways to improve quality to meet the project's objectives continuously. Organizational quality standards were recommended since limited external stakeholders are in the Stakeholder Register.

The Procurement and Resources Management Plan elaborated on why a Time and Materials contract was selected for the External Consultant and how the project work will be completed using internal employees. The project manager and functional manager must meet to prepare the resource calendar to ensure the project is completed on time.

The Risk Management Plan identified the project's major risks. The project schedule incorporates the most probable and impactful risks to ensure the prompt implementation of mitigation measures. These risks will be updated during bi-weekly project team meetings, aligning with their scheduled timeframe. Risks will be continuously identified, monitored, and addressed throughout the project lifecycle.

The Stakeholder Register was developed and included in the Scope Management Plan since this plan was developed based on stakeholder feedback to determine the scope of the Vessel Eye BI Tool. These stakeholders are future identified as part of a Communications Management Plan that outlines what methods are to be used for formal and informal communications, the frequency, and by whom. It also outlines the power, interest, and influence of these stakeholders and how the project manager will engage them.

The Project Close-Out Plan ensures a smooth transition of the BI Tool to operational status by providing training, documentation, and tools. It verifies goal achievement, scope completion, and contract fulfillment. Internal staff will revert to regular duties post-project, and lessons learned will be documented for future reference.

6 RECOMMENDATIONS

1. The Data Scientists, Development, and Quality Team should develop a comprehensive data governance plan to ensure the accuracy, integrity, and security of the data used by the Vessel Eye BI Tool. This plan should outline data ownership, data quality standards, data lifecycle management, data access controls, and data privacy measures. Establishing robust data governance will enhance the reliability and trustworthiness of the insights derived from the BI tool.
2. For the Project Management Team, it is recommended to develop a performance measurement plan to help track the effectiveness and impact of the Vessel Eye BI Tool post-implementation. This plan should define key performance indicators (KPIs) aligned with project objectives and establish mechanisms for collecting, analyzing, and reporting performance data. By regularly assessing the tool's performance, COGL can identify areas for improvement and optimize its functionality to meet evolving business needs.
3. For the Business Analyst/Fleet Engineer and Management Team, it is recommended to create a sustainability plan to ensure the long-term viability and relevance of the Vessel Eye BI Tool beyond its initial implementation phase. This plan should address factors such as technology updates, scalability, maintenance requirements, and ongoing support mechanisms. By planning for sustainability upfront, COGL can maximize the return on investment in the BI tool and avoid potential disruptions to its operational effectiveness.

4. The Project Management Team should establish a knowledge management plan to capture and share lessons learned from the development and implementation of the Vessel Eye BI Tool. This plan should document best practices, challenges encountered, solutions implemented, and insights gained throughout the project lifecycle. By institutionalizing knowledge transfer, COGL can leverage past experiences to inform future projects and continuously improve its project management practices.
5. For the Data Scientists and Development Teams, it is recommended that they develop an integration plan to ensure seamless operation between the Vessel Eye BI Tool and other existing systems. This plan should identify potential integration points, outline data flow processes, and establish protocols for data exchange. Ensuring seamless integration will enhance data consistency and enable more comprehensive insights across different platforms.
6. For the Project Management Team, it is recommended to perform a comprehensive make-or-buy analysis to evaluate whether to develop a new BI Tool in-house or to outsource its development. This analysis should take into account the sponsor's requirements, the capabilities of COGL’s current tools, and the availability of market-ready solutions. By considering factors such as cost, time, expertise, and alignment with project goals, COGL can make an informed decision that optimizes resource utilization and ensures the BI Tool meets all specifications efficiently.

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

Regenerative development is a framework aimed at solving global challenges by reversing the negative impacts of humankind on the planet, thereby preserving and improving the world we live in (Mang & Haggard, 2016). The framework, therefore, aims to ensure that the next generation will be happier overall and have access to more resources and opportunities. Regenerative development differs from more traditional economic development in that it focuses on culture and participatory and adaptive governance (Mang & Haggard, 2016). The core of regenerative development is to harmonize human consciousness and behavior with the principles and characteristics of living systems to create a "better world" for the future.

While the project primarily focuses on developing a Business Intelligence (BI) tool for maintenance planning in the Oil and Gas sector, its implications extend to the broader context of regenerative and sustainable development. By integrating BI technology into maintenance planning processes, the project can contribute to enhancing operational efficiency, optimizing resource utilization, and reducing environmental impacts within the Oil and Gas industry. This optimization aligns with sustainability principles by promoting the responsible use of resources and minimizing waste generation.

Furthermore, the BI tool's capability to prioritize work and track risks can foster proactive maintenance strategies, thereby reducing the likelihood of equipment failures, operational disruptions, and associated environmental risks. This proactive approach

enhances asset reliability and safety and mitigates the potential for environmental incidents, contributing to sustainable operations and minimizing ecological footprints.

Additionally, by providing insights into maintenance needs and performance metrics, the BI tool enables data-driven decision-making, facilitating continuous improvement and innovation in operational practices. This emphasis on data-driven optimization aligns with the principles of regenerative development, which seek to create adaptable, resilient systems capable of regenerating resources and ecosystems.

7.1 P5 Impact Analysis Using the P5 Standard

The P5 Standard, developed by Green Project Management, is a framework designed to integrate sustainability principles into project management practices. It focuses on five key areas: people, planet, prosperity, peace, and partnership, aiming to ensure projects contribute positively to environmental, social, and economic sustainability (GPM Global, 2019). The P5 Impact Analysis is a tool used within this framework to assess a project's potential impacts across these dimensions. It involves evaluating how project activities and decisions affect people, the planet, prosperity, peace, and partnership and identifying strategies to maximize positive outcomes while minimizing negative ones (GPM Global, 2019). Through this analysis, organizations can better understand the holistic impact of their projects and make informed decisions to promote sustainability.

Figure 18

Overall Summary of Scores Based on the Project Sustainability Impacts

People Impacts	Initial Impact Score	New Impact Score	Change
Labor Practices and Decent Work	3.4	4.4	1.0
Society and Customers	5.0	5.0	0.0
Human Rights	4.0	4.0	0.0
Ethical Behavior	4.0	4.7	0.7
Overall People Score		4.3	

Planet Impacts	Initial Impact Score	New Impact Score	Change
Transport	3.6	4.2	0.6
Energy	4.7	4.7	0.0
Land Air, and Water		4.7	
Consumption	5.0	5.0	0.0
Overall Planet Score		4.7	

Prosperity Impacts	Initial Impact Score	New Impact Score	Change
Project Feasibility	3.7	4.6	0.9
Business Agility			
Local Economic Impact			
Overall Prosperity Score		4.6	

Overall Project Score	4.5

Note. Adapted from Global Green Project Management. (n.d.). P5^{TM} Impact Analysis v5.5. Creative Commons License.

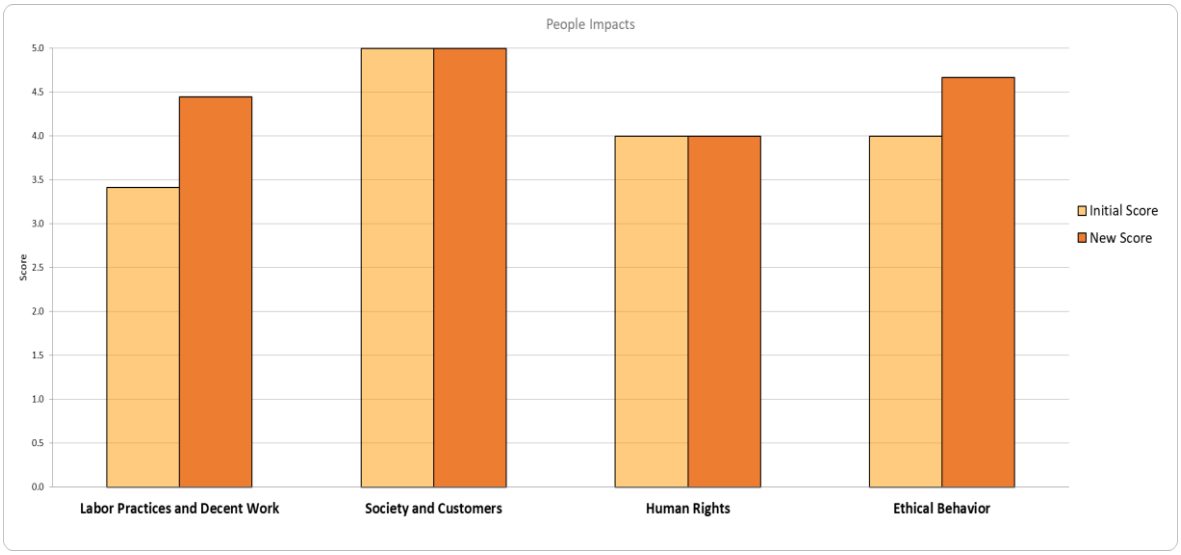
7.1.1 People

Based on the analysis, each cause represents a potential threat to sustainability, ranging from limited investment in training programs to unequal access to technology and its benefits. The proposed responses aim to mitigate these impacts and improve sustainability by addressing critical issues such as resource misallocation, inadequate communication, and lack of diversity. Organizations can minimize negative impacts and

