UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL
(UCI)

PROJECT MANAGEMENT PLAN FOR THE OPTIMIZATION OF STAFFING FOR ST. LUCIA'S AIR TRAFFIC CONTROL UNITS

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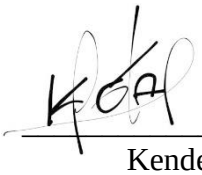

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Kendell Peter
STUDENT

DEDICATION

To my son, Joshua Peter,

May this paper serve as a testament to the enduring value of hard work and dedication. As you grow, my hope is that you find inspiration in the journey recounted within these pages. May it instill in you the belief that with perseverance and commitment, any summit can be conquered.

In memory of my late mother, Helen Peter,

To the woman whose influence shaped the very core of who I am today. Your unwavering support, boundless love, and enduring wisdom guide me still. This achievement is a reflection of the values you instilled in me and the strength you cultivated within my spirit. I carry your memory with me, always.

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I would like to express my heartfelt gratitude to my father, Dickson Peter, whose unwavering support and guidance have been the bedrock of my academic journey. His wisdom, encouragement, and the solid foundation he laid for me have been instrumental in shaping my pursuit of knowledge.

I am also deeply thankful to my wife, Ava Peter, whose unwavering support, patience, and understanding have been a source of strength throughout this challenging yet rewarding experience. Her belief in me and constant encouragement have been invaluable, making this academic endeavor a shared journey filled with love and companionship.

Both my father and wife have played pivotal roles in my success, and I am truly fortunate to have them by my side. Their support has been the driving force behind my achievements, and for that, I am profoundly grateful.

ABSTRACT

This project management plan outlines a comprehensive strategy for optimizing staffing at the Saint Lucia Air and Sea Ports Authority (SLASPA)'s air traffic control units. The project's core objective is to enhance operational efficiency and safety by aligning staffing levels with the dynamic demands of air traffic. The plan involves a detailed analysis of historical data to identify workload patterns, peak trafficc hours, and areas of high activity.

The project includes the development and implementation of a flexible staffing model, integrating advanced scheduling algorithms and real-time monitoring systems. These technologies will enable precise staff allocation during peak periods and efficient resource utilization during low-demand hours. Additionally, customized training programs will enhance the skills of existing staff and facilitate seamless onboarding of new personnel, ensuring alignment with industry best practices.

The benefits of this project are multifold. It will significantly enhance safety and accuracy in air traffic operations, reduce delays and congestion, optimize operational costs, and ensure compliance with national and international aviation regulations. Furthermore, the project will elevate stakeholder satisfaction by providing timely and reliable air traffic services.

By embracing this strategic initiative, SLASPA aims to establish a benchmark for operational excellence within the aviation industry. Through the implementation of this project, SLASPA's air traffic control unit will evolve into a model of efficiency, ensuring safer skies and unparalleled service for all stakeholders.

By focusing on needs assessment and stakeholder consultation as part of an overall qualitative and analytical approach, SLASPA's air traffic control units can systematically optimize staffing levels, ensuring the highest standards of safety, efficiency, and reliability in air traffic operations.

Keywords: air traffic control, staffing optimization, operational efficiency, safety enhancement

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ABBREVIATIONS AND ACRONYMS

- ANSP – Air Navigation Service Provider
- ATC – Air Traffic Control
- ICAO – International Civil Aviation Organization
- KPI – Key Performance Indicators
- SLASPA – Saint Lucia Air and Sea Ports Authority
- SMART – Specific, Measurable, Attainable, Realistic, Time-bound
- WBS – Work Breakdown Structure

EXECUTIVE SUMMARY

The Saint Lucia Air and Sea Ports Authority (SLASPA) serves as the vital core of Saint Lucia's transportation system, focusing on facilitating smooth movement of goods and people. As an essential Air Navigation Service Provider (ANSP), SLASPA manages air traffic, ensuring safety, efficiency, and precision within Saint Lucia's airspace. This responsibility encompasses air traffic control, meteorological services, and navigation aids. With skilled controllers and advanced technology, SLASPA coordinates aircraft arrivals, departures, and in-flight operations at key airports. Actively engaging with regional and international aviation bodies, SLASPA ensures standardized procedures, effective communication, and a collective commitment to aviation safety. Upholding stringent international standards, including those by the ICAO, SLASPA's role goes beyond managing air traffic; it encompasses safeguarding lives, driving economic growth, and bolstering Saint Lucia's reputation as a secure aviation hub, achieved through expertise, innovation, and an unwavering dedication to safety and precision.

St. Lucia's air traffic control system faces significant challenges due to the booming tourism industry and increasing air traffic, highlighting a critical shortage in staffing levels. The widening gap between demand and workforce jeopardizes safety, leading to errors, operational issues, stress, and inefficiencies. This situation not only compromises safety but also risks regulatory compliance, impacting St. Lucia's reputation as a secure aviation destination. To counter these challenges, there is an urgent need for a tailored project management plan focusing on workforce analysis, advanced training, technology integration, and strategic recruitment. Implementing this plan is crucial to enhancing safety, ensuring compliance, and preserving St. Lucia's status as a reliable aviation hub in the Caribbean.

A project management plan for optimizing staffing at an air traffic control unit provides a structured and systematic approach to achieve project objectives. It serves as a comprehensive document outlining project execution, monitoring, and control. The plan allocates resources efficiently, including personnel, training, technology, and budget, ensuring optimal staffing levels. It includes detailed schedules and milestones, minimizing disruptions to operations. The plan identifies and mitigates project-related risks, ensuring adaptability. Moreover, it sets quality standards, ensuring adherence to industry best practices and regulations for high-quality outcomes.

The objective is to create a detailed project management plan for optimizing staffing in St. Lucia's air traffic control units. This plan provides a structured roadmap, encompassing project scope, objectives, timelines, resources, risks, and quality standards. Specific goals include developing a project charter, scope, schedule, cost, quality, resource, communication, risk, procurement, and stakeholder management plans. Each plan establishes frameworks and guidelines for various project aspects, ensuring a systematic and coordinated approach from initiation to completion.

Both primary and secondary sources of information will be used in the development of this project. Primary sources will include original data such as personnel records, workforce surveys, and budgetary documents. Secondary sources will include interpretations and analyses of primary sources, including industry reports, academic journals, and case studies. The primary research methods used while developing this plan were the analytical

and quantitative methods. The analytical methods involved critical analysis of existing data using statistical and mathematical techniques, while the quantitative methods focused on non-numerical data, exploring attitudes, behaviors, and perceptions. Various tools such as expert judgment, data analysis, and decision-making processes assisted in project management tasks. There were assumptions which were accepted factors without proof, like stakeholder support and constraints which were limiting factors like time limitations and regulatory policies. Tangible or intangible products, like Project Charter or Risk Management Plan, were generated in various project phases.

Optimizing staffing in an air traffic control unit holds significant implications for regenerative and sustainable development. It contributes to environmental conservation by reducing the aviation industry's impact, enhances operational efficiency, ensures safety, fosters a positive work environment, drives technological advancements, and satisfies community needs. By ensuring smooth and efficient air traffic control operations, the project significantly benefits both the environment and the economy within the framework of sustainable development.

This project management plan outlines a comprehensive approach to optimize staffing within St. Lucia's Air Traffic Control Units, ensuring efficiency, safety, and stakeholder buy-in. It adheres to the Project Management Institute's framework, addressing key knowledge areas for project success while promoting sustainability through efficient planning, technological integration, and stakeholder collaboration.

This meticulously crafted project management plan for optimizing staffing at St. Lucia's Air Traffic Control Units encompasses key knowledge areas to enhance safety and efficiency while optimizing costs and fostering collaboration. It includes comprehensive plans for scope, schedule, cost, quality, risk, resources, communications, stakeholders, and procurement, ensuring clear objectives, coordinated efforts, and stakeholder engagement throughout the project lifecycle.

To optimize staffing, this project recommends continuous data analysis and scenario planning to forecast staffing needs, along with capacity building through recruitment, training, and retention. Dynamic scheduling and workload management, alongside fatigue risk management, are crucial for operational efficiency.

Successful implementation of this staffing optimization project requires key management plans, including a detailed project charter, an integration plan for a holistic approach, a scope management plan to prevent scope creep, and robust plans for schedule, cost, quality, resources, communication, risk, procurement, and stakeholder management.

1 INTRODUCTION

In the dynamic and high-stakes world of air traffic control, ensuring optimal staffing levels is paramount to the safety, efficiency, and smooth operation of air travel. The aviation industry, marked by its ever-increasing demand and complexity, necessitates a meticulous and adaptive approach to staffing. The challenges posed by retirements, increasing air traffic volumes, and the need for operational flexibility have led to a critical need for innovative solutions.

1.1. Background

The Saint Lucia Air and Sea Ports Authority (SLASPA) stands as the central nervous system of Saint Lucia's transportation infrastructure. Established with a mission to facilitate seamless movement of goods and people, SLASPA has played a pivotal role in the economic and social development of Saint Lucia.

The Saint Lucia Air and Sea Ports Authority (SLASPA) plays a pivotal role as an air navigation service provider (ANSP) in ensuring the safe, orderly, and efficient flow of air traffic within Saint Lucia's airspace. As the custodian of the nation's ports and airports, SLASPA extends its expertise to the critical domain of air navigation, where precision and safety are paramount.

As an ANSP, SLASPA is entrusted with the responsibility of managing the airspace over Saint Lucia. This involves providing air traffic control services, meteorological information, navigation aids, and other essential services that facilitate the movement of aircraft. By ensuring adherence to strict safety protocols and international aviation standards, SLASPA safeguards the lives of passengers and the integrity of the airspace.

SLASPA's air traffic management system operates on the principles of accuracy and efficiency. Experienced air traffic controllers, supported with technology, manage the intricate dance of arrivals, departures, and in-flight aircraft. By coordinating takeoffs and landings, managing air routes, and preventing collisions, SLASPA's air traffic management ensures seamless operations at Hewanorra International Airport and George F. L. Charles Airport.

As an active participant in regional and international aviation bodies, SLASPA collaborates with neighboring ANSPs, airlines, and regulatory authorities. This collaborative spirit ensures harmonized procedures, streamlined communication, and a collective commitment to enhancing air travel safety. Additionally, SLASPA's adherence to international standards, including those set by the International Civil Aviation Organization (ICAO), underscores its dedication to global aviation excellence (SLASPA, 2023).

SLASPA's role as an Air Navigation Service Provider is not merely about managing air traffic; it's about safeguarding lives, promoting economic growth, and upholding Saint Lucia's reputation as a reliable aviation hub. Through expertise, innovation, and a steadfast commitment to safety, SLASPA continues to navigate the skies, ensuring that every flight over Saint Lucia is a testament to precision, efficiency, and above all, safety.

1.2. Statement of the problem

In recent years, St. Lucia's air traffic control system has faced mounting challenges arising from the escalating demands of a thriving tourism industry, increasing air traffic, and the intricate intricacies of modern aviation regulations. As the island nation continues

to position itself as a key player in the Caribbean travel sector, the inadequacy of current staffing levels within its air traffic control units has emerged as a critical concern.

The tourism boom, coupled with St. Lucia's strategic location as a hub for international flights, has led to a significant surge in air traffic. However, the staffing levels within the air traffic control units have not kept pace with this growth. This widening gap between the demand for air traffic control services and the available workforce poses an imminent threat to the safety and efficiency of St. Lucia's airspace.

Insufficient staffing jeopardizes the safety of air travel, increasing the risk of errors and operational mishaps. Overburdened controllers face stress and fatigue, compromising their ability to make split-second decisions crucial for safe landings and takeoffs. Additionally, the strain on the existing workforce results in operational inefficiencies, leading to delays, miscommunications, and congestion in the airspace, negatively impacting the overall travel experience for passengers and airlines alike.

The inadequacy of staffing levels also raises concerns about regulatory compliance. Meeting international aviation standards requires a well-staffed, expertly trained workforce capable of handling complex air traffic scenarios (EuroControl, 2022). Failure to comply not only risks safety but also tarnishes St. Lucia's reputation as a reliable and secure aviation destination, potentially deterring airlines and tourists from choosing the island as their travel hub.

To address these pressing challenges, there is an urgent need to develop a comprehensive project management plan specifically tailored to optimize staffing within St. Lucia's air traffic control units. Such a plan should encompass meticulous workforce

analysis, advanced training initiatives, incorporation of cutting-edge technologies, and strategic recruitment strategies. By developing a robust project management plan, St. Lucia can bridge the staffing gap, enhance safety standards, ensure regulatory compliance, and bolster its reputation as a dependable aviation hub in the Caribbean.

1.3. Purpose

The purpose of using a project management plan to guide a project to optimize staffing at an air traffic control unit is to provide a structured, organized, and systematic approach to achieving the project's objectives. The plan provides a comprehensive and structured document that outlines how the project should be executed, monitored, controlled, and closed. It serves as a roadmap that guides the project team and stakeholders throughout the project lifecycle.

The plan identifies the resources required for the project, including personnel, training programs, technology, and budget. It ensures that the necessary resources are allocated efficiently to achieve optimal staffing levels. It includes detailed schedules, timelines, and milestones. It helps in planning the project activities, ensuring that staffing optimization processes are executed in a timely manner, minimizing disruptions to ongoing operations. The plan identifies potential risks related to the staffing optimization project. It outlines strategies to mitigate these risks, ensuring that the project can adapt to unexpected challenges effectively. defines the quality standards and criteria that the project deliverables must meet. It ensures that the staffing optimization processes adhere to industry best practices and regulatory requirements, promoting high-quality outcomes.

1.4. General objective

To develop a project management plan for optimizing the staffing of St. Lucia's Air Traffic Control Units.

1.5. Specific objectives

1. To develop a project charter to formally document the project's initiation.
2. To develop a scope management plan to ensure that the scope is well defined, controlled and aligned with the objectives of the project.
3. To develop a schedule management plan to establish a framework to guide the development, management and controlling of the project schedule.
4. To develop a cost management plan to establish a framework to plan, estimate, budget, control and monitor costs related to the project.
5. To develop a quality management plan to ensure that the deliverables of the project meet the required quality standards and objectives.
6. To develop a resource management plan to establish a framework for identifying, acquiring, allocating and managing the resources required for the project.
7. To develop a communication management plan to establish a framework to plan, execute, monitor and control project communications.
8. To develop a risk management plan to establish a framework to identify, assess, mitigate and manage risks within the project.
9. To develop a procurement management plan to establish a framework for planning, executing and controlling all procurement-related activity within the project.