promote sustainable practices by implementing targeted strategies such as increasing investment in training, enhancing transparency, and fostering inclusivity. Figure 19 summarizes the score attributed before and after the sustainability practices are applied to the project. The initial scoring is excellent, as such responses are in place to sustain the practices with enthusiasm.

Figure 19

Summary of the Impact Before and After Sustainability Practices are Adapted for People



Note. Adapted from Global Green Project Management. (n.d.). P5^{TM} Impact Analysis v5.5. Creative Commons License.

Furthermore, the proposed responses seek to elevate sustainability by fostering a culture of fairness, transparency, and innovation within project environments. Organizations can enhance employee engagement, retention, and overall project efficiency by addressing disparities in career advancement, promoting diversity and inclusivity, and implementing robust data privacy measures. These responses highlight the importance of integrating

sustainability considerations into various aspects of project management, from workforce development to procurement processes, to ensure long-term success and positive environmental, social, and economic outcomes.

7.1.2 Planet

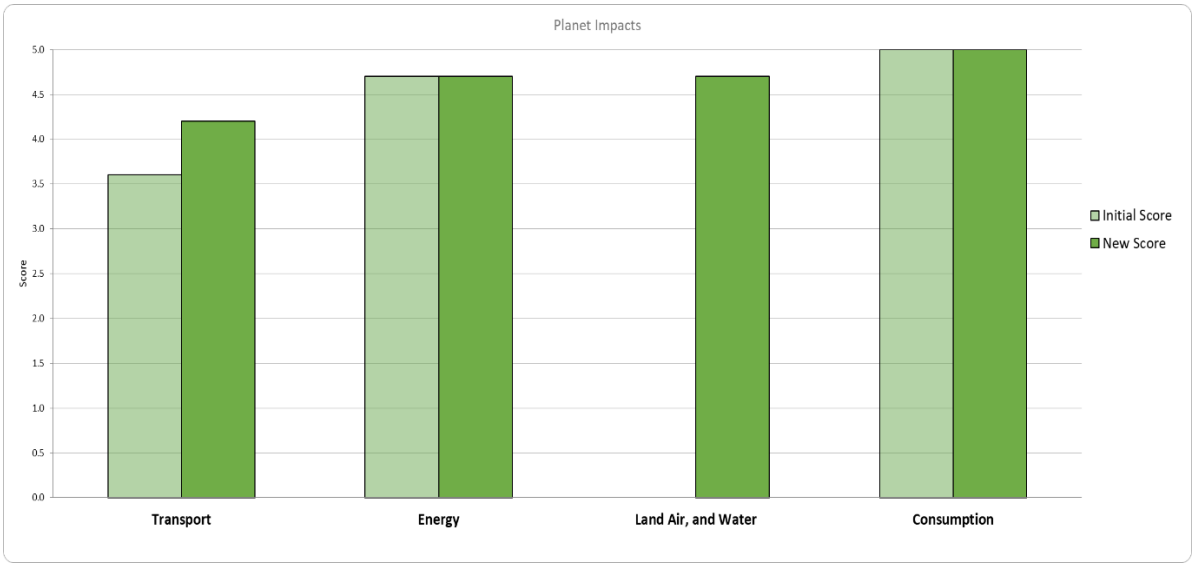
Issues such as limited accessibility, high carbon emissions, and improper waste disposal are identified as root causes of sustainability concerns, potentially leading to exclusion, environmental degradation, and inefficient resource utilization. However, the proposed responses aim to address these issues effectively, ranging from enhancing accessibility measures and investing in renewable energy to implementing proper waste management practices. These responses are anticipated to sustain or improve the project's sustainability performance by reducing environmental impact, promoting inclusivity, and optimizing resource usage.

Upon implementation of the proposed responses, the project's overall sustainability score is expected to either sustain or increase, reflecting enhanced practices and outcomes. By prioritizing accessibility, renewable energy adoption, and responsible waste management, the project can mitigate adverse environmental and social impacts while fostering inclusivity and efficiency. These measures align with sustainability goals, ensuring that the project operates in a manner that is both environmentally responsible and socially equitable, ultimately contributing positively to sustainable development objectives. Through proactive sustainability management, the project can address critical challenges and maximize its positive impact on environmental, social, and economic dimensions.

Figure 20 summarizes the score attributed before and after the sustainability practices are applied to the project. The initial scoring is excellent, as such responses are in place to sustain the practices with enthusiasm.

Figure 20

Summary of the Impact When Sustainability Practices are Adapted for the Planet



Note. Adapted from Global Green Project Management. (n.d.). P5^{TM} Impact Analysis v5.5. Creative Commons License.

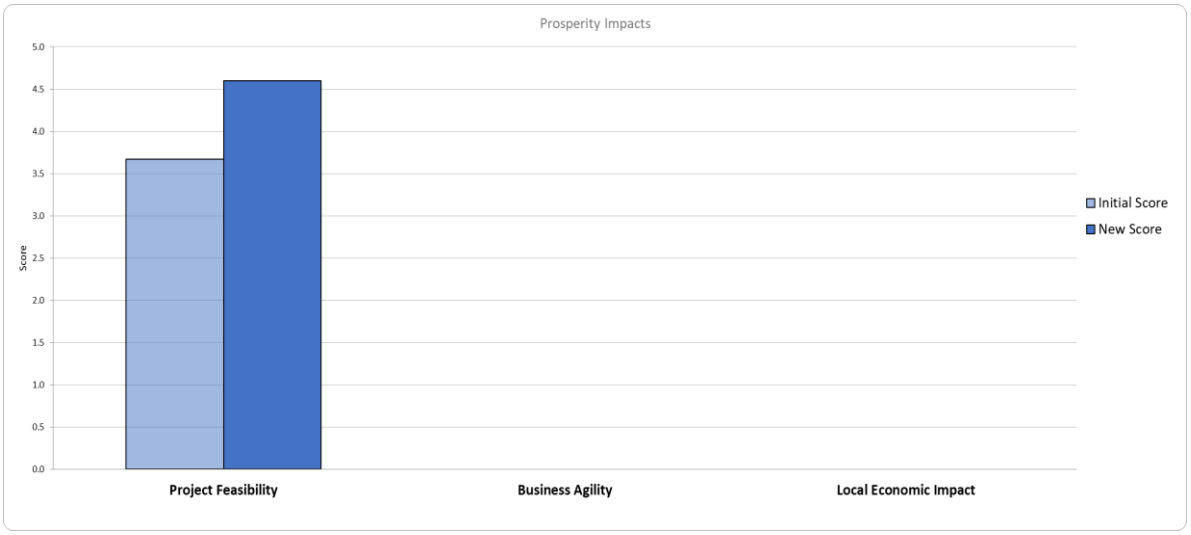
7.1.3 Prosperity

Key issues, such as resource misallocation, incomplete analysis of sustainability impacts, and neglect of sustainability factors in decision-making, are identified as root causes of sustainability challenges. These issues often result in financial bias, unbalanced resource distribution, and a lack of consideration for long-term environmental and social impacts, all of which contribute to the project's overall sustainability score.

The proposed responses aim to address these challenges by introducing strategies to prioritize sustainability goals, enhance assessment methods, and integrate sustainability criteria into decision-making processes. By implementing these responses, the project can mitigate financial waste, promote equitable resource allocation, and ensure comprehensive consideration of environmental and social impacts, ultimately improving its overall sustainability performance. This analysis highlights the importance of proactive sustainability management strategies in addressing key challenges and maximizing positive impacts on environmental, social, and economic dimensions. Figure 21 summarizes the score attributed before and after the sustainability practices are applied to the project. The initial scoring is excellent, as such responses are in place to sustain the practices with enthusiasm.

Figure 21

Summary of the Impact When Sustainability Practices are Adapted for Prosperity



Note. Adapted from Global Green Project Management. (n.d.). P5^{TM} Impact Analysis v5.5. Creative Commons License.

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9 APPENDICES

9.1 Appendix 1: FGP Charter

CHARTER OF THE PROPOSED

FINAL GRADUATION PROJECT (FGP)

1. Student name

Ashford Leroy Thom

2. FGP name

Revolutionizing Oil and Gas Maintenance: A Project Management Plan for Unleashing Smart Business Intelligence (BI) for Enhanced Work Prioritization and Risk-Tracking.

3. Application Area (Sector or activity)

Oil and Gas

4. Student signature

Ashford Leroy Thom

5. Name of the Graduation Seminar facilitator

Róger Valverde Jiménez

6. Signature of the facilitator

7. Date of charter approval

8. Project start and finish date

January 8, 2024	June 21, 2024

9. Research question

What are the key factors influencing the successful implementation of Smart BI for enhanced risk-tracking and work prioritization in oil and gas maintenance projects?

10. Research hypothesis

A well-structured Project Management Plan is positively correlated with the successful implementation of Smart Business Intelligence (BI) for enhancing work prioritization and risk-tracking in oil and gas maintenance.

11. General objective

Develop a well-structured Project Management Plan that will guide the successful development and implementation of a Smart Business Intelligence (BI) tool that will be used to enhance work prioritization and risk-tracking in Oil and Gas Maintenance.

12. Specific objectives

1. To analyze three tools that are currently used by Oil and Gas companies for maintenance planning (work prioritization and risk-tracking) to understand what features are needed for the new integrated BI tool.
2. To clearly define the scope of the Smart BI tool project, outlining its boundaries, functionalities, and limitations by eliciting and documenting detailed requirements from stakeholders, with a specific focus on work prioritization and risk-tracking needs in Oil and Gas Maintenance.
3. Develop a project schedule that outlines all project activities, dependencies, and milestones.
4. Estimate project costs effectively, plan resource allocations and cost control for the project lifecycle
5. Develop a robust quality management plan to ensure standards are met and stakeholder expectations are prioritized.
6. Estimate project resources and how they can be acquired and managed.
7. Develop a communication plan that ensures timely and relevant information exchanges.
8. Identify, assess, and plan mitigation of project risks to minimize potential negative impacts.
9. Develop a procurement plan that outlines the procurement processes.
10. Identify and analyze project stakeholders to effectively manage their expectations.
11. To develop a well-structured Project Management Plan for the development and implementation of the BI tool using the tools analysis and well-defined scope document by integrating Specific Objectives 3 to 10.

13. FGP purpose or justification

1. The organization currently does not have a Project Management Plan in place to guide the execution of the project, encompassing both the development and implementation phases.
2. By eliciting and documenting detailed requirements from stakeholders, with a specific emphasis on work prioritization and risk-tracking in Oil and Gas Maintenance, boundaries, functionalities, and limitations of the proposed tool can be established. This meticulous scoping process is vital to ensure that the resulting BI tool aligns seamlessly with the industry's unique requirements, ultimately contributing to streamlined operations and improved decision-making.
3. The disparate use of multiple tools has led to inefficiencies, resulting in increased maintenance costs and elevated risks. The implementation of a unified BI tool tailored to the specific needs of the organization is anticipated to yield a 60% reduction in maintenance costs and a 30% increase in overall operational efficiency.

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

1. FGP
    1.1 FGP Graduation Seminar
        1.1.1 Introduction
        1.1.2 Theoretical framework
        1.1.3 Methodological framework
        1.1.4 Preliminary bibliographical research
        1.1.5 Annexes (FGP schedule, FGP WBS, FGP Charter)
    1.2 FGP Development
        1.2.1 Tool Analysis Report
            1.2.1.1 Review of Features
            1.2.1.2 Advantages and Disadvantages
            1.2.1.3 Current Use Cases
        1.2.2 Project Scope Document
            1.2.2.1 Scope of Features Required
            1.2.2.2 Summary of Uses Cases
            1.2.2.3 Gap Assessment between Tool Analysis Report and Scope OF Features Required
        1.2.3 Project Management Plan
            1.2.3.1 Schedule Management Plan
            1.2.3.2 Cost Management Plan
            1.2.3.3 Quality Management Plan
            1.2.3.4 Resource Management Plan
            1.2.3.5 Communications Management Plan
            1.2.3.6 Risk Management Plan
            1.2.3.7 Procurement Management Plan
            1.2.3.8 Scope Management Plan
            1.2.3.9 Stakeholder Engagement Plan
        1.2.4 Validation of the FGP in the field of Regenerative and Sustainable Development
        1.2.5 Conclusions
        1.2.6 Recommendations
        1.2.7 Reference lists
        1.2.8 Annexes
        1.2.9 Tutor approval for reading.
    1.3 Reader's review.
    1.4 Board of examiners evaluation.

15. FGP budget

Category	**Amount (USD)**

Human Resources 1. Interviews with Tools Experts	$400.00
Software Licenses 1. AMOS 2. OsiSoft 3. Power Automate	 $500.00 $500.00 $500.00
Information Processing	$200.00
TOTAL BUDGET	$2100.00

16. FGP planning and development assumptions

1. No additional software licenses will be required to execute the FGP other than those mentioned.
2. The quality and quantity of information available on the software that will be analyzed is adequate to carry out the FGP.
3. A significant portion of the stakeholders that will use the BI tool will participate in crafting the scope document to aid the development phase of the project.
4. There will be no unforeseen regulatory changes impacting the development and implementation of the Smart BI tool.
5. It is assumed that all activities outlined to complete the FGP will be completed in accordance with the schedule.

17. FGP constraints

1. The maximum time frame to finalize the FGP is 12 weeks.
2. The tools to be analyzed are limited to AMOS, OsiSoft, and Power Automate.
3. The project is limited to a budget limit of $2100.00 USD
4. The project is constrained to the availability of human resources during the scope development and BI tool implementation stages to participate in interviews and focus groups.
5. The project is constrained by the availability and quality of data required for the analysis of existing tools.

18. FGP development risks

1. If the information gathered from the selected tools is incomplete, inaccurate, or insufficient, it may hinder the ability to make informed decisions during the tool analysis phase.
2. If additional software licenses are required, the project will exceed the planned budget.
3. There is a risk that stakeholders may exhibit resistance or reluctance to actively engage in the process. Inadequate stakeholder involvement during the execution of the FGP may result in a lack of comprehensive insights, potentially hindering the effectiveness of the BI tool.
4. The execution of the FGP involves handling sensitive data in the Oil and Gas industry, introducing risks related to data security and privacy.

19. FGP main milestones

Deliverable	**Finish estimated date**
1.1 FGP Graduation Seminar	02-25-2024
1.2 FGP Development	05-26-2024
1.2.1 Tool Analysis Report	03-20-2024
1.2.2 BI Tool Scope Document	03-29-2024
1.2.3 Project Management Plan	05-03-2025
1.3 Readers review	06-26-2024
1.4 Post Reading Review Adjustments	07-26-2024
1.5 Board of examiners evaluation	08-26-2024

20. Theoretical framework

20.1 Estate of the “matter”

Caribbean Oil and Gas Ltd. (COGL) is a leading player in the offshore energy sector and is committed to innovation and sustainability. However, COGL faces challenges in prioritizing maintenance activities and tracking risks for its Floating Production, Storage, and Offloading (FPSO) units. Current Business Intelligence (BI) tools lack a unified approach, hindering efficient decision-making. To address this, COGL aims to develop an integrated BI tool tailored to end users' needs in work-prioritization and risk-tracking. This tool will consolidate data, providing a unified platform for analysis and visualization. Leveraging advanced analytics and predictive modeling will enable COGL to optimize maintenance activities and allocate resources effectively. By empowering stakeholders with

actionable insights, COGL seeks to enhance operational efficiency and ensure the continued success of its offshore energy operations.