10. To develop a stakeholder management plan to establish a framework for identifying, analyzing, engaging, and managing stakeholders throughout the project.

2 THEORETICAL FRAMEWORK

The theoretical framework for the project to optimizing the staffing at the air traffic control units in St. Lucia guides and informs every aspect of the project. It connects theory and practice, and links concepts, principles and ideas to support and highlight the projects objectives. The framework also establishes the Saint Lucia Air and Sea Ports Authority as the facilitator of the project and shows how the project aligns with the objectives of the authority.

2.1 Company/Enterprise framework

A company's enterprise or framework refers to the overall structure, strategies, processes, and systems that govern its operations. It encompasses the organization's core elements, including its mission, vision, goals, policies, procedures, culture, technology, and human resources. It provides a holistic view of the company's structure and how it operates. It serves as a guide for employees, stakeholders, and partners, ensuring that everyone is aligned with the company's mission and working toward common objectives.

2.1.1 Company/Enterprise background

The Saint Lucia Air and Sea Ports Authority (SLASPA) is a statutory corporation of the Government of Saint Lucia. It was established as an entity by an act of parliament in 1983. The act amalgamated the Saint Lucia Port Authority and the Civil Aviation Department of Ministry of Communication and Works. The origins of the organization trace even further back, to the early 1970s, when it was recognized that there was need for a central authority to manage Saint Lucia’s seaports and airports efficiently.

SLASPA is the guardian of the island's trade and transportation infrastructure. It oversees and develops the nation's ports, airports, and related services. SLASPA has played, and continues to play, a pivotal role in shaping the island's connectivity, trade, and economic growth (SLASPA, 2023).

2.1.2 **Mission and vision statements**

The current mission statement for the Saint Lucia Air and Sea Ports Authority is "To facilitate trade and travel through value creation in a safe, secure and customer-centric environment for sustained social and economic development." This mission aligns closely with a project to optimize staffing at the country's air traffic control units. Safety, security, efficiency and customer satisfaction in the air traffic control service are all critical elements that contribute to the seamless operation of the air navigation system. This, in turn, contributes to smooth air travel which is vital to trade, travel and economic development. Optimizing staffing at air traffic control units will contribute towards air traffic control role in the organization towards fulfilling the mission and the success of the aviation sector, as well as the overall economy.

SLASPA's vision statement is "To be a modern gateway connecting people, partners and the world." Optimizing air traffic control staffing directly contributes to this vision by ensuring that the air traffic control unit can meet the demands of modern aviation, efficiently connect people and partners, and play a pivotal role in global connectivity through safe and efficient air travel. It aligns with the broader goal of advancing the capabilities of the air traffic control system to serve as a vital link in the global transportation network which connect Saint Lucia to the rest of the world (SLASPA, 2023).

2.1.3 **Organizational structure**

SLASPA is managed by a government-appointed board of directors, which is called the Ports Council and a senior management team, led by the General Manager/Chief Executive Officer.

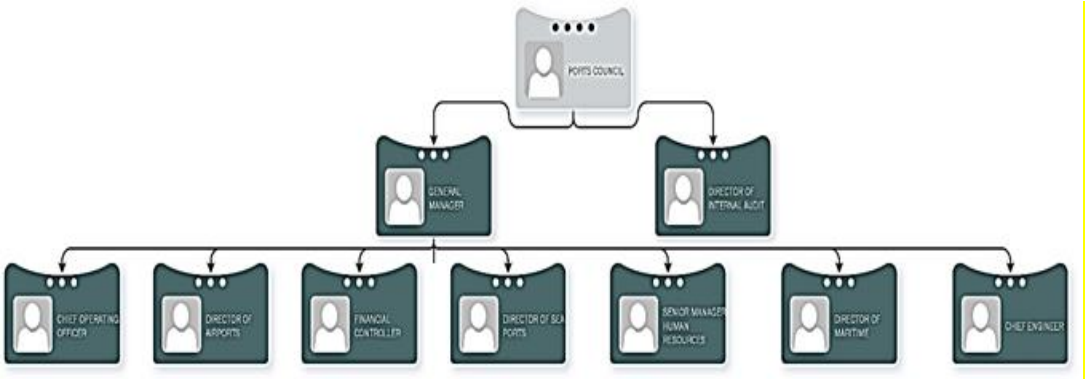
The executive arm of the government, in particular the prime minister, sets policy and SLASPA, through its management structure, implements government policies.

The Council is chaired by the Permanent Secretary in the Ministry of Finance. The Deputy Chairperson is the Permanent Secretary in the Ministry of Communications and Works. There are eight other members of the Council, representing public and private sector interests related to the business of SLASPA, all appointed by the government,

The Senior Management team is comprised of seven department heads, as well as the General Manager and the Director of Internal Audit. The relevant department that is responsible for air traffic control services is the Airports Department, which is led by the Director of Airports. The Director of Airports current forms part of Executive Management. The organization's structure as of January 2024 is reflected in Figure 1.

Figure 1

SLASPA's Organizational structure



Note: This figure shows the organizational structure of SLASPA as of January 2024. Source: Project Operations Manual CATCOP-SL (2024). With permission

Products offered

The Saint Lucia Air and Sea Ports Authority (SLASPA) offers a range of products and services related to the management and operation of seaports and airports in Saint Lucia. These products and services are integral to ensuring the smooth flow of goods and people through the nation's air and sea gateways.

Seaport and airport operations: SLASPA manages two airports and two seaports. They provide a variety of services, including passenger handling, cargo services, cruise services and aircraft services. Efficient airport operations are dependent on well-coordinated air traffic control services. Optimized air traffic control staffing ensures that aircraft movements, landings, and takeoffs are managed seamlessly, reducing delays and enhancing airport operations.

Air traffic control services: SLASPA's air traffic control services involve monitoring and managing the movement of aircraft within the country's airspace, ensuring safety, efficiency, and compliance with international aviation standards. The core of the project is to optimize air traffic control staffing, which directly impacts the quality and reliability of air traffic control services. Adequate staffing levels are essential for maintaining safe and efficient air traffic management.

Safety and security: SLASPA places a strong emphasis on safety and security at its airports and seaports. This includes security screening, surveillance, and emergency response services. Safety is a paramount concern in aviation. Proper ATC staffing levels

ensure that controllers can effectively respond to emergencies, manage air traffic during adverse weather conditions, and maintain the highest safety standards.

Cargo handling and logistics: SLASPA oversees cargo handling and logistics services at its seaports and airports, facilitating the movement of goods in and out of Saint Lucia. Efficient ATC staffing contributes to the timely arrival and departure of cargo flights, reducing potential bottlenecks in the supply chain and supporting trade facilitation.

Business development and marketing: SLASPA engages in business development and marketing efforts to attract airlines, shipping lines, and other stakeholders to utilize Saint Lucia's air and seaports. Optimized ATC staffing ensures that airlines and operators experience reliable and efficient services, which, in turn, enhances Saint Lucia's attractiveness as a transportation hub.

2.2 Project Management concepts

Project managers use project management concepts as a foundation to plan, execute, and deliver successful projects while meeting stakeholder expectations and managing constraints effectively. By applying project management concepts, project managers are well-equipped to lead their teams and navigate the complexities of project execution. They ensure that projects are delivered successfully, on time, within budget, and to the satisfaction of stakeholders, all while managing constraints effectively.

2.2.1 Project management principles

Stewardship refers to managing something that has been entrusted to an individual responsibly. Stewards display this responsibility by carrying out the activities that have been entrusted to them with integrity, care and trustworthiness. In addition, they must

compliance with internal, as well as, external guidelines. Stewards exhibit a commitment to financial, social and environmental impacts of the projects that they collaborate on (PMI, 2021).

Stewardship, in the context of a project to optimize staffing in an air traffic control unit, emphasizes responsible and ethical management of resources, including personnel, budget, and regulatory compliance. It ensures that staffing changes are made with a long-term view of safety, efficiency, and sustainability, while also considering the well-being of the air traffic control personnel and the broader social and environmental impacts.

In project management, teams are expected to be composed of individuals with backgrounds that reflect varying skills, knowledge and experience. Teams are expected to work collaboratively towards a unified goal. It is the expectation that the characteristics of the team will contribute to success more effectively than individuals (PMI, 2021).

The team concept is integral to the success of a project to optimize staffing in an air traffic control unit. It encompasses the collaborative efforts of project teams, air traffic control personnel, and change management teams to ensure that staffing changes are implemented smoothly while maintaining safety, reliability, and effective teamwork within the air traffic control unit.

Stakeholders need to be engaged in an effective and proactive manner to ensure that they contribute towards the success of the project. The influence of stakeholders should not be underestimated as they can influence projects, their performance and outcomes (PMI, 2021).

The stakeholders in a project to optimize staffing in an air traffic control unit are diverse and have multiple interests. Effective stakeholder management involves identifying, engaging, and addressing the interests and concerns of these parties to ensure that the project achieves its goals while maintaining safety, efficiency, and regulatory compliance in air traffic control operations.

As the project progresses, it is important to ensure that the project is continually evaluated to ensure that the project continues to remain aligned to its objectives and its intended benefits and value is realized (PMI, 2021).

A focus on value in a project to optimize staffing in an air traffic control unit means prioritizing safety, efficiency, cost-effectiveness, customer satisfaction, compliance, adaptability, sustainability, and stakeholder alignment. By delivering value in these areas, the project can achieve its goals while maintaining and improving the quality of air traffic control operations.

In order for the project to be successful, it must be tailored to its specific context. The project framework should be tailored and adapted so as to ensure a higher probability of a successful outcome (PMI, 2021).

Tailoring is essential for aligning project management practices with the specific requirements, complexities, and stakeholders of an air traffic control staffing optimization project. By customizing the project approach, project managers can enhance the project's effectiveness, efficiency, and overall success while maintaining safety and compliance with industry standards.

2.2.2 **Project management domains**

The stakeholder performance domain concerns activities and functions associated with stakeholders. Stakeholders typically determine the success or failure of a project. This domain focusses on ensuring that effective working relationships are cultivated with stakeholders so that their needs, preferences, priorities and points of view can be integrated into the project.

The stakeholder performance domain integrates seamlessly into a project to optimize staffing in an air traffic control unit by emphasizing the importance of identifying, engaging, and managing stakeholders effectively. It ensures that stakeholder needs and expectations are considered throughout the project life cycle, ultimately contributing to the successful implementation of staffing changes while maintaining safety, efficiency, and stakeholder satisfaction.

The team performance domain focuses on activities and functions of the collective of individuals who have been given the responsibility to produce the deliverables that are associated with the project in order to achieve the project objectives. This domain highlights collective responsibility amongst the team and is characterized by conflict management, team growth and monitoring of team interactions.

The team performance domain ensures that the project team working on air traffic control staffing optimization functions cohesively, communicates effectively, resolves conflicts, adapts to changes, and strives for continuous improvement. A high-performing project team is better equipped to navigate the complexities of staffing optimization and

deliver successful results while maintaining safety and efficiency in air traffic control operations.

The development approach and life cycle domain concerns activities and functions of the development approach, cadence, and life cycle phases of a project and how they contribute towards the project's outcomes.

The development approach and life cycle domain integrate into a project to optimize staffing in an air traffic control unit by guiding project managers in selecting the most appropriate development approach and life cycle model, tailoring them to project requirements, and facilitating flexibility, adaptability, and continuous improvement. This integration ensures that the project aligns with the chosen approach and effectively addresses the unique challenges of staffing optimization in air traffic control operations.

The planning performance domain is concerned with the organization, processing and coordination of work during the project. It addresses functions and activities related to the initial, ongoing and evolving organization, processing and coordination necessary for the project's deliverables and outcomes to be realized.

The planning performance domain is integral to a project to optimize staffing in an air traffic control unit. It guides project managers in defining project objectives, developing detailed plans, allocating resources effectively, managing risks, and ensuring compliance with regulations. All of these conditions are essential for the successful execution of staffing optimization initiatives while maintaining safety and efficiency in air traffic control operations.

The project work performance domain focuses on the activities and functions that are related to the establishment of project processes, management of physical resources, and fostering a learning environment. It defines processes and execution of work to enable the team to create value and achieve the expected results. This includes communication, engagement, resource management, procurement and other activities to run project operations smoothly.

The project work performance domain is central to the successful execution of a project to optimize staffing in an ATC unit. It encompasses the practical implementation of staffing changes, resource management, quality assurance, change management, ongoing risk assessment, communication with stakeholders, monitoring of progress, and compliance with regulations. Effective execution within this domain is essential for achieving the project's goals while maintaining safety and efficiency in air traffic control operations.

The delivery performance domain focuses on activities and functions associated with delivery of the scope and quality that the project was conceived to achieve. It deals with the processes to complete the deliverables and meet the project objectives, while respecting the scope and quality requirements.

The delivery domain in project management ensures the successful transition from project execution to operational use. It encompasses activities related to the final implementation of staffing changes, training and skill development, transition planning, quality assurance, stakeholder communication, performance evaluation, and project closure. Effective delivery is crucial for realizing the benefits of staffing optimization while maintaining safety and efficiency in air traffic control operations.

The measurement performance domain involves assessing project performance and initiating optimal performance when it necessary to do so, in order to maintain optimal performance.

The measurement performance domain is essential in a project to optimize staffing in an air traffic control unit as it provides the tools and processes for assessing project progress, ensuring that key performance indicators are met, making data-driven decisions, and continuously improving project performance. It helps project managers and stakeholders stay informed, adapt to changing circumstances, and ultimately achieve the project's objectives while maintaining safety and efficiency in air traffic control operations.

The uncertainty performance domain deals with activities and functions related to risk and uncertainty. All projects exist in environments with varying degrees of uncertainty. Uncertainty presents both threats and opportunities that need to be explored, assessed, and handled.

The uncertainty performance domain is an integral part of a project to optimize staffing in an air traffic control unit. It ensures that potential uncertainties and risks are systematically identified, assessed, and managed throughout the project life cycle. Effective uncertainty management helps project managers and teams navigate challenges, maintain safety and efficiency in air traffic control operations, and ultimately achieve project objectives.

2.2.3 **Predictive, adaptative and hybrid projects**

Predictive, adaptive, and hybrid project management approaches have distinct characteristics and are suited to different types of projects.

Some of the main features of Predictive projects include:

- Sequential and linear project phases.
- Well-defined project scope and requirements upfront.
- Detailed project planning conducted at the beginning of the project.
- Limited flexibility to accommodate changes in requirements.
- Emphasis on comprehensive documentation and formal processes.
- Progress is monitored against a predefined project plan.
- Suited for projects with stable and well-understood requirements.