20.2 Basic conceptual framework

1. Project Management Principles
2. Project Management Domains
3. Project Management Methodologies/ Approaches
4. Project Management Knowledge Areas and Process Groups
5. Project Life Cycle Approach
6. Business Intelligence
7. Company Framework
8. Organization Mission and Vision
9. Oil and Gas Technologies

21. Methodological framework

The chosen mixed-method research approach for the Final Graduation Project (FGP) integrates qualitative and quantitative methodologies to comprehensively address the complexities of maintenance planning within the Oil and Gas sector. Through interviews, focus groups, and workshops with key stakeholders, including maintenance personnel, managers, and IT specialists, qualitative insights were gathered to inform the development of an integrated BI tool. Internal data such as historical maintenance records supplemented these qualitative findings, providing valuable context and grounding the project in real-world challenges. Additionally, secondary sources, including industry reports, publications, and academic journals, augmented the research, offering insights into industry trends, BI tool usage, and theoretical frameworks pertinent to the project's objectives.

The deliverables produced from this research provide a robust framework for managing the development and implementation of the Smart BI tool. Each document, from the Tools Analysis Report to the Project Stakeholder Management Plan, is meticulously crafted to address specific project needs, such as defining scope, managing resources, and mitigating risks. By synthesizing insights from both primary and secondary sources, the project is poised to deliver a tailored solution that addresses the unique maintenance planning requirements of the Oil and Gas sector while also contributing valuable knowledge to the broader field through the dissemination of research findings in academic and industry forums.

Specific Objective	Name of Deliverable	Information Sources	Research Method	Tools	Restrictions
To analyze three tools that are currently used by Oil and Gas companies for maintenance planning (work prioritization and risk-tracking).	Tools Analysis Report	Primary: Stakeholder interviews, internal data. Secondary: Industry reports, academic journals	Mixed-method approach	Interviews, data analysis	Limited access to internal data
To clearly define the scope of the Smart BI tool project, outlining its boundaries, functionalities, and limitations by eliciting and documenting detailed requirements.	Scope Management Plan	Primary: Stakeholder workshop interviews. Secondary: Industry reports, academic journals	Mixed-method approach	Workshops, interviews, document analysis	Time constraints for stakeholder engagement
To develop a well-structured Project Management Plan for the development and implementation of the BI tool using the analysis and well-defined scope.	Project Management Plan	Primary: Stakeholder consultations, internal data Secondary: Project management literature, industry reports	Qualitative and quantitative research	Consultations, data analysis, document review	Limited availability of project management literature
Develop a project schedule that outlines all project activities, dependencies, and milestones.	Schedule Management Plan	Primary: Project team consultations and industry benchmarks. Secondary: Project management literature and best practices documents.	Qualitative research	Consultations, document review	Dependence on project team availability
Estimate project costs effectively, plan resource allocations and cost control for the project lifecycle.	Cost Management Plan	Primary: Financial data analysis and stakeholder consultations. Secondary: Industry reports, academic journals	Quantitative research	Financial analysis, consultations	Uncertainty in financial data availability

Specific Objective	Name of Deliverable	Information Sources	Research Method	Tools	Restrictions
Develop a robust quality management plan to ensure standards are met, and stakeholder expectations are prioritized.	Quality Management Plan	Primary: Stakeholder feedback and internal quality metrics. Secondary: Quality management literature, industry standards	Qualitative research	Interviews, document analysis	Incomplete internal quality metrics
Estimate project resources and how they can be acquired and managed.	Resources Management Plan	Primary: Resource availability assessment and stakeholder consultations. Secondary: Project management literature, industry reports	Quantitative research	Analysis of resource availability, consultations	Uncertainty in resource availability
Develop a communication plan that ensures timely and relevant information exchanges.	Communications Management Plan	Primary: Stakeholder communication preferences and project team discussions. Secondary: Communication theory, industry case studies	Mixed-method approach	Workshops, document analysis, stakeholder surveys	Variability in stakeholder communication preferences
Identify, assess, and plan mitigation of project risks to minimize potential negative impacts.	Risk Management Plan	Primary: Risk identification workshops, stakeholder interviews Secondary: Risk management literature, industry case studies	Mixed-method approach	Workshops, interviews, document review	Resistance to risk identification
Develop a procurement plan that outlines the procurement processes.	Procurement Management Plan	Primary: Procurement team discussions and market analysis. Secondary: Procurement	Qualitative research	Discussions, document analysis	Complexity in procurement regulations

Specific Objective	Name of Deliverable	Information Sources	Research Method	Tools	Restrictions
		regulations, industry benchmarks			
Identify and analyze project stakeholders to effectively manage their expectations.	Stakeholder Management Plan	Primary: Stakeholder mapping exercises, interviews Secondary: Stakeholder theory, industry reports	Mixed-method approach	Workshops, interviews, document review	Stakeholder availability for mapping exercises and interviews

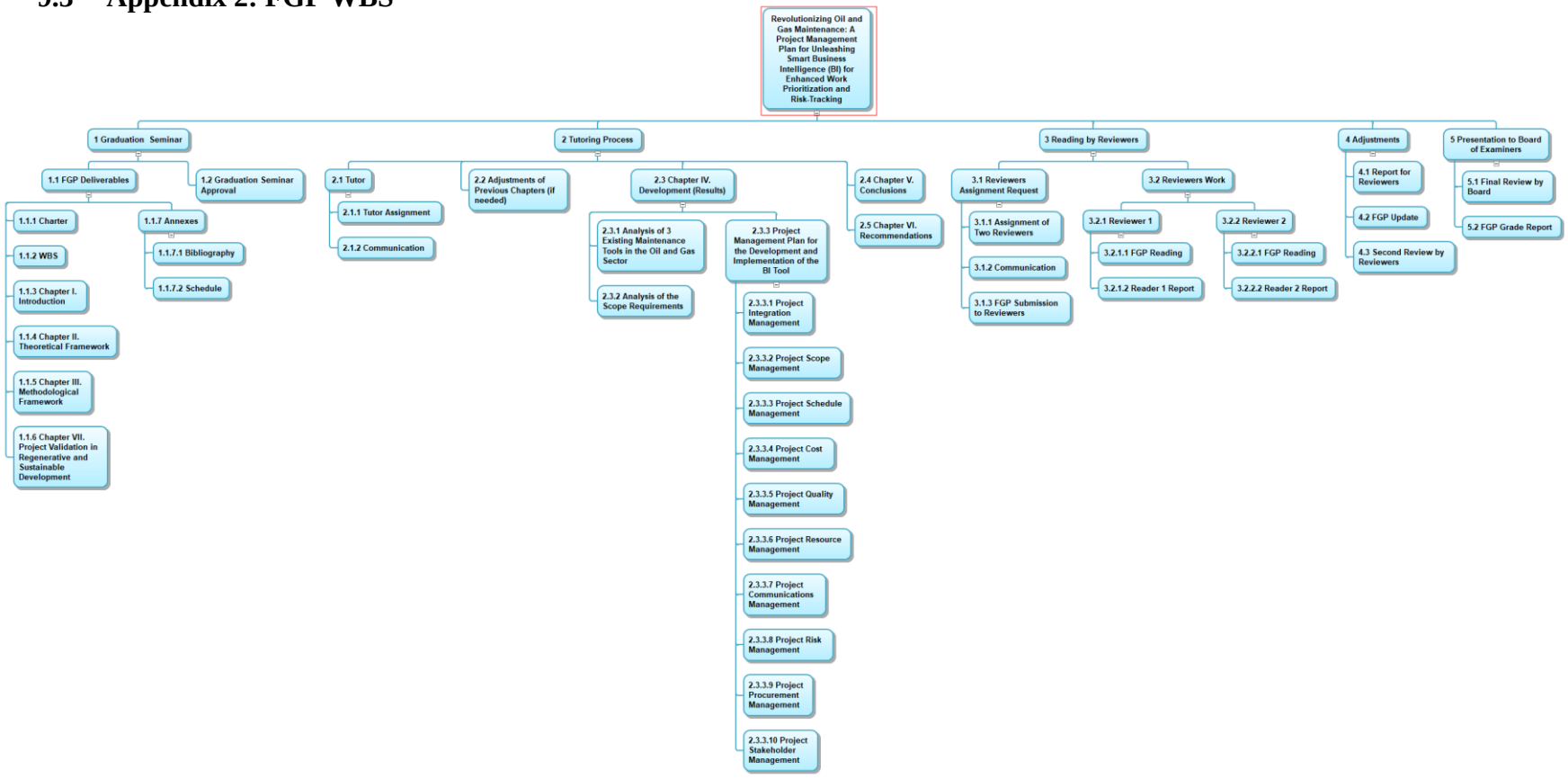
22. Validation of the work in the field of regenerative and sustainable development.