A predictive approach may not be ideal for an air traffic control staffing optimization project, as it assumes well-defined requirements. Such a project is likely to dynamic factors like changing air traffic patterns making requirements less stable.

Some of the main features of adaptive projects include:

- Iterative and incremental development cycles.
- Continuous feedback and collaboration with stakeholders.
- Emphasis on adapting to changing requirements.
- Flexibility to accommodate evolving project needs.
- Focus on delivering value early and frequently.
- Decentralized decision-making and empowered teams.
- Well-suited for projects with evolving or unclear requirements.

An adaptive approach aligns better with an air traffic control staffing optimization project because it accommodates changing requirements and encourages collaboration with stakeholders. Air traffic control operations can be influenced by various factors, and an adaptive approach allows for adjustments in staffing as needed.

Some of the main features of hybrid projects include:

- Combines elements of both predictive and adaptive approaches.
- Tailored project management practices based on project characteristics.
- Flexibility to apply predictive methods for certain aspects and adaptive methods for others.
- Customization of project processes to meet specific needs.
- Suitable for projects with a mix of stable and evolving requirements.

A hybrid approach could be a suitable choice for an ATC staffing optimization project. While some aspects, such as regulatory compliance and safety protocols, may require a predictive approach, other aspects, like adapting to changing air traffic patterns or technology advancements, could benefit from an adaptive approach. The hybrid approach allows for flexibility while maintaining necessary structure and compliance.

2.2.4 **Project management**

Project management is the practice of planning, executing, controlling, and closing a project to achieve specific goals and meet predefined success criteria. It involves the application of knowledge, skills, tools, and techniques to effectively manage and coordinate all project-related activities. The primary objectives of project management are to ensure

that projects are completed within scope, on time, within budget, and with the desired level of quality. Project management is applied in various industries and sectors. It is a structured and systematic approach to achieving project success and is often guided by established project management methodologies and frameworks.

2.2.5 **Project management knowledge areas and processes**

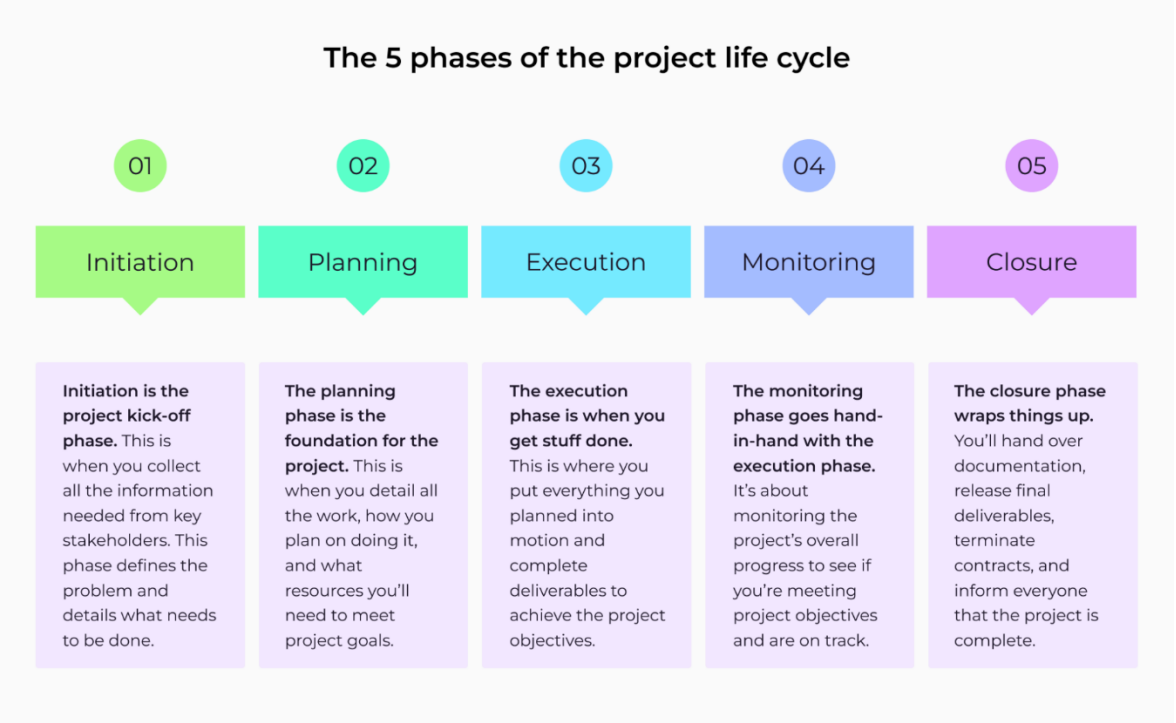
Project management knowledge areas are specific areas of expertise and focus within the field of project management. They represent the key functions and areas of knowledge that a project manager and their team need to effectively plan, execute, monitor, and control a project. There are ten project management knowledge areas.

2.2.6 **Project life cycle**

The predictive project lifecycle, also known as the traditional project management lifecycle, is a project management approach that follows a well-defined and sequential series of phases. It is often used in projects where the scope, requirements, and objectives are well-understood and relatively stable from the outset. The predictive project lifecycle is characterized by its structured and linear nature, with each phase building upon the previous one. The most common model for the predictive project lifecycle is the Waterfall model, which consists of the following sequential phases:

Figure 2:

Project Life Cycle

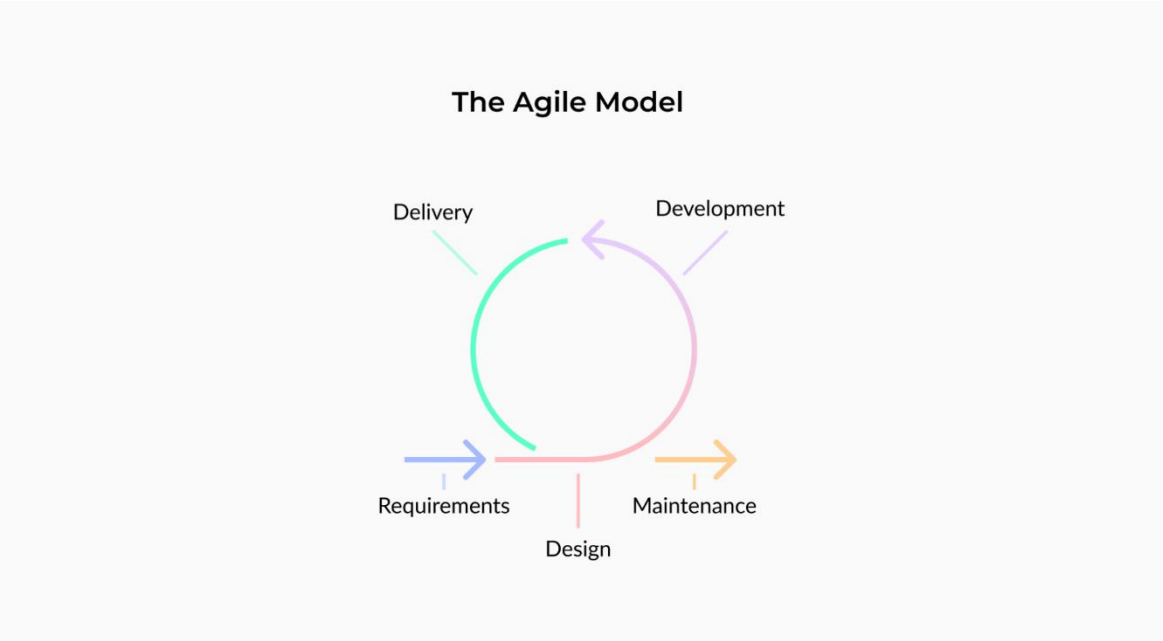


Note: This figure shows the project life cycle. Adapted from Resource Guru. Permission not sought.

The adaptive project lifecycle, also known as the Agile project lifecycle, is a project management approach characterized by its flexibility, iterative nature, and focus on responding to changing requirements and customer feedback. It is particularly well-suited for projects where the requirements are not fully known or may evolve over time.

Figure 3

The Agile Model



Note: This figure shows the agile model. Adapted from Resource Guru. Permission not sought

The hybrid project lifecycle is a project management approach that combines elements of both traditional (predictive) and Agile methodologies to suit the specific needs and characteristics of a project. In essence, it represents a middle ground between the structured, plan-driven approaches of traditional project management and the flexible, adaptive approaches of Agile project management. Hybrid project management aims to leverage the strengths of each approach while mitigating their respective weaknesses.

2.2.7 **Company strategy, portfolios, programs and projects**

The Saint Lucia Air and Sea Ports Authority’s strategy outlines its long-term vision and goals for air and sea transportation in Saint Lucia. It’s strategy is typically focused on its role as the primary operator of Saint Lucia's ports, encompassing both air and sea facilities. The specifics of its strategy includes objectives relating to safety, operational efficiency, customer satisfaction, and economic development centered around the airports and seaports. SLASPA's strategy emphasizes enhancing safety and efficiency. A staffing optimization project should result in establishing and maintaining adequate personnel levels to meet safety standards while also streamlining operations.

Portfolios in SLASPA represent a collection of related projects and programs that contribute to achieving specific organizational objectives. Within the context of optimizing staffing at an air traffic control unit, the staffing optimization project can be considered a part of a broader portfolio focused on operational excellence or safety enhancement.

Programs within SLASPA encompass a group of interrelated projects and initiatives aimed at achieving specific outcomes. In the context of optimizing staffing at an air traffic control unit, there may be a program dedicated to improving air traffic management or enhancing air traffic control services.

SLASPA must ensure integration and alignment across its strategy, portfolios, programs, and projects. This should directly contribute to the goals outlined in SLASPA's strategy.

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

Resource Management: Efficiently allocating human resources to ensure safety and operational effectiveness within an ATC unit is a central concept. This involves understanding staffing needs, optimizing work shifts, and ensuring a balance between demand and capacity (ICAO, 2018).

Human Factors in Aviation: Human factors theory addresses the impact of human behavior, cognition, and performance on safety and efficiency in aviation. In the context of ATC staffing optimization, this theory helps in designing work schedules and staffing levels that consider human factors such as fatigue, stress, and workload (ICAO, 2018).

Staffing Models: Various staffing models exist to determine the optimal number of ATC personnel required to meet operational demands. These models take into account factors like traffic volume, airspace complexity, and safety requirements to define staffing levels (ICAO, 2018).

Regulatory Compliance: Compliance with aviation regulations and standards, such as those set by the International Civil Aviation Organization (ICAO) and national aviation authorities, is critical. Concepts related to regulatory compliance guide staffing decisions to meet safety and legal requirements (ICAO, 2018).

Workforce Planning: Workforce planning involves analyzing current staffing levels, forecasting future needs, and developing strategies to address gaps. It considers factors like retirements, turnover, and training requirements (ICAO, 2018).

Workload Analysis: Understanding the workload patterns and peak traffic hours in an ATC unit is essential for optimal staffing. Concepts related to workload analysis help in scheduling and allocating staff effectively during high-demand periods (ICAO, 2018).

Safety Culture: A strong safety culture is crucial in aviation. Staffing optimization should consider safety culture concepts, emphasizing the importance of adequate staffing to maintain safety standards and reporting mechanisms for safety concerns (ICAO, 2018).

Change Management: Implementing staffing changes within an ATC unit requires effective change management principles. Concepts related to change management help in addressing resistance to change and ensuring a smooth transition (ICAO, 2018).

Risk Management: Risk management principles are applicable in identifying and mitigating potential risks associated with staffing changes. It involves assessing the impact of changes on safety, efficiency, and regulatory compliance (ICAO), 2018).

Quality Assurance: Maintaining the quality of ATC services is vital. Concepts related to quality assurance ensure that staffing changes do not compromise the quality of services provided (ICAO, 2018).

Performance Metrics: Establishing key performance indicators (KPIs) and metrics helps in monitoring the impact of staffing changes. Concepts related to performance measurement provide a framework for evaluating the project's success (ICAO, 2018).

Lean Principles: Lean principles aim to eliminate waste and optimize processes. In the context of staffing optimization, Lean concepts help in streamlining operations, reducing unnecessary tasks, and improving efficiency (ICAO, 2018).

Cost-Benefit Analysis: Evaluating the costs and benefits of staffing changes is essential. Concepts related to cost-benefit analysis assist in making informed decisions about staffing levels and resource allocation (ICAO, 2018).

Team Dynamics: Understanding team dynamics and collaboration within an ATC unit is crucial. Concepts related to team dynamics help in fostering effective teamwork and communication among ATC personnel (ICAO, 2018).

Continuous Improvement: The concept of continuous improvement encourages ongoing enhancements in staffing processes and procedures based on lessons learned and feedback (ICAO, 2018).

2.3.1 Current situation of the problem or opportunity in study

A shortage of air traffic controllers has arisen in Saint Lucia due to several factors:

Retirements and attrition: A significant number of experienced air traffic controllers have reached retirement age and have chosen to retire. Others have chosen to leave for other opportunities. This has led to a loss of skilled personnel.

Increased air traffic: The airport has experienced a surge in air traffic due to its growing popularity as a travel hub. The demand for air traffic control services has outpaced the recruitment and training of new controllers.

Training and recruiting delays: The training process for new air traffic controllers takes time, often several years, and there have been delays in the recruitment and training pipeline. This has resulted in fewer qualified controllers available for duty.

2.3.2 Previous research done for the topic in study

The shortage of air traffic controllers has been a concern in the aviation industry globally. Various research studies and reports have been conducted to understand the causes, implications, and potential solutions for this shortage.

There were four main causes of the shortage in other jurisdictions. They were the retirement wave, complex training requirements, and global increase in air traffic.

2.3.3 Other theory related to the topic in study

The shortage of ATCOs poses serious safety risks due to the potential for increased fatigue and stress among the existing workforce. Fatigue among air traffic controllers is a well-documented issue that can impair attention, memory, and decision-making, ultimately increasing the risk of errors (Bongo & Seva, (2021). Overworked ATCOs who are forced to work extended shifts are more likely to experience reduced situational awareness, which is critical in high-stakes environments such as air traffic control, where errors can have severe consequences.

Operational efficiency is another consequence. Shortages in air traffic control personnel can significantly impact the efficiency of air traffic operations. With fewer controllers available, airports and airspace sectors are more likely to face bottlenecks, resulting in flight delays and inefficient routing of aircraft. This inefficiency not only affects airport operations but also has a ripple effect on the entire aviation network (Kamat & Li, 2024).