While the project primarily focuses on developing a Business Intelligence (BI) tool for maintenance planning in the Oil and Gas sector, its implications extend to the broader context of regenerative and sustainable development. By integrating BI technology into maintenance planning processes, the project can contribute to enhancing operational efficiency, optimizing resource utilization, and reducing environmental impacts within the Oil and Gas industry. This optimization aligns with the principles of sustainability by promoting the responsible use of resources and minimizing waste generation.

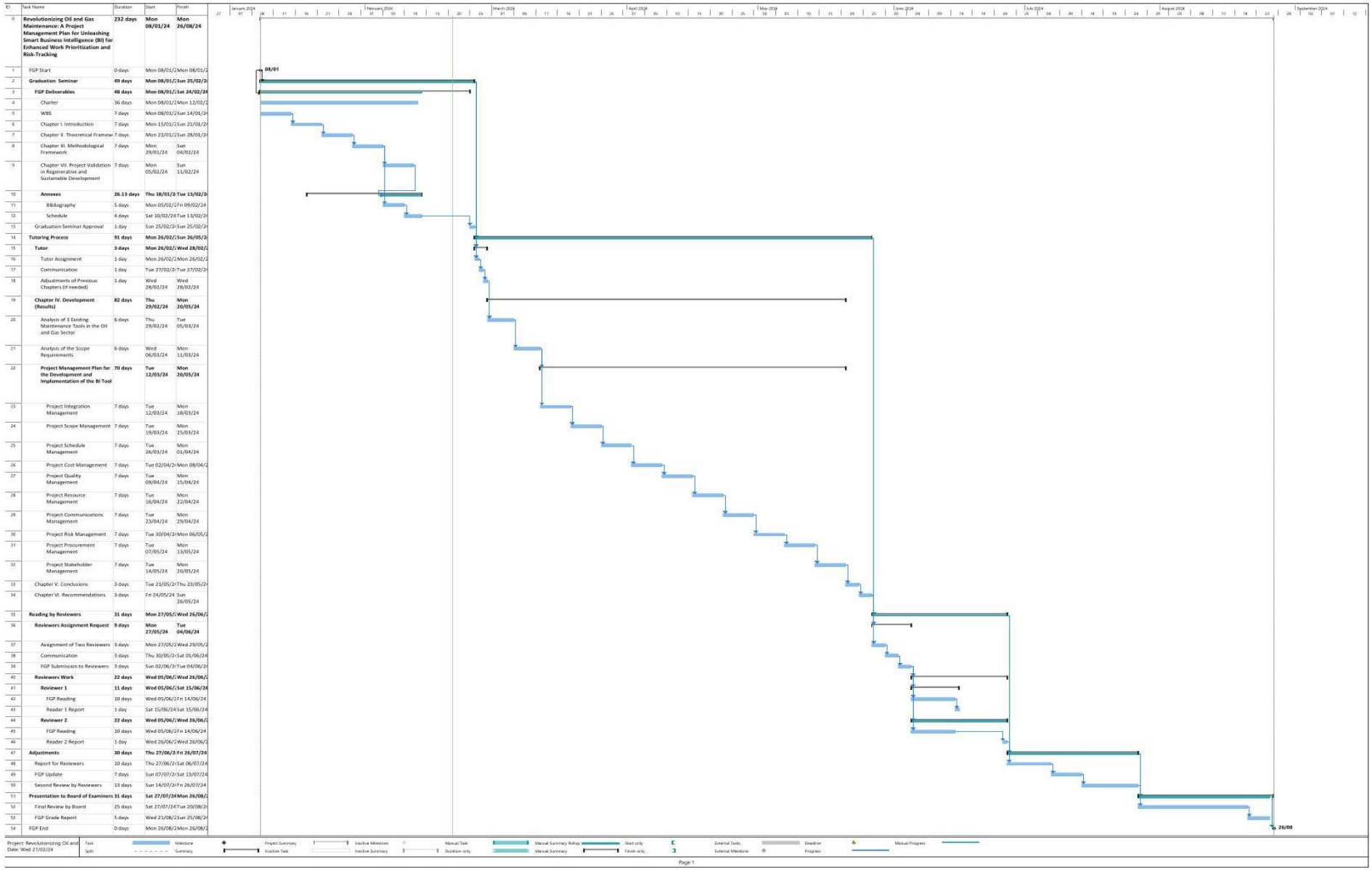
Furthermore, the BI tool's capability to prioritize work and track risks can foster proactive maintenance strategies, thereby reducing the likelihood of equipment failures, operational disruptions, and associated environmental risks. This proactive approach not only enhances asset reliability and safety but also mitigates the potential for environmental incidents, contributing to sustainable operations and minimizing ecological footprints.

Additionally, by providing insights into maintenance needs and performance metrics, the BI tool enables data-driven decision-making, facilitating continuous improvement and innovation in operational practices. This emphasis on data-driven optimization aligns with the principles of regenerative development, which seek to create systems that are adaptable, resilient, and capable of regenerating resources and ecosystems.

9.3 Appendix 2: FGP WBS



9.4 Appendix 3: FGP Schedule



Appendix 3: Vessel Eye Project Charter

Project Charter		
DATE	**PROJECT NAME**	
January 8, 2024	Vessel Eye: Work Prioritization and Risk Tracking Smart BI Tool	
PROJECT LIFE CYCLE	Hybrid	
KNOWLEDGE AREA / PROCESS GROUP	**Application Area (Sector / Activity)**	
Processes: 1. Initiation, Planning, Execution, Monitoring & Control, Closure **Knowledge Areas:** 1. Integration Management 2. Scope Management 3. Schedule Management 4. Cost Management 5. Stakeholders Management 6. Quality Management 7. Resource Management 8. Communication Management 9. Risk Management 10. Procurement Management	Multisectoral: Health, Safety, and Environmental, Technology, Business Development	
Tentative Start Date	**Tentative Completion Date**	**Duration (months)**
July 1, 2024	November 1, 2024	Four months

Project Objectives
General Objective Develop and implement a Smart BI Tool that provides a comprehensive overview of the healthcare status of operations critical equipment deployed on the FPSO (Floating Production Storage and Offloading) unit.

Specific Objectives

1. Conduct a Current State and Future State Vision Assessment to determine whether the general objective can be achieved using current tools or if a new tool is required.
2. Illustrate the Production Process Flow and Identify Operations Critical Equipment.
3. Define metrics for the healthcare status determination.
4. Develop a color-coded system associated with the healthcare status determined.
5. Display threats affecting equipment healthcare in the form of work orders and corrective/preventive actions
6. Integrate the previous deliverables in a Smart BI Tool

Justification or purpose of the project (Contribution and expected results)

Within the operational framework of the FPSO (Floating Production Storage and Offloading) unit, there exists a significant challenge related to effectively managing the healthcare status of critical equipment. Currently, there lacks a centralized system that provides real-time insights into equipment health, hindering informed decision-making processes regarding work prioritization and risk management. This gap in monitoring and assessment poses potential threats to operational continuity, leading to increased downtime and compromised safety measures.