Impact on the airline community is another major consideration. The airline community also suffers from the effects of ATCO shortages. Delays caused by understaffed ATC units

increase the operational costs for airlines, including higher fuel consumption, increased crew costs, and logistical disruptions. These inefficiencies not only impact individual airlines but also strain the entire aviation industry, reducing capacity and hampering the growth potential of the sector (Texeira, 2023).

3 METHODOLOGICAL FRAMEWORK

A methodological framework refers to the systematic, structured set of principles, processes, procedures, and rules that researchers use to conduct research and answer specific questions. It provides a blueprint for planning, executing, and evaluating research studies. The framework guides researchers in selecting appropriate research methods, tools, and techniques, ensuring that the research is conducted in a logical and organized manner (Hassan, 2023).

3.1 Information sources

Information sources refer to the places, channels, or locations where individuals or organizations can access data, facts, knowledge, or content on a particular subject or topic. Information sources vary widely in terms of their nature, accessibility, and reliability. They are essential for research, decision-making, learning, and staying informed about various subjects (Bhasin, 2023).

3.1.1 Primary sources

A primary source of information is an original source that provides direct or firsthand evidence about an event, object, person, or work of art. These sources are created at the time of the event or by a person directly involved in the event or subject being researched. Primary sources offer researchers unique and unmediated insights into historical events, opinions, and experiences (PMI, 2021).

For the FGP, primary sources of data are important towards understanding the current situation, to gather firsthand data and to begin the process of analyzing that data.

Some of the primary sources of data include personnel records, workforce surveys, job task analysis reports, collective bargaining agreements and budgetary documents.

3.1.2 **Secondary sources**

A secondary source of information is a work that interprets, analyzes, or synthesizes information from primary sources or other secondary sources. Unlike primary sources, which provide direct or firsthand evidence of an event, secondary sources offer analysis, commentary, or summaries of primary sources. Secondary sources are often created after the events they analyze and are considered one step removed from the original event or time period (PMI, 2021).

For the FGP, secondary sources of information provide context, background information and analysis. These sources can help in understanding industry trends, best practices, and the experiences of other organizations or jurisdictions. Some of the secondary sources of data include industry reports, academic journals, case studies and articles.

Chart 1

Information sources

Objectives	Information sources	
	Primary	**Secondary**
1. To develop a project charter to formally document the project's initiation.	Communication with stakeholders, brainstorming sessions	Organizational policies and procedures, PMBOK
2. To develop a scope management plan to ensure that the scope is well defined, controlled and aligned with the objectives of the project.	Personnel records, workload analysis	Regulatory documents, academic journals
3. To develop a schedule management plan to establish a framework to guide the development, management and controlling of the project schedule.	Personnel records, workload analysis	Industry standards and guidelines, shift management templates
4. To develop a cost management plan to establish a framework to plan, estimate, budget, control and monitor costs related to the project.	Personnel records	Cost estimation tools
5. To develop a quality management plan to ensure that the deliverables of the project meet the required quality standards and objectives.	Personnel and performance records	Academic research
6. To develop a resource management plan to establish a framework for identifying, acquiring, allocating and managing the resources required for the project.	Personne records, workload analysis	Industry reports

Objectives	Information sources	
	Primary	**Secondary**
7. To develop a communication management plan to establish a framework to plan, execute, monitor and control project communications.	Internal meetings	PMBOK, lessons learned from similar projects
8. To develop a risk management plan to establish a framework to identify, assess, mitigate and manage risks within the project.	Meetings with project stakeholders	Industry guidelines, case studies
9. To develop a procurement management plan to establish a framework for planning, executing and controlling all procurement-related activity within the project.	Meetings with stakeholders	Regulatory guidelines
10. To develop a stakeholder management plan to establish a framework for identifying, analyzing, engaging, and managing stakeholders throughout the project.	Meeting with stakeholders	Feedback surveys

Note: Own work

3.2 Research methods

Research methods refer to the techniques, procedures, and processes used by researchers to gather, analyze, interpret, and present data. These methods are systematic approaches employed to explore, describe, or explain phenomena and answer research questions or test hypotheses (Indeed, 2023).

The types of research being used for the FGP are analytical and qualitative.

3.2.1 **Analytical method**

Analytical research is a specific type of research methodology that involves the critical analysis of existing data or information to uncover patterns, relationships, and insights, or to test hypotheses. In analytical research, researchers use existing data and apply various statistical and mathematical techniques to analyze it (Rangalash, 2021).

3.2.2 **Qualitative method**

Qualitative research is a research methodology that aims to understand and interpret social phenomena from the perspective of the people involved. Unlike quantitative research, which focuses on numerical data and statistical analysis, qualitative research emphasizes gathering non-numerical data to explore attitudes, behaviors, perceptions, and underlying motivations (Rangalash, 2021).

The summary of research methods must be shown in a chart such as chart 2 below.

Chart 2

Research methods

Objectives	**Research methods**	
	Analytical Method	Qualitative Method
1. To develop a project charter to formally document the project's initiation.	Analytical research methods provide the empirical foundation necessary to make informed decisions about the project's scope, objectives,	Qualitative research methods play a significant role in developing a project charter by providing in-depth insights, understanding

Objectives	Research methods	
	risks, and resource requirements. Utilizing these methods in the early stages of project development strengthens the content and reliability of the project charter.	stakeholder perspectives, and clarifying project objectives.
2. To develop a scope management plan to ensure that the scope is well defined, controlled and aligned with the objectives of the project.	Analytical research methods can significantly contribute to the development of a scope management plan by providing detailed insights, enabling precise definition of project boundaries, and facilitating effective scope control.	Qualitative research methods play a crucial role in developing a scope management plan by providing detailed insights into stakeholders' needs, expectations, constraints, and the nuances of the project environment.
3. To develop a schedule management plan to establish a framework to guide the development, management and controlling of the project schedule.	Analytical research methods can significantly aid in the development of a schedule management plan by providing data-driven insights, identifying patterns, and offering a clear understanding of the tasks and processes involved in the project	Qualitative research methods contribute significantly to the development of a schedule management plan by providing detailed insights into stakeholders' expectations, risks, constraints, and the contextual factors that can impact the project timeline.
4. To develop a cost management plan to establish a framework to plan, estimate, budget, control and monitor costs related to the project.	Analytical research methods play a crucial role in developing a cost management plan by providing data-driven	Qualitative research methods play a crucial role in developing a cost management plan by providing detailed

Objectives	Research methods	
	insights, enabling accurate cost estimation, and facilitating effective budget control.	insights into the factors influencing project costs, stakeholder expectations, and potential cost-related risks.
5. To develop a quality management plan to ensure that the deliverables of the project meet the required quality standards and objectives.	Analytical research methods are invaluable in developing a quality management plan by providing data-driven insights, identifying improvement opportunities, and ensuring that the project aligns with quality standards and stakeholder expectations.	Qualitative research methods play a significant role in developing a quality management plan by providing in-depth insights into stakeholders' perspectives, identifying quality-related issues, and informing the creation of effective quality assurance and control strategies.
6. To develop a resource management plan to establish a framework for identifying, acquiring, allocating and managing the resources required for the project.	Analytical research methods are instrumental in developing a resource management plan by providing data-driven insights, enabling accurate resource allocation, and ensuring optimal utilization of resources.	Qualitative research methods are instrumental in developing a resource management plan by providing detailed insights into the needs, capabilities, and expectations of human resources, suppliers, and other stakeholders.
7. To develop a communication management plan to establish a framework to plan, execute, monitor and control project communications.	Analytical research methods are vital for developing a communications management plan as they provide data-driven insights, help in understanding	Qualitative research methods play a vital role in developing a communications management plan by providing nuanced insights into stakeholders'

Objectives	Research methods	
	stakeholder needs, and enable effective communication strategies	attitudes, perceptions, and communication preferences.
8. To develop a risk management plan to establish a framework to identify, assess, mitigate and manage risks within the project.	Analytical research methods are instrumental in developing a risk management plan by providing data-driven insights, enabling accurate risk assessment, and facilitating informed decision-making.	Qualitative research methods are valuable in developing a risk management plan by providing detailed insights into potential risks, stakeholders' perceptions, and the context in which risks may occur.
9. To develop a procurement management plan to establish a framework for planning, executing and controlling all procurement-related activity within the project.	Analytical research methods play a crucial role in developing a procurement management plan by providing data-driven insights, enabling effective supplier selection, and ensuring optimal procurement strategies.	Qualitative research methods are valuable in developing a procurement management plan as they provide rich, context-specific insights into the needs, expectations, and preferences of stakeholders involved in the procurement process.
10. To develop a stakeholder management plan to establish a framework for identifying, analyzing, engaging, and managing stakeholders throughout the project.	Analytical research methods are crucial in developing a stakeholder management plan by providing data-driven insights, enabling comprehensive stakeholder analysis, and facilitating effective engagement strategies.	Qualitative research methods play a crucial role in developing a stakeholder management plan by providing in-depth insights into stakeholders' perspectives, attitudes, and behaviors.

Note: Own work

3.3 Tools

In project management, a tool refers to any software, technique, template, or method used to assist project managers and their teams in planning, executing, monitoring, and controlling projects. These tools are designed to help project managers streamline processes, improve collaboration, manage resources, track progress, and make informed decisions.

These tools help project managers develop a well-rounded plan by integrating diverse insights, analyzing key data points, defining tasks and timelines, and anticipating risks. Together, they provide a structured framework to assess project needs, allocate resources efficiently, and manage potential challenges, ensuring that the project stays aligned with its objectives and budget.

Expert judgment involves leveraging the knowledge and experience of professionals who have specialized expertise relevant to the project. These experts provide insights on critical decisions, such as resource allocation, risk management, and project scheduling. Their input is valuable for setting realistic expectations and enhancing the accuracy of project estimates (PMI, 2021).

Data gathering is a tool that involves collecting information through methods such as interviews, surveys, and focus groups to understand project requirements and constraints. It helps in making informed decisions by providing evidence-based data on various aspects of the project (PMI, 2021).

Meetings facilitate collaboration among project stakeholders and team members, ensuring alignment on goals, tasks, and milestones. Regular meetings help monitor progress, address issues, and make real-time adjustments to the project plan (PMI, 2021).

Data analysis tools are used to evaluate data gathered during the project to identify trends, issues, and opportunities. Techniques such as cost-benefit analysis and root cause analysis help in optimizing project decisions and ensuring that project objectives are met efficiently (PMI, 2021).

The WBS is a hierarchical decomposition of the project's deliverables into smaller, manageable components. It provides a clear framework for organizing and defining the scope of the project, ensuring that all work necessary to achieve the project objectives is accounted for (PMI, 2021).

Leads and lags refer to the scheduling adjustments made to tasks in a project. Leads allow tasks to start earlier than scheduled, while lags introduce delays between tasks. These tools help optimize the timing of activities to maintain project efficiency (PMI, 2021).

The critical path method is a scheduling technique that identifies the longest sequence of activities in a project. This method helps project managers prioritize tasks and allocate resources to critical activities to ensure timely project completion (PMI, 2021).

Decision-making tools are used to evaluate different options based on predefined criteria. These tools ensure that choices made during the project planning and execution phases are objective and aligned with the project’s goals (PMI, 2021).

The cost of quality tool analyzes the costs associated with ensuring project deliverables meet quality standards. This includes the costs of prevention, appraisal, and failure, helping project managers balance quality with budget constraints (PMI, 2021).

Data representation tools, such as flowcharts, histograms, and Gantt charts, visually display project data to make it easier to interpret and analyze. These tools help communicate complex information clearly to stakeholders (PMI, 2021).

Risk categorization involves classifying project risks based on their source, impact, and likelihood. This tool helps in organizing and prioritizing risks, making it easier to develop mitigation strategies for the most critical risks (PMI, 2021).

Stakeholder analysis identifies and assesses the interests, influence, and expectations of all stakeholders involved in the project. This tool helps in developing strategies to engage stakeholders effectively and manage their expectations throughout the project lifecycle (PMI, 2021).

Chart 3

Tools

Objectives	Tools
1. To develop a project charter to formally document the project's initiation.	Expert judgement, data gathering, meetings
2. To develop a scope management plan to ensure that the scope is well defined, controlled and aligned with the objectives of the project.	Expert judgement, data analysis, WBS
3. To develop a schedule management plan to establish a framework to guide the development, management and controlling of the project schedule.	Leads and lags, critical path method
4. To develop a cost management plan to establish a framework to plan, estimate,	Expert judgement, data analysis, decision making

budget, control and monitor costs related to the project.	
5. To develop a quality management plan to ensure that the deliverables of the project meet the required quality standards and objectives.	Expert judgement, cost of quality, decision making
6. To develop a resource management plan to establish a framework for identifying, acquiring, allocating and managing the resources required for the project.	Data representation
7. To develop a communication management plan to establish a framework to plan, execute, monitor and control project communications.	Expert judgement, communication skills
8. To develop a risk management plan to establish a framework to identify, assess, mitigate and manage risks within the project.	Expert judgement, data analysis, risk categorization
9. To develop a procurement management plan to establish a framework for planning, executing and controlling all procurement-related activity within the project.	Expert judgement, data analysis
10. To develop a stakeholder management plan to establish a framework for identifying, analyzing, engaging, and managing stakeholders throughout the project.	Stakeholder analysis

Note: Own work

3.4 Assumptions and constraints

The PMBOK Guide describes an assumption as a factor in the planning process that is considered to be true, real or certain without proof or demonstration.

On the other hand, a constraint is defined as a limiting factor that affects the execution of a project, program or portfolio or process. (PMI, 2021).

Understanding and managing these assumptions and constraints is crucial for project managers to effectively plan, execute, and control the project. Failure to consider these factors can lead to project delays, budget overruns, and unmet stakeholder expectations.