The Smart BI Tool Project presents a comprehensive solution aimed at providing a holistic overview of equipment health within the FPSO environment. By leveraging advanced analytics and visualization techniques, the Smart BI Tool offers a user-friendly platform tailored to the specific needs of the FPSO unit. Through the implementation of functionalities such as mapping production process flows, defining clear metrics for healthcare status determination, implementing a color-coded system for status display, and visualizing potential threats affecting equipment health, the project ensures that stakeholders have access to actionable insights for proactive decision-making and risk mitigation. This solution not only enhances operational efficiency but also improves asset management practices, thereby contributing to the long-term sustainability and safety of FPSO operations.

DELIVERABLES

Deliverables Associated with Specific Objective 1:

1. Analysis of three BI tools currently in use (current state assessment)
2. Project sponsor's future state vision (future state assessment)
3. Proposed solution to close the gap between the current and future states.

Deliverables Associated with Specific Objective 2:

1. Illustrated process flow of operations critical equipment.

Deliverables Associated with Specific Objective 3:

1. List of metrics for the determination of healthcare status

Deliverables Associated with Specific Objective 4:

1. Color-coded system associated with the healthcare status determined from the metrics.

Deliverables Associated with Specific Objective 5:

1. Defined input, processing, and output of work orders and corrective/preventive actions

Deliverables Associated with Specific Objective 6:

1. An integrated Smart BI tool that can be tailored to varying FPSO units.

PRELIMINARY RISK IDENTIFICATION

1. Inaccurate or incomplete information being used as input may lead to flawed insights and incorrect decision-making.
2. Integrating the BI tool with existing systems and databases within the FPSO environment could pose technical challenges, potentially resulting in delays or disruptions in the project timeline.
3. Resistance to change or inadequate training among end-users may hinder the effective utilization of the BI tool or impact its overall effectiveness in supporting the decision-making process.
4. Ensuring the security and confidentiality of sensitive data stored and processed by the

BI tool is crucial to prevent unauthorized access or data breaches.

5. Dependency on third-party technologies or software components for the BI Tool's functionality may expose the project to risks related to compatibility issues.
6. Adhering to industry regulations and compliance standards regarding data privacy, security, and operational practices presents a potential risk that must be managed throughout the project lifecycle.

ASSUMPTIONS

1. It is assumed that stakeholders will actively engage and provide necessary support and input throughout the project, ensuring alignment with organizational goals and objectives.
2. The availability of skilled personnel, financial resources, and technological infrastructure necessary for the successful development and implementation of the BI tool is assumed.
3. It is assumed that the required data for the BI tool's functionality, including historical equipment performance data and production process information, will be accessible and readily available.
4. The BI tool is assumed to be scalable and capable of accommodating future growth and evolving business needs within the FPSO environment without significant reengineering or redevelopment efforts.
5. It is assumed that senior management will demonstrate commitment and leadership support for the project, facilitating decision-making and resource allocation as needed.

RESTRICTIONS

1. **Resources/Budget** – The project is constrained by budget limitations, requiring careful allocation and prioritization of resources to ensure cost-effectiveness.
2. **Schedule** – There are predefined project timelines and deadlines that must be adhered to, limiting the duration available for project execution and delivery.
3. **Scope -** The project must operate within the technological constraints of existing

infrastructure and systems within the organization, potentially limiting the scope and functionality of the BI tool

4. **Scope** – Compliance with industry regulations and standards imposes constraints on certain project activities and deliverables, necessitating adherence to specific protocols and procedures implemented within the organization.
5. **Resource** – Constraints related to the availability of skilled personnel and technology may impact project execution and delivery timelines, requiring careful resource management and planning.

General Resources and Budget					
Deliverable	**Name of the resource**	**Unit**	**Qty**	**Unit Cost (USD)**	**Total Cost (USD)**
Integrated Smart BI Tool	Project Management Tools - Subscription	Subscription	1	$500.00	$500.00
	Consultation and Expertise - External Consultant Fees	Hour	10	$200.00	$2,000.00
	Internal Employee Compensation	Hour	80	$25.00	$2,000.00
	Miscellaneous Expenses - Contingency Funds	Lump Sum	1	$500.00	$500.00
	Training and Development - Documentation - Training Sessions	Document Session	1 2	$500.00 $750.00	$500.00 $1,500.00
				TOTAL	$7,000.00

Milestone Schedule:	**End date**
Current State and Future State Vision Assessment	July 15, 2024
Production Process Flow Illustration and Equipment Identification	August 7, 2024

Metrics Definition for Healthcare Status Determination	August 21, 2024
Color-Coded System Development	September 7, 2024
Graphical Representation of Threats	September 30, 2024
Smart BI Tool Integration	November 1, 2024

Relevant historical information

Caribbean Oil and Gas Ltd. (COGL) is a leading player in the offshore energy sector and is committed to innovation and sustainability. However, COGL faces challenges in prioritizing maintenance activities and tracking risks for its Floating Production, Storage, and Offloading (FPSO) units. Current Business Intelligence (BI) tools lack a unified approach, hindering efficient decision-making. To address this, COGL aims to explore integrated BI tools tailored to end users' needs in work-prioritization and risk-tracking. These tools will consolidate data, providing a unified platform for analysis and visualization. Leveraging advanced analytics and predictive modeling will enable COGL to optimize maintenance activities and allocate resources effectively. By empowering stakeholders with actionable insights, COGL seeks to enhance operational efficiency and ensure the continued success of its offshore energy operations.

Stakeholders:

Directly Involved:

- Maintenance and Reliability Engineer
- Production/Process Engineers
- Technical Managers
- Operations/Asset Manager
- Installation Managers
- Superintendents (Maintenance, Production)
- PowerBI Developers

Indirectly Involved:

- Human Resources Manager

● Group Technical Authority ● Finance Manager

Name of Project Team	**Operation's Center of Excellence**
Name and position of the person authorizing (facilitator):	**Signature:**

9.6 Appendix 4: Preliminary Bibliographical Research

Abrahamsson, P., Salo, O., Ronkainen, J., & Warsta, J. (2017*). Agile software development methods: Review and analysis. arXiv preprint arXiv:1709.08439.*

****During the preparation of the project management plan, key components need to be considered since software development projects, whilst similar to other projects, require a different approach to project management.

Becker, L. T., & Gould, E. M. (2019). Microsoft Power BI: Extending excel to manipulate, analyze, and visualize diverse data. *Serials Review*, *45*(3), 184-188.

**** Understanding how data can be manipulated and visualized using Microsoft Power BI is critical since the platform was created with Business Intelligence in mind.

Božič, K., & Dimovski, V. (2019). Business intelligence and analytics for value creation: The role of absorptive capacity. International journal of information management, 46, 93-103.

****It is vital to understand why businesses require Business Intelligence tools to guide their strategy in managing and optimizing business outputs.

Butler, C. W., Vijayasarathy, L. R., & Roberts, N. (2020). Managing software development projects for success: Aligning plan-and agility-based approaches to project complexity and project dynamism. *Project Management Journal*, *51*(3), 262-277.

**** During the preparation of the project management plan, key components need to be considered since software development projects require more agile project management practices as compared to others.

Kerzner, H. (2018). Project management best practices: Achieving global excellence. John Wiley & Sons.

****During the preparation of the project management plan, key components need to be considered since software development projects, whilst similar to other projects, require a different approach to project management.

Kerzner, H. (2017). Project management: a systems approach to planning, scheduling, and controlling. John Wiley & Sons.

Mang, P., & Haggard, B. (2016). Regenerative development and design: A framework for evolving sustainability.

Nurcahyo, R., Darmawan, D., Jannis, Y., Kurniati, A., & Habiburrahman, M. (2018, December). Maintenance Planning Key Process Area: Case Study at Oil Gas Industry in Indonesia. In *2018 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)* (pp. 1704-1708). IEEE.

****Integrating reliability and maintenance concepts is critical to protecting the integrity of assets in the oil and gas sector. It is essential to understand how these concepts relate, how they are utilized, and which components will be valuable to the tool.

Project Business Academy (2020, August 18). What is the Project Lifecycle?. https://www.adeaca.com/blog/faq-items/what-is-the-project-lifecycle

Pudar, N., & Ivošević, Š (2022). USE OF AMOS IN THE SHIP MAINTENANCE OPTIMIZATION PROCESS.

****It is critical to understand how AMOS is used within the oil and gas sector since this is one of the tools on which a gap assessment will be conducted as part of the development of the BI tool.

Ramakrishnan, T., Khuntia, J., Kathuria, A., & Saldanha, T. J. (2020). An integrated model of business intelligence & analytics capabilities and organizational performance. Communications of the Association for Information Systems, 46(1), 31.

****Understanding what Business Intelligence is from an integrated approach can provide insights into what key components are required during the development phase and how these components will provide insights to the business.

Rowe, S. F. (2020). Project management for small projects. Berrett-Koehler Publishers.

Tang, Y., Liu, Q., Jing, J., Yang, Y., & Zou, Z. (2017). A framework for identification of maintenance significant items in reliability centered maintenance. Energy, 118, 1295-1303.

****The Business Intelligence tool will integrate reliability and maintenance concepts that are key to protecting the integrity of assets in the oil and gas sector. It is important to understand how these concepts relate, how they are utilized, and which components will be valuable to the tool.

Tidd, J., & Bessant, J. R. (2020). *Managing innovation: integrating technological, market and organizational change*. John Wiley & Sons.

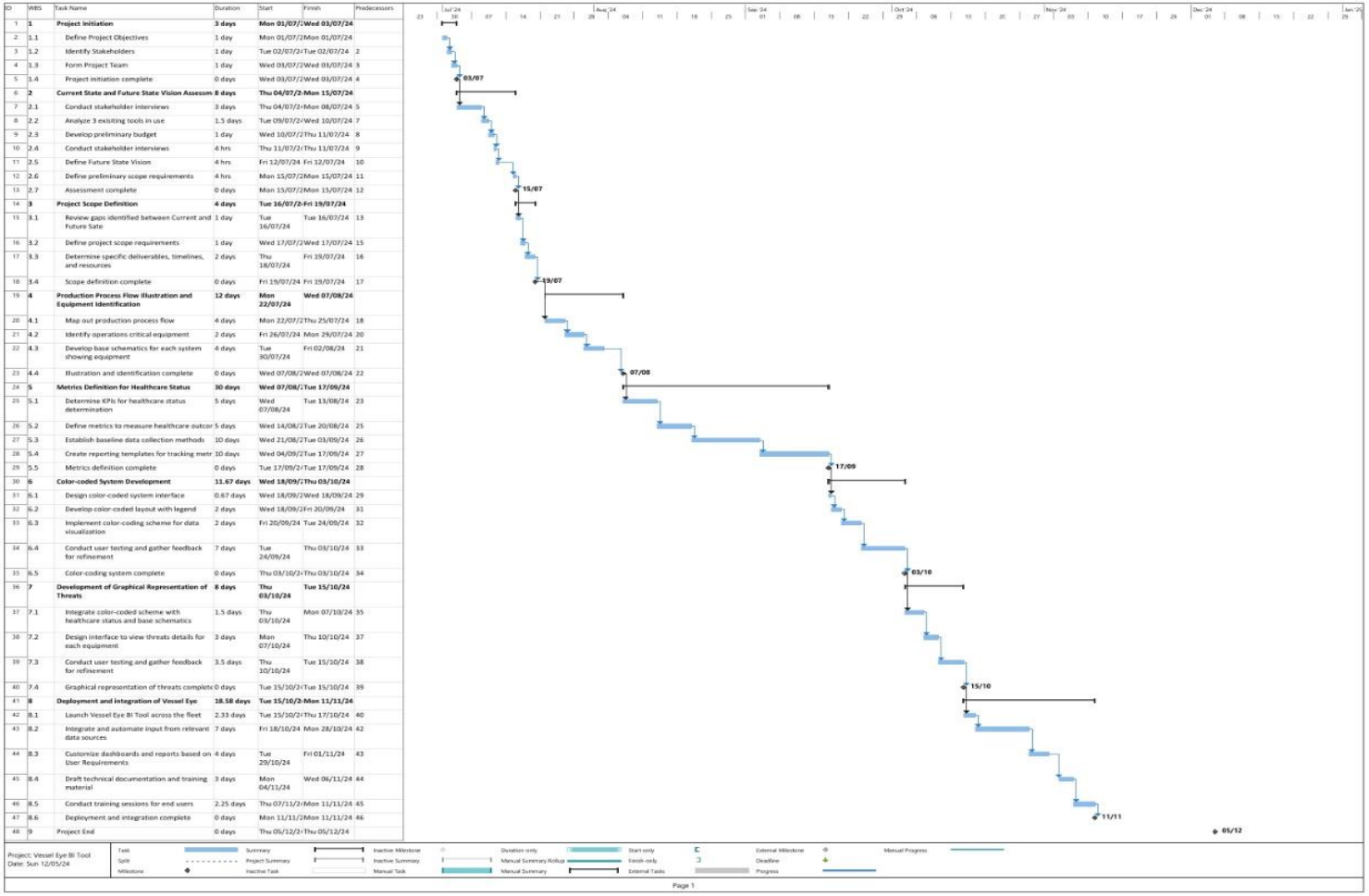
****Implementation of new software in organizations need to be done using change management. It is essential to understand how these changes may affect the organization and how best to manage them.

Trieu, V. H. (2017). Getting value from Business Intelligence systems: A review and research agenda. Decision Support Systems, 93, 111-124.

****Several best practices have been explored as it relates to the implementation of business intelligence tools. It is vital to review these approaches in order to tailor the best approach for this project.

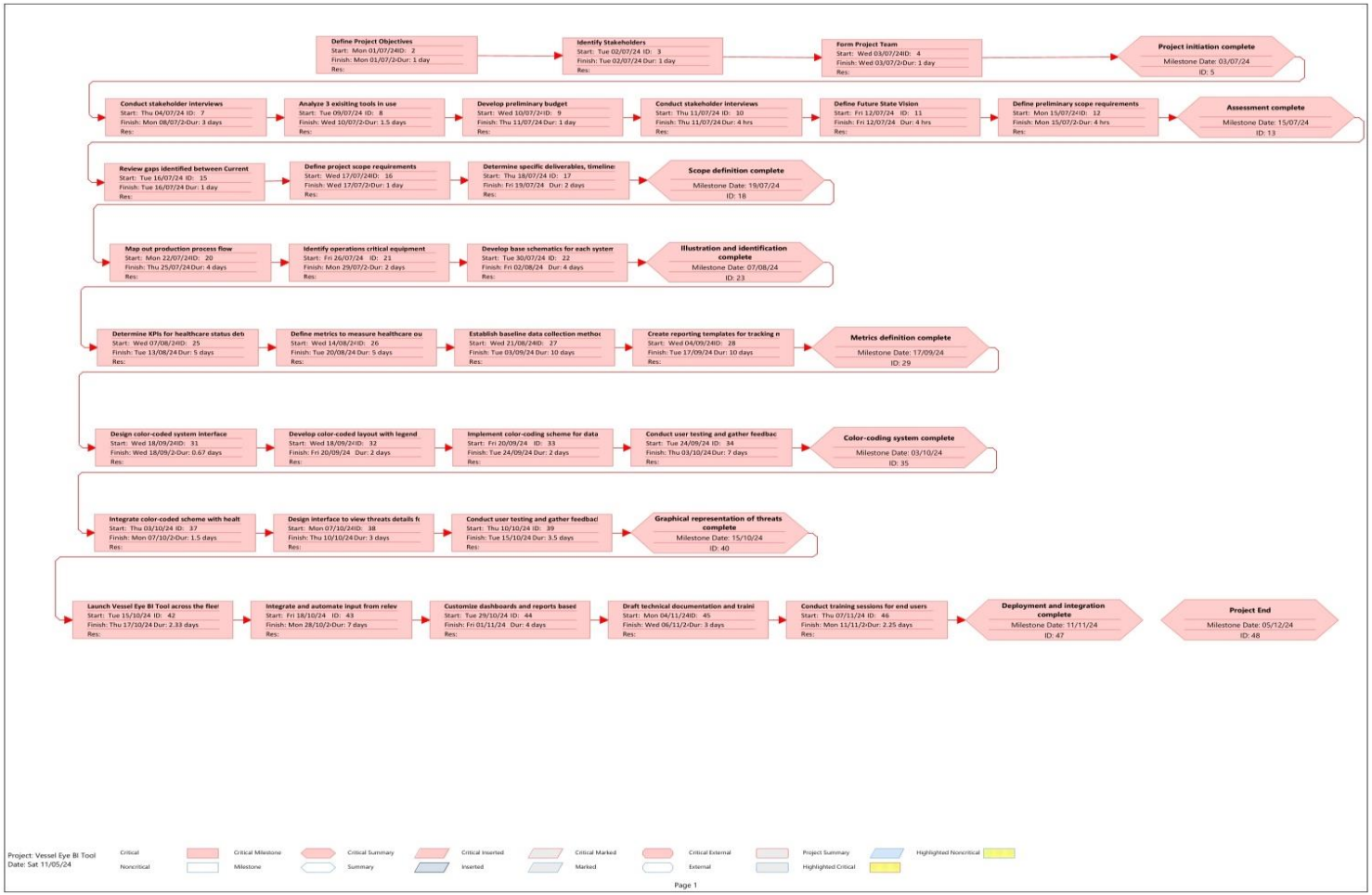
9.8 Appendix 5: Other Relevant Information