Chart 4

Assumptions and constraints

Objectives	Assumptions	Constraints
1. To develop a project charter to formally document the project's initiation.	Key stakeholders will provide necessary support and resources throughout the project.	Constraints imposed by organizational policies, culture, or hierarchies that impact project implementation.
2. To develop a scope management plan to ensure that the scope is well defined, controlled and aligned with the objectives of the project.	Assuming that the historical and real-time data used to assess air traffic patterns and optimize staffing levels are accurate and reliable.	The time to gather all necessary information to develop the scope management plan to be collated in a short space of time.
3. To develop a schedule management plan to establish a framework to guide the development, management and controlling of the project schedule.	The time allotted will be sufficient. There will be no significant delays encountered.	Stakeholders may not deliver information on time.
4. To develop a cost management plan to establish a framework to plan, estimate, budget, control and monitor costs related to the project.	The project will be completed as per budget and in alignment cost management plan.	Economic factors may change expected costs.
5. To develop a quality management plan to ensure that the deliverables of the project meet the required quality standards and objectives.	The added manpower will be of the	The added manpower will not

Objectives	Assumptions	Constraints
	expected quality.	be of the expected quality.
6. To develop a resource management plan to establish a framework for identifying, acquiring, allocating and managing the resources required for the project.	Assuming that the required air traffic control staff will be available for the optimization initiatives without significant turnover or attrition during the project.	Constraints arising from existing collective bargaining agreements and union regulations that could impact the implementation of new staffing optimization strategies and training programs
7. To develop a communication management plan to establish a framework to plan, execute, monitor and control project communications.	Assuming that the chosen communication tools, such as emails, internal messaging systems, and meetings, will function without significant interruptions, ensuring effective communication among team members and stakeholders.	Constraints related to the confidentiality of certain information, especially concerning sensitive staffing decisions, which might limit the depth of information that can be shared.
8. To develop a risk management plan to establish a framework to identify, assess, mitigate and manage risks within the project.	Assuming that the project will comply with all relevant aviation regulations, safety standards, and	Constraints imposed by aviation regulatory bodies that might limit certain staffing optimization strategies, scheduling methods,

Objectives	Assumptions	Constraints
	legal requirements regarding staffing and air traffic control operations.	or technologies that can be employed.
9. To develop a procurement management plan to establish a framework for planning, executing and controlling all procurement-related activity within the project.	Assuming that the project budget allocated for procurement activities will be sufficient to cover all necessary expenses.	Constraints imposed by aviation regulatory bodies that might limit certain procurement choices or require specific certifications from vendors.
10. To develop a stakeholder management plan to establish a framework for identifying, analyzing, engaging, and managing stakeholders throughout the project.	Assuming that stakeholders have the necessary influence to facilitate changes in staffing policies and procedures within the air traffic control unit.	Conflicting interests among different stakeholder groups, requiring careful management to balance the needs and expectations of various parties involved.

Note: Own work

3.5 Deliverables

A deliverable is defined as any unique and verifiable product, result, or capability to perform a service that is required to be produced to complete a process, phase or project. Deliverables may be tangible or intangible (PMI, 2021).

Chart 5

Deliverables

Objectives	Deliverables
1. To develop a project charter to formally document the project's initiation.	Project Charter. This is developed through defining the project's (SMART) objectives, identifying the scope and the related assumptions and constraints, the list of stakeholders and their expectations, and the methodology that will be used to execute the project.
2. To develop a scope management plan to ensure that the scope is well defined, controlled and aligned with the objectives of the project.	Scope Management Plan. This is developed using the project's objectives, deliverables, constraints and assumptions, the WBS, and a mechanism for the verification and control of the scope.
3. To develop a schedule management plan to establish a framework to guide the development, management and controlling of the project schedule.	Schedule Management Plan. This is developed utilizing the WBS, determining the dependency between tasks, determining the availability of resources, estimating the duration of each activity, and developing a mechanism to control the schedule.
4. To develop a cost management plan to establish a framework to plan, estimate, budget, control and monitor costs related to the project.	Cost Management Plan. This involves cost estimation utilizing the appropriate cost estimation techniques, developing a cost breakdown based on the WBS, and implementing a mechanism to monitor, control and evaluate costs.
5. To develop a quality management plan to ensure that the deliverables of the project meet the required quality standards and objectives.	Quality Management Plan. This is developed by identifying the quality objectives of the project, defining the specific quality metrics, and outlining processes for both quality control and quality assurance.
6. To develop a resource management plan to establish a framework for identifying, acquiring, allocating and managing the resources required for the project.	Resource Management Plan. This is developed by identifying the resource needs of the project, acquiring the needed resources, allocating the resources, monitoring and controlling the deployment of resources, including the identification of conflicts and resolving those conflicts.
7. To develop a communication management plan to establish a framework	Communication Management Plan. This is developed through a stakeholder analysis,

to plan, execute, monitor and control project communications.	determination of the communication objectives of the project, identifying the appropriate communication tools, developing a communications schedule and protocol, and establishing a feedback mechanism.
8. To develop a risk management plan to establish a framework to identify, assess, mitigate and manage risks within the project.	Risk Management Plan. This is developed through the identification of risks, assessment of those risks, development of risk mitigation and response strategies, as well as strategies for risk monitoring and control.
9. To develop a procurement management plan to establish a framework for planning, executing and controlling all procurement-related activity within the project.	Procurement Management Plan. This is developed by identifying the needs and setting the procurement goals, identifying internal and external stakeholders, developing a sourcing strategy, and documenting and reporting on procurement activities.
10. To develop a stakeholder management plan to establish a framework for identifying, analyzing, engaging, and managing stakeholders throughout the project.	Stakeholder Management Plan. This is developed by identifying stakeholders and conducting a stakeholder analysis, determining stakeholder needs, identifying stakeholder engagement strategies, managing stakeholder expectations, establish a mechanism for managing conflict, receiving feedback and evaluating engagement strategies.

Note: Own work

4 RESULTS

The results chapter presents the key components of the project management plan developed to address the staffing challenges facing the air traffic control unit. Given the critical nature of air traffic control operations and the significant impacts that staffing shortages can have on safety, efficiency, and costs, a comprehensive project management approach was essential. This chapter details the various management plans created to ensure the successful execution and delivery of the staffing optimization initiative. Together, the interconnected management plans provide a robust framework to guide the project team in effectively managing the people, processes, and resources required to achieve the desired outcomes.

4.1. Project Charter

Figure 4: Project Charter

Project Charter	
Project Name: Optimization of Staffing for St. Lucia's Air Traffic Control Units	
Project Start Date:	Project End Date:
September 3, 2024	February 18, 2026
General Objective:	
To enhance the efficiency, safety, and stakeholder satisfaction of the air traffic control system in Saint Lucia by developing and implementing a comprehensive staffing plan. First, conduct a thorough assessment and data collection to establish a robust baseline for air traffic controller workload, safety indicators, and operational efficiency. Then, develop a plan which aims to reduce air traffic controller workload by 10%, improve safety by addressing fatigue concerns, increase operational efficiency by 10%, and meet the diverse needs of stakeholders through collaborative project planning and tailored staffing strategies.	
Specific Objectives:	
1. To conduct a thorough assessment and data collection to establish a robust baseline for air traffic controller workload, safety indicators, and operational efficiency. These baseline metrics will serve as a benchmark against which the success of the proposed improvements can be objectively measured and confirmed. 2. To reduce air traffic controller workload by at least 10% within a year by analyzing current staffing levels in comparison to workload, identifying	

opportunities for automation, and developing a staffing plan that optimizes the use of air traffic controllers.
3. To improve air traffic controller safety by 10% within a year by developing and implementing a staffing plan that ensures that air traffic controllers are not overworked or fatigued and are provided with the support they need to perform their jobs safely.
4. To ensure an increase air traffic control efficiency by 10% within a year by monitoring the implementation of the staffing plan by identifying and eliminating inefficiencies in the system and by implementing new technologies and processes that can improve the flow of air traffic.
5. To meet the needs of the various stakeholders of the air traffic control system by involving them in the project planning and developing a staffing plan the meets the needs of all stakeholders.

Business Case:

The air traffic control system is a critical component of the aviation industry, and it is essential for the safe and efficient movement of air traffic. However, the air traffic control system is currently facing several challenges, including increasing traffic levels, staffing shortages, and outdated technology.

The project to optimize staffing at the air traffic control units is a critical investment in the future of aviation in St. Lucia, and by extension, the economy which is heavily dependent on tourism. The project will help to address the challenges facing the air traffic control system by developing and implementing a staffing plan that will improve air traffic controller workload and safety, increase air traffic control efficiency, and meet the needs of air traffic control stakeholders.

The air traffic control system is facing several challenges, including:

- Increasing traffic levels: The number of air traffic movements is projected to increase significantly in the coming years. This will put a strain on the current air traffic control system, which is already operating at near capacity.
- Staffing shortages: The air traffic control system is facing a shortage of qualified air traffic controllers. This shortage is due to a number of factors, including an aging workforce, high attrition rates, and a lack of qualified recruits.
- Outdated technology: The air traffic control system is still relying on some outdated technology. This technology is not able to keep up with the increasing demands of the system, and it is a major source of delays and inefficiencies.

The project to optimize staffing at an air traffic control unit will develop and implement a staffing plan that will address the challenges facing the air traffic control system. The staffing plan will include the following:

- An analysis of current staffing levels and workload: This analysis will help to identify areas where air traffic controllers are overworked or underutilized.

- Identification of opportunities for automation: This analysis will help to identify tasks that can be automated, which will free up air traffic controllers to focus on more complex tasks.
- Development of a staffing plan: The staffing plan will outline the number and type of air traffic controllers that are needed to meet the demands of the system.
- Implementation of the staffing plan: The staffing plan will be implemented through a combination of hiring, training, and attrition.

The project to optimize staffing at an air traffic control unit will provide a number of benefits, including:

- Reduced air traffic controller workload: This will improve the safety and efficiency of the air traffic control system.
- Improved air traffic controller safety: This will reduce the risk of accidents and incidents.
- Increased air traffic control efficiency: This will reduce delays and improve the flow of air traffic.
- Reduced costs: The project will reduce costs by optimizing the use of air traffic control resources.
- Increased revenue: The project will increase revenue by attracting more air travelers and airlines.

Scope:

The scope of this project includes the following:

- Analysis of current staffing levels and workload
- Identification of opportunities for staffing optimization
- Development of a staffing plan
- Implementation of the staffing plan
- Monitor the implementation of the staffing plan

Excluded:

The following are excluded from the scope of this project:

- Procurement of new equipment or software
- Changes to the air traffic control system

Success Criteria:

The project will be considered successful if the following criteria are met:

- The staffing plan is implemented on time and within budget.
- The staffing plan results in improved safety and efficiency at the air traffic control unit.
- The staffing plan results in reduced costs associated with staffing.

Risks:

The following are some of the potential risks associated with this project:

- Resistance to change from air traffic controllers.
- Difficulty in identifying staffing optimization opportunities.

- Unexpected changes in air traffic volume.

Assumptions:

The following assumptions are made about this project:

- Air traffic controllers will be cooperative with the project team.
- The ECCAA will provide the necessary support for the project.
- There will be no major changes to the air traffic control system during the course of the project.

Budget:

Expense	Amount
Project Initiation and Planning	$20,000
Data Collection and Analysis	$48,000
Model Development and Evaluation	$34,000
Implementation Planning and Design	$69,000
Pilot Testing	$55,000
Implementation and Roll Out	$62,000
Monitoring and Evaluation	$55,000
Project Closure	$16,000

Schedule:

Milestone	Description	Start Date	End Date
Develop a project management plan	The project management plan will outline the processes for managing the project scope, schedule, cost, quality, resources, communications, and risk.	September 3, 2024	January 27, 2025
Analyze current staffing levels and workload	This analysis will help to identify areas where air traffic controllers are overworked or underutilized.	April 23, 2025	July 18, 2025
Identify opportunities for automation	This analysis will help to identify tasks that can be automated, which will free up air traffic controllers to focus on more complex tasks.	July 16, 2025	July 29, 2025
Develop a staffing plan	The staffing plan will outline the number and type of air traffic controllers that are needed to meet the demands of the system.	October 1, 2025	October 28, 2025
Implement the staffing plan	The staffing plan will be implemented through a combination of hiring, training, and attrition.	October 29, 2025	December 9. 2025

Monitor and evaluate the staffing plan	The staffing plan will be monitored and evaluated to ensure that it is meeting the desired outcomes.	October 29, 2025	February 18, 2026
Stakeholders:			
Air Traffic Controllers Air Traffic Control Management (SLASPA) Airlines and Pilots Civil Aviation Regulation (ECCAA) Union (CSA)			
Project Closure:			
The project will be considered closed when the following criteria are met: The staffing plan has been implemented. The project goals have been met. The project has been completed on time and within budget.			

Note: Own Work

4.2 Scope Management Plan

4.2.1 Overview

The purpose of this scope management plan is to serve as a document that outlines how the scope of a project will be defined, validated, and controlled. It is a key component of project management and is developed during the project planning phase and updated as necessary. It provides guidance on how the project team will manage and control changes to the project scope throughout the project life cycle. This plan helps ensure that the project stays on track, meets its objectives, and delivers the expected outcomes.

This scope management plan will define and control the scope of the Optimization of Staffing for St. Lucia's Air Traffic Control Units project. This includes identifying the

project's deliverables, defining the work that is included and excluded from the project, and ensuring that the project meets the requirements of its stakeholders.

4.2.2 **Scope Definition**

The scope of the Optimization of Staffing for St. Lucia's Air Traffic Control Units project includes the following:

- To analyze current staffing levels and workload.
- To identify opportunities for staffing optimization.
- To develop a staffing plan.
- To implement the staffing plan.
- To monitor the implementation of the staffing plan.

4.2.3 **Project Scope**

The scope of this project was developed collaboratively, incorporating input from key stakeholders.

The scope of the project includes the following:

- Analysis of current staffing levels and workload for all air traffic control positions
- Identification of opportunities for staffing optimization through a variety of methods, such as process analysis, workload modeling, and benchmarking
- Development of a staffing plan that takes into account the following factors:
    - Air traffic volume
    - Air traffic complexity
    - Air traffic controller experience and qualifications

- Civil aviation regulations
- Collective bargaining agreements

- Implementation of the staffing plan, which may involve hiring new air traffic controllers, reassigning existing air traffic controllers, or changing air traffic control procedures.

- Monitoring and evaluation of the staffing plan to ensure that it meeting its objectives and that it is compliant with civil aviation regulations and collective bargaining agreements.

4.2.4 **Scope Responsibility Matrix**

Chart 6

Scope Responsibility Matrix

Task	Responsible
Analyze current staffing levels and workload.	Project manager, air traffic controllers, air traffic control management
Identify opportunities for staffing optimization	Project manager, air traffic controllers, air traffic control management
Develop a staffing plan	Project manager, air traffic controllers, air traffic control management, civil aviation regulator, unions
Implement the staffing plan	Project manager, air traffic controllers, air traffic control management, civil aviation regulator
Monitor the implementation of the plan	Project manager, air traffic controllers, air traffic control management, civil aviation regulator

Note: Own work

4.2.5 **Requirements Traceability Matrix**

The Requirements Traceability Matrix provides a comprehensive framework to trace and monitor project requirements throughout the lifecycle. It links each requirement to its source, related activities, and corresponding deliverables, ensuring no requirement is

overlooked. Additionally, it facilitates stakeholder communication, supports change management, and ensures alignment with the project's scope, objectives, and constraints.

Chart 7

Requirements Traceability Matrix

ID	Requirements Description	Project Objective	Deliverable	Priority	Acceptance Criteria
RQ1	Assess current staffing levels and workloads	To analyze current staffing levels and workload	Staffing Analysis Report	High	Report must include accurate staffing levels, workload metrics, and identified gaps.
RQ2	Identify staffing inefficiencies and optimization opportunities	To identify opportunities for staffing optimization	Optimization Recommendations Report	High	Document should detail actionable opportunities with cost-benefit analysis.
RQ3	Develop a comprehensive staffing plan	To develop a staffing plan	Staffing Plan Document	High	Plan should include roles, responsibilities, scheduling, and resource allocation details.
RQ4	Implement an optimized staffing structure	To implement the staffing plan	Implementation Report	High	Implementation must follow the approved plan, with progress validated against milestones.
RQ5	Ensure effective monitoring and continuous improvement	To monitor implementation of the staffing plan	Monitoring and Evaluation Report	High	Report must include key performance indicators (KPIs), deviations, and

					improvement suggestions.

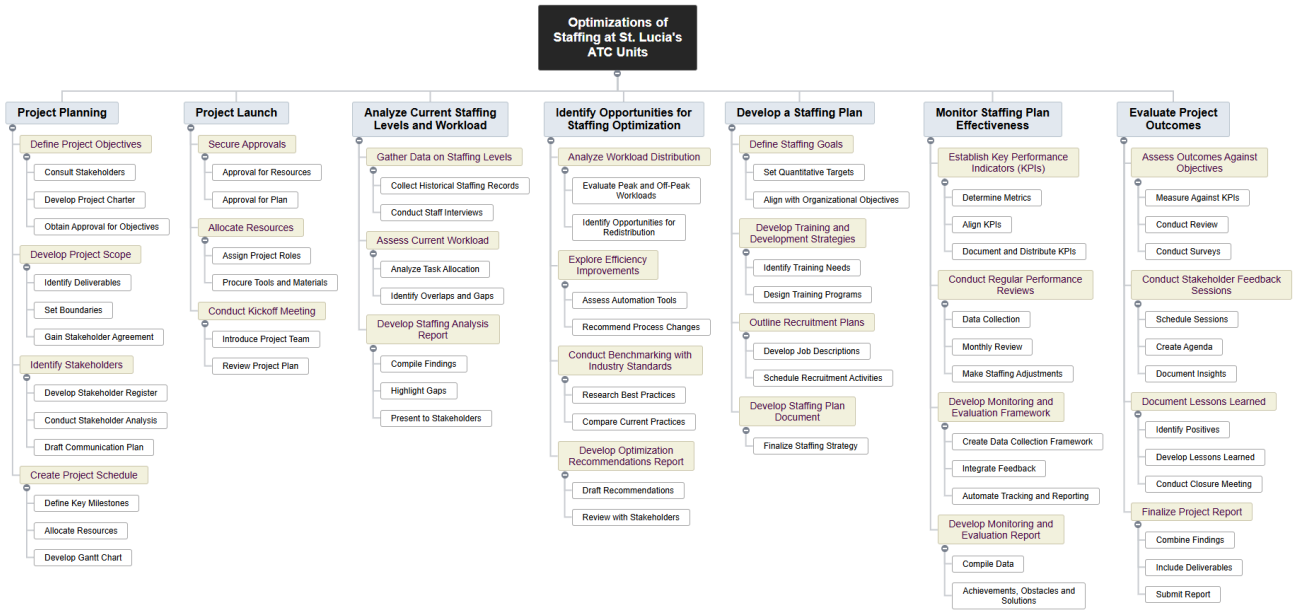
Note: Own work

4.2.6 WBS

For the staffing optimization project, the WBS outlines all critical activities necessary to evaluate current staffing levels, identify gaps, and implement an optimized staffing model tailored to operational needs.

Figure 5

Work Breakdown Structure



Note: Own Work

4.2.8 **WBS Dictionary**

Chart 8

WBS Dictionary

WBS Level	WBS Code	Activity Name	Description
1	0	Optimization of Staffing at St. Lucia's ATC Units	Overall project
2	1	Project Planning	Project initiation and planning
3	1.1	Define Project Objectives	Establish specific, measurable, and time-bound goals that define what a project aims to achieve
4	1.1.1	Consult Stakeholders	Conduct interviews and workshops with key stakeholders to identify the objectives and goals of the project.
4	1.1.2	Develop Project Charter	Document project goals, key deliverables, high-level risks, assumptions, and constraints.
4	1.1.3	Obtain Approval for Objectives	Present the project charter to stakeholders for review and formal approval.
3	1.2	Develop Project Scope	Determine project boundaries and define goals, deadlines, and project deliverables
4	1.2.1	Identify Deliverables	Define all project outputs
4	1.2.2	Set Boundaries	Clearly outline what is included and excluded in the project to prevent scope creep.
4	1.2.3	Gain Stakeholder Agreement	Secure consensus from stakeholders on the project scope
3	1.3	Identify Stakeholders	Identify individuals, organizations, or other entities that have an interest in a project
4	1.3.1	Develop Stakeholder Register	Create a list of stakeholders, including their roles, responsibilities, and influence.
4	1.3.2	Conduct Stakeholder Analysis	Assess the interests, expectations, and impact of each stakeholder group on the project.

4	1.3.3	Draft Communication Plan	Define communication methods and frequency tailored to stakeholder needs.
3	1.4	Create Project Schedule	Outline the tasks, milestones, dependencies, and start and end dates for a project
4	1.4.1	Define Key Milestones	Identify critical deadlines
4	1.4.2	Allocate Resources	Allocate Resources
4	1.4.3	Develop Gantt Chart	Visualize the project schedule, milestones, and task dependencies
2	2	Project Launch	Start executing the project
3	2.1	Secure Approvals	Get necessary green lights to proceed
4	2.1.1	Approval for Resources	Obtain the necessary human, financial, and technical resources for the project.
4	2.1.2	Approval for Plan	Present the project plan to stakeholders for endorsement.
3	2.2	Allocate Resources	Assign available resources
4	2.2.1	Assign Project Roles	Identify and appoint team members to specific project tasks.
4	2.2.2	Procure Tools and Materials	Ensure access to software, data collection tools, and reporting templates.
3	2.3	Conduct Kickoff Meeting	Conduct meeting that marks the beginning of a project
4	2.3.1	Introduce Project Team	Facilitate introductions and set expectations for roles and collaboration.
4	2.3.2	Review Project Plan	Share and discuss the project charter, schedule, and communication plan
2	3	Analyze Current Staffing Levels and Workload	Gather and analyze data on current staffing levels, air traffic volume, task complexity, and workload distribution.
3	3.1	Gather Data on Staffing Levels	Gather data on current staffing levels
4	3.1.1	Collect Historical Staffing Records	Review past staffing data to identify patterns and trends.

4	3.1.2	Conduct Staff Interviews	Engage with air traffic controllers to understand workload distribution and challenges.
3	3.2	Assess Current Workload	Review air traffic volume, task complexity, and workload distribution.
4	3.2.1	Analyze Task Allocation	Evaluate how tasks are assigned and whether they align with individual roles.
4	3.2.2	Identify Overlaps and Gaps	Determine areas of duplication or unassigned responsibilities.
3	3.3	Develop Staffing Analysis Report	Report on current staffing situation
4	3.3.1	Compile Findings	Summarize data collected on staffing and workload.
4	3.3.2	Highlight Gaps	Present areas needing immediate attention in staffing levels.
4	3.3.3	Present to Stakeholders	Share the analysis report with key stakeholders for feedback.
2	4	Identify Opportunities for Staffing Optimization	Analyze the collected data and identify potential opportunities for staffing optimization, such as workload redistribution, task automation, or cross-training.
3	4.1	Analyze Workload Distribution	Analyze the collected data relating to workload distribution
4	4.1.1	Evaluate Peak and Off-Peak Workloads	Assess workload intensity during different times to identify uneven distributions.
4	4.1.2	Identify Opportunities for Redistribution	Explore ways to balance tasks among staff more effectively.
3	4.2	Explore Efficiency Improvements	Identify potential opportunities for staffing optimization
4	4.2.1	Assess Automation Tools	Identify technologies that can support staff and reduce workload.
4	4.2.2	Recommend Process Changes	Suggest adjustments to workflows to improve efficiency
3	4.3	Conduct Benchmarking with Industry Standards	Compare service providers within the industry

4	4.3.1	Research Best Practices	Review staffing models from similar air traffic control units.
4	4.3.2	Compare Current Practices	Evaluate how the unit's performance measures up to industry norms.
3	4.4	Develop Optimization Recommendations Report	Report on recommendations
4	4.4.1	Draft Recommendations	Detail specific actions to improve staffing efficiency.
4	4.4.2	Review with Stakeholders	Validate recommendations with key stakeholders.
2	5	Develop a Staffing Plan	Develop a detailed staffing plan that outlines the recommended staffing levels, skill requirements, and deployment strategies for the air traffic control unit.
3	5.1	Define Staffing Goals	Determine plan objectives
4	5.1.1	Set Quantitative Targets	Define metrics for optimal staffing levels
4	5.1.2	Align with Organizational Objectives	Ensure goals align with broader strategic plans
3	5.2	Develop Training and Development Strategies	Develop training plan
4	5.2.1	Identify Training Needs	Conduct a skills gap analysis.
4	5.2.2	Design Training Programs	Develop workshops and courses tailored to staff needs
3	5.3	Outline Recruitment Plans	Detail plans for staff recruitment
4	5.3.1	Develop Job Descriptions	Create detailed job roles for recruitment
4	5.3.2	Schedule Recruitment Activities	Plan and conduct recruitment drives
3	5.4	Develop Staffing Plan Document	Detail staffing plan
4	5.4.1	Finalize Staffing Strategy	Integrate training, recruitment, and task allocation strategies
2	6	Monitor Staffing Plan Effectiveness	Judge effectiveness of plan

3	6.1	Establish Key Performance Indicators (KPIs)	Define measurable indicators to track staffing plan success, such as task completion rates, overtime reduction, and workload distribution metrics.
4	6.1.1	Determine Metrics	Identify relevant metrics for monitoring staffing balance and efficiency
4	6.1.2	Align KPIs	Collaborate with team leads to align KPIs with project goals
4	6.1.3	Document and Distribute KPIs	Document and distribute KPIs to stakeholders
3	6.2	Conduct Regular Performance Reviews	Schedule periodic assessments to evaluate the effectiveness of the staffing plan and make necessary adjustments
4	6.2.1	Data Collection	Collect data on workload distribution, staff utilization, and performance metrics
4	6.2.2	Monthly Review	Conduct monthly review meetings to analyze results
4	6.2.3	Make Staffing Adjustments	Adjust staffing assignments and workload based on findings
3	6.3	Develop Monitoring and Evaluation Framework	Establish a systematic approach for ongoing monitoring and assessments
4	6.3.1	Create Data Collection Framework	Create a structured framework for data collection and analysis
4	6.3.2	Integrate Feedback	Integrate feedback mechanisms for staff and supervisors
4	6.3.3	Automate Tracking and Reporting	Use software tools to automate tracking and reporting
3	6.4	Develop Monitoring and Evaluation Report	Summarize results from monitoring activities and document recommendations for plan adjustments
4	6.4.1	Compile Data	Compile monitoring data into a structured report
4	6.4.2	Achievements, Obstacles and Solutions	Highlight successes, challenges, and corrective actions taken
2	7	Evaluate Project Outcomes	Assess project's performance and outcomes against its goals and objectives

3	7.1	Assess Outcomes Against Objectives	Compare project deliverables with initial objectives to evaluate overall success
4	7.1.1	Measure Against KPIs	Use pre-defined KPIs to measure success
4	7.1.2	Conduct Review	Review workload balance, overtime rates, and task completion timelines
4	7.1.3	Conduct Surveys	Conduct surveys to collect qualitative feedback from team members
3	7.2	Conduct Stakeholder Feedback Sessions	Organize feedback meetings with key stakeholders to gather insights on project success and areas for improvement
4	7.2.1	Schedule Sessions	Schedule stakeholder feedback sessions
4	7.2.2	Create Agenda	Create a structured agenda to discuss outcomes and challenges
4	7.2.3	Document Insights	Document insights for inclusion in the final project report
3	7.3	Document Lessons Learned	Capture key takeaways from the project to inform future staffing initiatives
4	7.3.1	Identify Positives	Identify what worked well and what could be improved
4	7.3.2	Develop Lessons Learned	Develop a "lessons learned" section for the final project report
4	7.3.3	Conduct Closure Meeting	Conduct a closure meeting to discuss lessons with the team
3	7.4	Finalize Project Report	Compile a comprehensive report summarizing all project activities, outcomes, and recommendations
4	7.4.1	Combine Findings	Combine findings from monitoring, stakeholder feedback, and evaluations into a cohesive document
4	7.4.2	Include Deliverables	Include all project deliverables
4	7.4.3	Submit Report	Submit the final report to SLASPA management and relevant stakeholders

Note: Own Work

4.2.9 Project Exclusions

The following are excluded from the scope of the project:

- Procurement of new equipment or software
- Changes to the air traffic control system

4.2.10 Scope Validation and Verification

Scope validation and verification are crucial phases in project management to ensure that the project delivers the desired outcomes and meets the needs of stakeholders. In the context of this project, scope validation and verification will be conducted as described below:

4.2.10.1 Scope Validation

Scope validation focuses on confirming that the project scope aligns with stakeholder expectations and requirements. This process typically occurs during the project planning and initiation phase and involves:

• Stakeholder Review: Gather and review feedback from stakeholders, including air traffic controllers, management, and aviation authorities, to ensure the project scope addresses their needs and expectations.

• Requirements Analysis: Thoroughly analyze project requirements documentation, including functional and non-functional requirements, to ensure the project scope encompasses all essential elements.

• Scope Baseline: Establish a clear and documented scope baseline that outlines the project's deliverables, boundaries, and exclusions.

• Stakeholder Approval: Obtain formal approval from key stakeholders on the validated scope baseline to ensure alignment and prevent misunderstandings later in the project.

4.2.10.2 Scope Verification

Scope verification focuses on ensuring that the project deliverables meet the agreed-upon scope baseline. This process typically occurs during the project execution and completion phases and involves:

• Deliverable Review: Conduct thorough reviews of project deliverables against the scope baseline to ensure they meet the specified requirements, functions, and quality standards.