9.9 Appendix 6: Schedule Baseline Gantt Char



ID	WBS	Task Name	Duration	Start	Finish	Predecessors
1	1	**Project Initiation**	**3 days**	**Mon 01/07/2**	**Wed 03/07/24**	
2	1.1	Define Project Objectives	1 day	Mon 01/07/2	Mon 01/07/24	
3	1.2	Identify Stakeholders	1 day	Tue 02/07/2	Tue 02/07/24	2
4	1.3	Form Project Team	1 day	Wed 03/07/2	Wed 03/07/24	3
5	1.4	Project initiation complete	0 days	Wed 03/07/2	Wed 03/07/24	4
6	2	**Current State and Future State Vision Assessm**	**8 days**	**Thu 04/07/2**	**Mon 15/07/24**	
7	2.1	Conduct stakeholder interviews	3 days	Thu 04/07/2	Mon 08/07/24	5
8	2.2	Analyze 3 exisiting tools in use	1.5 days	Tue 09/07/2	Wed 10/07/24	7
9	2.3	Develop preliminary budget	1 day	Wed 10/07/2	Thu 11/07/24	8
10	2.4	Conduct stakeholder interviews	4 hrs	Thu 11/07/2	Thu 11/07/24	9
11	2.5	Define Future State Vision	4 hrs	Fri 12/07/24	Fri 12/07/24	10
12	2.6	Define preliminary scope requirements	4 hrs	Mon 15/07/2	Mon 15/07/24	11
13	2.7	Assessment complete	0 days	Mon 15/07/2	Mon 15/07/24	12
14	3	**Project Scope Definition**	**4 days**	**Tue 16/07/2**	**Fri 19/07/24**	
15	3.1	Review gaps identified between Current and Future Sate	1 day	Tue 16/07/24	Tue 16/07/24	13
16	3.2	Define project scope requirements	1 day	Wed 17/07/2	Wed 17/07/24	15
17	3.3	Determine specific deliverables, timelines, and resources	2 days	Thu 18/07/24	Fri 19/07/24	16
18	3.4	Scope definition complete	0 days	Fri 19/07/24	Fri 19/07/24	17
19	4	**Production Process Flow Illustration and Equipment Identification**	**12 days**	**Mon 22/07/24**	**Wed 07/08/24**	
20	4.1	Map out production process flow	4 days	Mon 22/07/2	Thu 25/07/24	18
21	4.2	Identify operations critical equipment	2 days	Fri 26/07/24	Mon 29/07/24	20
22	4.3	Develop base schematics for each system showing equipment	4 days	Tue 30/07/24	Fri 02/08/24	21
23	4.4	Illustration and identification complete	0 days	Wed 07/08/2	Wed 07/08/24	22
24	5	**Metrics Definition for Healthcare Status**	**30 days**	**Wed 07/08/**	**Tue 17/09/24**	
25	5.1	Determine KPIs for healthcare status determination	5 days	Wed 07/08/24	Tue 13/08/24	23
26	5.2	Define metrics to measure healthcare outcor	5 days	Wed 14/08/2	Tue 20/08/24	25
27	5.3	Establish baseline data collection methods	10 days	Wed 21/08/2	Tue 03/09/24	26
28	5.4	Create reporting templates for tracking metr	10 days	Wed 04/09/2	Tue 17/09/24	27
29	5.5	Metrics definition complete	0 days	Tue 17/09/2	Tue 17/09/24	28
30	6	**Color-coded System Development**	**11.67 days**	**Wed 18/09/**	**Thu 03/10/24**	
31	6.1	Design color-coded system interface	0.67 days	Wed 18/09/2	Wed 18/09/24	29
32	6.2	Develop color-coded layout with legend	2 days	Wed 18/09/2	Fri 20/09/24	31
33	6.3	Implement color-coding scheme for data visualization	2 days	Fri 20/09/24	Tue 24/09/24	32
34	6.4	Conduct user testing and gather feedback for refinement	7 days	Tue 24/09/24	Thu 03/10/24	33
35	6.5	Color-coding system complete	0 days	Thu 03/10/2	Thu 03/10/24	34
36	7	**Development of Graphical Representation of Threats**	**8 days**	**Thu 03/10/24**	**Tue 15/10/24**	
37	7.1	Integrate color-coded scheme with healthcare status and base schematics	1.5 days	Thu 03/10/24	Mon 07/10/24	35
38	7.2	Design interface to view threats details for each equipment	3 days	Mon 07/10/24	Thu 10/10/24	37
39	7.3	Conduct user testing and gather feedback for refinement	3.5 days	Thu 10/10/24	Tue 15/10/24	38
40	7.4	Graphical representation of threats complete	0 days	Tue 15/10/2	Tue 15/10/24	39
41	8	**Deployment and integration of Vessel Eye**	**18.58 days**	**Tue 15/10/2**	**Mon 11/11/24**	
42	8.1	Launch Vessel Eye BI Tool across the fleet	2.33 days	Tue 15/10/2	Thu 17/10/24	40
43	8.2	Integrate and automate input from relevant data sources	7 days	Fri 18/10/24	Mon 28/10/24	42
44	8.3	Customize dashboards and reports based on User Requirements	4 days	Tue 29/10/24	Fri 01/11/24	43
45	8.4	Draft technical documentation and training material	3 days	Mon 04/11/24	Wed 06/11/24	44
46	8.5	Conduct training sessions for end users	2.25 days	Thu 07/11/2	Mon 11/11/24	45
47	8.6	Deployment and integration complete	0 days	Mon 11/11/2	Mon 11/11/24	46
48	9	Project End	0 days	Thu 05/12/2	Thu 05/12/24	

9.10 Appendix 7: Schedule Network Diagram



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Yetunde Grant
Literacy/Linguistics/Language Studies Educator
Certified by the Cyril Potter College of Education

May 25, 2024

Mr. Róger Valverde Jiménez
Academic Advisor
Master's Degree in Project Management (MPM)
Universidad para la Cooperacion Internacional (UCI)

Dear Mr. Valverde,

RE: Request for Philologist's Review

The subsequent declaration is issued in response to a request for a comprehensive review and proofreading of the Final Graduation Project titled "Revolutionizing Oil and Gas Maintenance: A Project Management Plan for Unleashing Smart Business Intelligence (BI) for Enhanced Work Prioritization and Risk-Tracking," submitted by Ashford Leroy Thom in partial fulfillment of the requirements for the Master's Degree in Project Management.

I hereby confirm that the student has made all of the corrections to the Final Graduation Project document, as I have advised. In my opinion, the document now meets the literary and linguistic standards expected of a student for a degree at the Master's level.

Sincerely,

DocuSigned by:
Y. Grant
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5/25/2024

Yetunde Grant

DocuSign

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Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

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Notary Events	Signature	Timestamp

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