• Stakeholder Feedback: Gather feedback from stakeholders, including air traffic controllers, management, and aviation authorities, on the acceptability and effectiveness of the project deliverables.

• Scope Acceptance: Obtain formal acceptance from key stakeholders on the delivered project deliverables, ensuring they meet the agreed-upon scope and address stakeholder needs.

• Scope Change Management: Implement a formal change management process to address any scope changes that may arise during project execution. This process ensures that stakeholders are informed, and changes are controlled and documented.

By implementing these scope validation and verification measures, the project team will ensure that the project delivers the intended outcomes, meets stakeholder expectations,

and aligns with the approved scope baseline. This contributes to the overall success of the project in optimizing staffing and enhancing air traffic control efficiency and safety.

4.2.11 **Project Success Criteria**

The project will be considered successful if the following criteria are met:

• The staffing plan is implemented on time and within budget.

• The staffing plan results in improved safety and efficiency at the air traffic control unit.

• The staffing plan results in a greater level of compliance with regulations.

4.2.12 **Approvals**

The project scope statement has been approved by the following stakeholders:

- Saint Lucia Air and Sea Ports Authority – Airports Department
- Regulators (ECCAA)
- Air traffic controllers

4.2.13 **Scope Control**

The project manager will be responsible for controlling the scope of the project. This includes identifying and managing any changes to the project scope. Any changes to the project scope must be approved by the project manager and the key stakeholders.

4.2.14 **Change Management Process**

The following change management process will be used to manage any changes to the project scope:

1. Submitting Change Requests:

- Provide a standardized form for submitting change requests, capturing the following details:
  - Description of the proposed change
  - Rationale for the change (cost savings, efficiency improvement, etc.)
  - Potential impact on scope, schedule, budget, and risks
  - Proposed implementation plan

- Submitting party's name and contact information

- Establish clear channels for submitting requests. On this project, these are email, online portal, or in-person submission.
- Set a deadline for submitting change requests before key decision points to minimize disruption.

2. Reviewing and Evaluating Change Requests:

- Establish a Change Review Board composed of key stakeholders (project manager, sponsor, technical experts) to review and evaluate requests.
- Define clear criteria for evaluating change requests, considering:
  - Alignment with project goals and objectives
  - Impact on scope, schedule, budget, and risks
  - Feasibility and cost-effectiveness
  - Impact on stakeholders and change management needs
- Define a decision-making process for approvals, rejections, or requests for further information. Document all decisions with clear justifications.

3. Implementing Approved Changes:

- Update the project scope baseline, schedule, budget, and risk register to reflect approved changes.
- Communicate the approved change to all stakeholders, including the rationale, impact, and implementation plan.
- Assign an implementation team responsible for executing the change according to the plan.
- Integrate change management activities to address stakeholder concerns and ensure smooth adoption of the change.

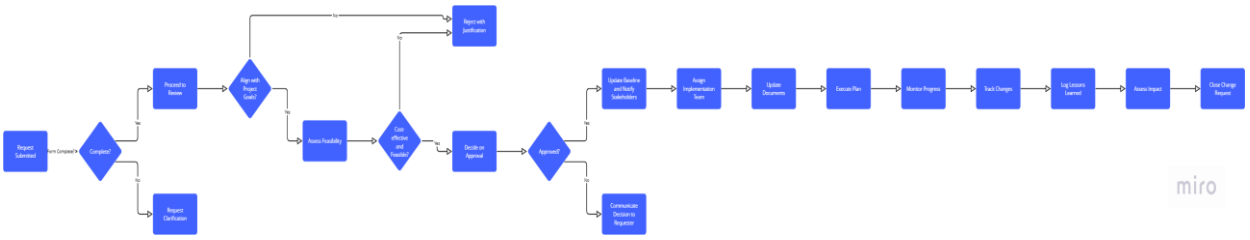
4. Monitoring and Tracking Changes:

- Maintain a log of all submitted change requests, including their status, decisions, and implementation progress.
- Monitor key project metrics to assess the impact of changes on overall project performance.

- Capture lessons learned from managing changes to inform future decision-making and continuous improvement.

Figure 6

Change Management Process



Note: Own work

4.2.15 **Conclusion**

This project scope statement provides a clear and concise definition of the scope of Optimization of Staffing for St. Lucia's Air Traffic Control Units project. The project manager will be responsible for ensuring that the project remains within the scope as defined in this document.

4.3 Schedule Management Plan

4.3.1 **Overview**

The purpose of this schedule management plan is to outline the project schedule and to define the processes for managing and controlling the project's timeline. This plan aims to ensure that the project is completed on time and within budget.

4.3.2 **Estimating Task Durations**

Expert judgment played a crucial role in estimating the duration of individual tasks for the project. The project manager identified experts with extensive experience and

knowledge in the relevant domains, including air traffic control operations and procedures, staffing planning and optimization, data analysis and human resource management. Through this process, expert opinions were collected, analyzed, and consolidated. This method leveraged valuable expertise and experience, and improved accuracy and reduced bias in estimates.

4.3.3 **Project Schedule**

The project manager developed a project schedule that met the project's objectives and constraints. This involved using scheduling software to create a Gantt chart as a visual representation of the project schedule.

Figure 7

Project Schedule

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		**1 Optimization of Staffing at St. Lucia's ATC Units**	**382 days**	**Tue 9/3/24**	**Wed 2/18/26**	
2		**1.1 Project Planning**	**105 days**	**Tue 9/3/24**	**Mon 1/27/25**	
3		**1.1.1 Define Project Objectives**	**20 days**	**Mon 11/18/2**	**Fri 12/13/24**	
4		1.1.1.1 Consult Stakeholders	10 days	Mon 11/18/2	Fri 11/29/24	
5		1.1.1.2 Develop Project Charter	10 days	Mon 12/2/24	Fri 12/13/24	4
6		1.1.1.3 Obtain Approval for Obj	5 days	Tue 12/3/24	Mon 12/9/24	5
7		**1.1.2 Develop Project Scope**	**15 days**	**Tue 12/10/2**	**Mon 12/30/24**	
8		1.1.2.1 Identify Deliverables	10 days	Tue 12/10/24	Mon 12/23/24	6
9		1.1.2.2 Set Boundaries	5 days	Tue 12/10/24	Mon 12/16/24	6
10		1.1.2.3 Gain Stakeholder Agree	10 days	Tue 12/17/24	Mon 12/30/24	9
11		**1.1.3 Identify Stakeholders**	**20 days**	**Tue 9/3/24**	**Mon 9/30/24**	
12		1.1.3.1 Develop Stakeholder Re	5 days	Tue 9/3/24	Mon 9/9/24	
13		1.1.3.2 Conduct Stakeholder An	5 days	Tue 9/10/24	Mon 9/16/24	12
14		1.1.3.3 Draft Communication Pl	10 days	Tue 9/17/24	Mon 9/30/24	13
15		**1.1.4 Create Project Schedule**	**20 days**	**Tue 12/31/2**	**Mon 1/27/25**	
16		1.1.4.1 Define Key Milestones	10 days	Tue 12/31/24	Mon 1/13/25	10
17		1.1.4.2 Allocate Resources	5 days	Tue 1/14/25	Mon 1/20/25	16
18		1.1.4.3 Develop Gantt Chart	5 days	Tue 1/21/25	Mon 1/27/25	17
19		**1.2 Project Launch**	**61 days**	**Tue 1/28/25**	**Tue 4/22/25**	**2**
20		**1.2.1 Secure Approvals**	**25 days**	**Tue 1/28/25**	**Mon 3/3/25**	
21		1.2.1.1 Approval for Resources	25 days	Tue 1/28/25	Mon 3/3/25	18
22		1.2.1.2 Approval for Plan	20 days	Tue 1/28/25	Mon 2/24/25	18
23		**1.2.2 Allocate Resources**	**25 days**	**Tue 3/4/25**	**Mon 4/7/25**	

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
24		1.2.2.1 Assign Project Roles	5 days	Tue 3/4/25	Mon 3/10/25	21
25		1.2.2.2 Procure Tools and Mate	25 days	Tue 3/4/25	Mon 4/7/25	21
26		**1.2.3 Conduct Kickoff Meeting**	**11 days**	**Tue 4/8/25**	**Tue 4/22/25**	
27		1.2.3.1 Introduce Project Team	3 days	Tue 4/8/25	Thu 4/10/25	25
28		1.2.3.2 Review Project Plan	8 days	Fri 4/11/25	Tue 4/22/25	27
29		**1.3 Analyze Current Staffing Levels and Workload**	**63 days**	**Wed 4/23/25**	**Fri 7/18/25**	**19**
30		**1.3.1 Gather Data on Staffing Lev**	**25 days**	**Wed 4/23/25**	**Tue 5/27/25**	
31		1.3.1.1 Collect Historical Staffin	10 days	Wed 4/23/25	Tue 5/6/25	19
32		1.3.1.2 Conduct Staff Interview	15 days	Wed 5/7/25	Tue 5/27/25	31
33		**1.3.2 Assess Current Workload**	**20 days**	**Wed 5/28/25**	**Tue 6/24/25**	
34		1.3.2.1 Analyze Task Allocation	10 days	Wed 5/28/25	Tue 6/10/25	32
35		1.3.2.2 Identify Overlaps and Ga	10 days	Wed 6/11/25	Tue 6/24/25	34
36		**1.3.3 Develop Staffing Analysis Re**	**18 days**	**Wed 6/25/25**	**Fri 7/18/25**	
37		1.3.3.1 Compile Findings	15 days	Wed 6/25/25	Tue 7/15/25	35
38		1.3.3.2 Highlight Gaps	15 days	Wed 6/25/25	Tue 7/15/25	35
39		1.3.3.3 Present to Stakeholders	3 days	Wed 7/16/25	Fri 7/18/25	37,38
40		**1.4 Identify Opportunities for Staffing Optimization**	**55 days**	**Wed 7/16/25**	**Tue 9/30/25**	
41		**1.4.1 Analyze Workload Distribut**	**20 days**	**Wed 7/16/25**	**Tue 8/12/25**	
42		1.4.1.1 Evaluate Peak and Off-Peak Workloads	10 days	Wed 7/16/25	Tue 7/29/25	38
43		1.4.1.2 Identify Opportunities for Redistribution	10 days	Wed 7/30/25	Tue 8/12/25	42

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
44		**1.4.2 Explore Efficiency Improven**	**10 days**	**Wed 7/16/25**	**Tue 7/29/25**	
45		1.4.2.1 Assess Automation Tool	5 days	Wed 7/16/25	Tue 7/22/25	38
46		1.4.2.2 Recommend Process Ch	5 days	Wed 7/23/25	Tue 7/29/25	45
47		**1.4.3 Conduct Benchmarking with Industry Standards**	**30 days**	**Wed 7/16/25**	**Tue 8/26/25**	
48		1.4.3.1 Research Best Practices	20 days	Wed 7/16/25	Tue 8/12/25	38
49		1.4.3.2 Compare Current Practi	10 days	Wed 8/13/25	Tue 8/26/25	48
50		**1.4.4 Develop Optimization Recommendations Report**	**25 days**	**Wed 8/27/25**	**Tue 9/30/25**	
51		1.4.4.1 Draft Recommendation	20 days	Wed 8/27/25	Tue 9/23/25	41,44,47
52		1.4.4.2 Review with Stakeholde	5 days	Wed 9/24/25	Tue 9/30/25	51
53		**1.5 Develop a Staffing Plan**	**60 days**	**Wed 10/1/25**	**Tue 12/23/25**	
54		**1.5.1 Define Staffing Goals**	**20 days**	**Wed 10/1/25**	**Tue 10/28/25**	
55		1.5.1.1 Set Quantitative Targets	10 days	Wed 10/1/25	Tue 10/14/25	40
56		1.5.1.2 Align with Organizationa	10 days	Wed 10/15/2	Tue 10/28/25	55
57		**1.5.2 Develop Training and Development Strategies**	**30 days**	**Wed 10/29/25**	**Tue 12/9/25**	
58		1.5.2.1 Identify Training Needs	5 days	Wed 10/29/2	Tue 11/4/25	56
59		1.5.2.2 Design Training Program	25 days	Wed 11/5/25	Tue 12/9/25	58
60		**1.5.3 Outline Recruitment Plans**	**15 days**	**Wed 10/29/2**	**Tue 11/18/25**	
61		1.5.3.1 Develop Job Description	10 days	Wed 10/29/2	Tue 11/11/25	56
62		1.5.3.2 Schedule Recruitment A	5 days	Wed 11/12/2	Tue 11/18/25	61
63		**1.5.4 Develop Staffing Plan Docu**	**10 days**	**Wed 12/10/2**	**Tue 12/23/25**	
64		1.5.4.1 Finalize Staffing Strateg	10 days	Wed 12/10/2	Tue 12/23/25	54,57,60

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
65		**1.6 Monitor Staffing Plan Effectiven**	**70 days**	**Wed 8/27/25**	**Tue 12/2/25**	
66		**1.6.1 Establish KPIs**	**20 days**	**Wed 8/27/25**	**Tue 9/23/25**	
67		1.6.1.1 Determine Metrics	5 days	Wed 8/27/25	Tue 9/2/25	49
68		1.6.1.2 Align KPIs	10 days	Wed 9/3/25	Tue 9/16/25	67
69		1.6.1.3 Document and Distribut	5 days	Wed 9/17/25	Tue 9/23/25	68
70		**1.6.2 Conduct Regular Performan**	**20 days**	**Wed 9/24/25**	**Tue 10/21/25**	
71		1.6.2.1 Data Collection	10 days	Wed 9/24/25	Tue 10/7/25	69
72		1.6.2.2 Monthly Review	10 days	Wed 9/24/25	Tue 10/7/25	69
73		1.6.2.3 Make Staffing Adjustme	10 days	Wed 10/8/25	Tue 10/21/25	72
74		**1.6.3 Develop M&E Framework**	**10 days**	**Wed 10/22/2**	**Tue 11/4/25**	
75		1.6.3.1 Create Data Collection F	10 days	Wed 10/22/2	Tue 11/4/25	73
76		1.6.3.2 Integrate Feedback	10 days	Wed 10/22/2	Tue 11/4/25	73
77		1.6.3.3 Automate Tracking and	10 days	Wed 10/22/2	Tue 11/4/25	73
78		**1.6.4 Develop M&E Report**	**20 days**	**Wed 11/5/25**	**Tue 12/2/25**	
79		1.6.4.1 Compile Data	20 days	Wed 11/5/25	Tue 12/2/25	39,74,70
80		1.6.4.2 Achievements, Obstacles and Solutions	20 days	Wed 11/5/25	Tue 12/2/25	39,74,70
81		**1.7 Evaluate Project Outcomes**	**56 days**	**Wed 12/3/25**	**Wed 2/18/26**	
82		**1.7.1 Assess Outcomes Against O**	**25 days**	**Wed 12/3/25**	**Tue 1/6/26**	
83		1.7.1.1 Measure Against KPIs	25 days	Wed 12/3/25	Tue 1/6/26	78
84		1.7.1.2 Conduct Review	25 days	Wed 12/3/25	Tue 1/6/26	78
85		1.7.1.3 Conduct Surveys	25 days	Wed 12/3/25	Tue 1/6/26	78
86		**1.7.2 Conduct Stakeholder Feedback Sessions**	**20 days**	**Wed 12/3/25**	**Tue 12/30/25**	
87		1.7.2.1 Schedule Sessions	5 days	Wed 12/3/25	Tue 12/9/25	78
88		1.7.2.2 Create Agenda	5 days	Wed 12/10/2	Tue 12/16/25	87
89		1.7.2.3 Document Insights	10 days	Wed 12/17/2	Tue 12/30/25	88
90		**1.7.3 Document Lessons Learned**	**13 days**	**Wed 12/31/2**	**Fri 1/16/26**	
91		1.7.3.1 Identify Positives	10 days	Wed 12/31/2	Tue 1/13/26	78,86
92		1.7.3.2 Develop Lessons Learne	10 days	Wed 12/31/2	Tue 1/13/26	78,86
93		1.7.3.3 Conduct Closure Meetir	3 days	Wed 1/14/26	Fri 1/16/26	92
94		**1.7.4 Finalize Project Report**	**23 days**	**Mon 1/19/26**	**Wed 2/18/26**	
95		1.7.4.1 Combine Findings	20 days	Mon 1/19/26	Fri 2/13/26	93
96		1.7.4.2 Include Deliverables	20 days	Mon 1/19/26	Fri 2/13/26	93
97		1.7.4.3 Submit Report	3 days	Mon 2/16/26	Wed 2/18/26	96

Note: Own work. Developed in Microsoft project

4.3.4 **Schedule Change Management**

Any changes to the project schedule must be approved by the project manager and the key stakeholders. The following change management process will be used to manage any changes to the project schedule:

- The change requestor will submit a written change request to the project manager.
- The project manager will assess the change request and determine the impact of the change on the project schedule, budget, and risk.
- The project manager will present the change request to the key stakeholders for approval.
- If the change request is approved, the project manager will update the project schedule, budget, and risk register.
- The project manager will implement the change and communicate the change to the project team and stakeholders.

4.3.5 **Conclusion**

This schedule management plan provides a framework for developing, monitoring, and controlling the project schedule. The project manager will be responsible for implementing this plan and for ensuring that the project is completed on time and within budget.

The project manager should regularly review and update the schedule management plan to ensure that it is effective and meets the needs of the project.

The project manager should communicate the schedule management plan to the project team and stakeholders.

The project manager should monitor the project's progress against the schedule and should make adjustments to the schedule as needed.

The project manager should manage any changes to the project schedule in accordance with the change management process.

4.4 Cost Management Plan

4.4.1 Overview

The purpose of this cost management plan is to outline the processes for estimating, budgeting, tracking, and controlling the project's costs. This plan aims to ensure that the project is completed within the approved budget. SLASPA will provide the financial support for the project. The project manager will have general oversight and will ensure that the project is completed within the approved budget.

4.4.2 Cost Estimation

The following methods will be used to estimate the project's costs:

- Expert judgment: The project manager will consult with experts in air traffic control and staffing optimization to estimate the costs of each task.
- Historical data: The project manager will review historical data from similar projects to estimate the costs of each task.

4.4.3 Project Budget

The project manager will develop a project budget by allocating the estimated costs to the project tasks. The project budget will be used to track project costs and identify any variances from the approved budget.

Chart 9

Project Budget

Task Name	Estimated Cost	Contingency
Project Initiation and Planning	$**20,000**	30% ($6,000)
Develop Project Management Plan	$10000	3000
Assemble Project Team	$6000	1800
Conduct Kickoff Meeting	$4000	1200
Data Collection and Analysis	**$48,000**	10% ($4,800)
Identify Data Sources	$4000	400
Collect Workforce Data	$10000	1000
Clean and Prepare Data	$12000	1200
Perform Exploratory Data Analysis	$18000	1800
Identify Areas for Improvement	$4000	400
Model Development and Evaluation	**$34,000**	30% ($10,200)
Develop Options	$20000	6000
Evaluate Options	$10000	3000
Selection of Model	$4000	1200
Implementation Planning and Design	**$69,000**	30% ($20,700)
Define Change Management Strategy	$10000	3000
Develop Implementation Plan	$14000	4200
Update Policies and Procedures	$10000	3000
Design Training Materials	$25000	7500
Develop Communications Strategy	$10000	3000
Pilot Testing	**$55,000**	20%($11,000)
Conduct Pilot Testing of New Model	$35000	7000
Collect and Analyze Pilot Test Data	$10000	2000
Evaluate Pilot Test Results	$10000	2000
Implementation and Roll Out	**$62,000**	20% ($12,400)
Implement New Model	$50000	10000
Address Initial Issues and Feedback	$12000	2400
Monitoring and Evaluating	**$43,000**	10% ($4,300)
Define KPIs	$8000	800
Implement Data Collection Processes	$9000	900
Analyze Data	$8000	800
Conduct Comparative Analysis	$8000	800
Prepare Performance Reports	$6000	600
Identify Areas for Improvement	$4000	400
Project Closure	**$12,000**	5% ($600)
Document Lessons Learned	$4000	200

Finalize Project Reports	$4000	200
Conduct Project Closure Meeting	$4000	200
Contingency Reserve	$70,000	
Baseline	$413,000	
Management Reserve	$20,650	5%
Total Project Budget	$433,650	

Note: Own Work

The contingency reserve was calculated using a structured approach to account for uncertainties and potential risks associated with each project phase. A percentage-based methodology was applied, with the contingency percentage tailored to the risk level of each major task or activity.

Each task or activity was assigned a contingency percentage based on its complexity, likelihood of unforeseen challenges, and associated risks. The percentages ranged from 5% to 30%, reflecting the varying levels of uncertainty. The percentages are reflected in the table.

The contingency reserve for each task was calculated by multiplying the estimated cost of the task by the assigned contingency percentage. The contingency reserves for all tasks were aggregated to determine the total contingency reserve.

4.4.4 **Control Costs**

The project manager will implement a cost control process to monitor and control project costs. This process will include:

- Regular cost tracking: The project manager will track project costs on an ongoing basis by comparing actual costs to budget estimates.

- Variance analysis: The project manager will analyze any variances between actual costs and budget estimates to determine the root cause of the variances.
- Corrective action: The project manager will take corrective action to address any cost variances. This may involve modifying the project scope, renegotiating contracts, or implementing cost-saving measures.

4.4.5 **Project Cost Monitoring**

`The project manager will use the following KPIs to measure project cost performance:

• Total project cost: The total cost of the project, including all labor, materials, travel, and overhead expenses.

• Cost per task: The average cost of completing each project task.

• Cost variance: The difference between actual costs and budget estimates.

• Cost performance index (CPI): A measure of project cost efficiency, calculated by dividing the earned value of the project by the actual cost of the project.

Earned Value Management (EVM)

The project manager will use EVM to track project progress and identify potential cost issues. EVM uses three key metrics:

• Planned Value (PV): The budgeted cost of completing each project task.

• Earned Value (EV): The value of the work that has been completed.

• Actual Cost (AC): The actual cost of completing the work.

The project manager can calculate the CPI and Cost Variance (CV) using the following formulas:

- CPI = EV / AC
- CV = EV - PV

A CPI of 1 indicates that the project is on track to meet its cost targets. A CPI greater than 1 indicates that the project is under budget, while a CPI less than 1 indicates that the project is over budget.

The CV measures the difference between the actual cost of the work and the budgeted cost of the work. A positive CV indicates that the project is under budget, while a negative CV indicates that the project is over budget.

By tracking these KPIs and using EVM, the project manager can identify potential cost issues early on and take corrective action to keep the project on track to meet its cost targets.

4.4.6 **Conclusion**

This cost management plan provides a framework for estimating, budgeting, tracking, and controlling the project's costs. The project manager will be responsible for implementing this plan and for ensuring that the project is completed within the approved budget.

The project manager should regularly review and update the cost management plan to ensure that it is effective and meets the needs of the project.

The project manager should communicate the cost management plan to the project team and stakeholders.

The project manager should monitor project costs closely and should take action to address any variances from what was budgeted.

The project manager should manage any changes to the project scope or schedule in accordance with the change management process.

4.5 Quality Management Plan

4.5.1 Overview

The purpose of this quality management plan is to outline the processes for planning, implementing, and controlling the quality of the project to Optimization of Staffing for St. Lucia's Air Traffic Control Units. This plan aims to ensure that the project meets the needs of stakeholders and that the deliverables are of high quality.

4.5.2 Quality Policy

The quality policy for this project is to:

- Deliver a staffing plan that is effective, efficient, and meets the needs of the air traffic control unit.
- Meet all project requirements and specifications.
- Complete the project within the approved budget and schedule.

4.5.3 Quality Objectives

The following quality objectives have been established for this project:

- Effectiveness: The staffing plan should be effective in reducing air traffic controller workload and improving safety.

- Efficiency: The staffing plan should be efficient in terms of cost and resource utilization.
- Compliance: The staffing plan should comply with all Civil Aviation regulations and air traffic control procedures.
- Timeliness: The project should be completed within the approved schedule.
- Budget: The project should be completed within the approved budget.

4.5.4 **Quality Standards**

The following quality standards have been established for this project:

- Project scope: The project scope should be clearly defined and should not be changed without the approval of the project manager and key stakeholders.
- Project schedule: The project schedule should be realistic and should be monitored and updated as needed.
- Project budget: The project budget should be realistic and should be tracked and controlled throughout the project lifecycle.
- Staffing plan: The staffing plan should be fair to air traffic controllers, should meet the needs of the air traffic control unit, and should comply with civil aviation regulations.
- Project documentation: Project documentation should be clear, concise, and complete.
- Data analysis: All data analysis should be conducted using sound statistical methods.

- Decision-making: All decisions should be based on evidence and should be made in a transparent manner.
- Communication: All communication should be clear, concise, and timely.

4.5.5 **Roles and Responsibilities**

Chart 11

Quality Roles and Responsibilities

Role	Responsibilities	Quality Expectations
Project Manager	- Oversees all aspects of project execution.	- Ensures the project is completed on time, within budget, and to the required quality standards.
Change Management Specialist	- Develops and implements a change management plan.	- Minimizes disruption to air traffic control operations and ensures a smooth transition to the new staffing model.
Human Resources Manager	- Develops and implements a recruitment plan.	- Recruits and hires qualified staff who meet the requirements of the new staffing model.
IT Manager	- Ensures technology infrastructure is reliable and secure.	- Provides technical support to the project team and ensures system availability throughout the project.
Subject Matter Experts	- Provide expertise and guidance on air traffic control procedures and regulations.	- Review project deliverables for accuracy and completeness.
Data Collectors	- Collect accurate and reliable data on current staffing levels and workload.	- Document data collection procedures and ensure data integrity.
Analysts	- Analyze collected data and identify opportunities for staffing optimization.	- Develop cost-benefit analysis of proposed changes.
Stakeholders	- Provide input and feedback on project plans and deliverables.	- Participate in project meetings and decision-making processes.

Note: Own work

4.5.6 **Quality Control**

The following quality control processes will be used to ensure that the project meets the quality objectives:

- Project reviews: Project reviews will be conducted at regular intervals to assess the project's progress, identify any issues, and take corrective action as needed.
- Inspections: Inspections will be conducted to ensure that deliverables meet the quality standards.
- Testing: Testing will be conducted to ensure that the staffing plan is effective and meets the needs of the air traffic control unit.
- Change management: A change management process will be used to manage any changes to the project scope, schedule, or budget.

Chart 12

Quality Control

Requirement	Quality Control Measures
Clearly define project scope	• Review scope description document: Ensure clarity, completeness, and alignment with stakeholders' expectations. • Verify alignment with business needs and objectives: Confirm the scope addresses identified workload reduction and operational efficiency goals. • Perform conflict analysis: Identify and resolve potential conflicts with existing projects or organizational policies.
Develop WBS	• Review scope description document: Ensure clarity, completeness, and alignment with stakeholders' expectations.

	• Verify alignment with business needs and objectives: Confirm the scope addresses identified workload reduction and operational efficiency goals. • Perform conflict analysis: Identify and resolve potential conflicts with existing projects or organizational policies.
Establish Scope Baseline	• Review scope description document: Ensure clarity, completeness, and alignment with stakeholders' expectations. • Verify alignment with business needs and objectives: Confirm the scope addresses identified workload reduction and operational efficiency goals. • Perform conflict analysis: Identify and resolve potential conflicts with existing projects or organizational policies.
Implement Scope Change Management Process	• Review scope description document: Ensure clarity, completeness, and alignment with stakeholders' expectations. • Verify alignment with business needs and objectives: Confirm the scope addresses identified workload reduction and operational efficiency goals. • Perform conflict analysis: Identify and resolve potential conflicts with existing projects or organizational policies.
Monitor and measure progress against scope baseline	• Review scope description document: Ensure clarity, completeness, and alignment with stakeholders' expectations. • Verify alignment with business needs and objectives: Confirm the scope addresses identified workload

	reduction and operational efficiency goals. • Perform conflict analysis: Identify and resolve potential conflicts with existing projects or organizational policies.
Verify that deliverables meet intended outcomes	• Review scope description document: Ensure clarity, completeness, and alignment with stakeholders' expectations. • Verify alignment with business needs and objectives: Confirm the scope addresses identified workload reduction and operational efficiency goals. • Perform conflict analysis: Identify and resolve potential conflicts with existing projects or organizational policies.

Note: Own Work

4.5.7 **Quality Assurance**

The following quality assurance activities will be conducted throughout the project lifecycle:

- Quality audits: Independent quality audits will be conducted to assess the effectiveness of the quality management system.
- Risk management: Risks to the quality of the project will be identified, assessed, and mitigated.
- Change management: Changes to the project scope or schedule will be managed in a controlled manner to minimize the impact on quality.

Chart 12

Quality Assurance

Requirement	Quality Assurance Measures
Clearly define project scope	• Independent review by project management expert: Verify adherence to best practices and industry standards for scope definition. • Stakeholder walkthrough: Facilitate a session for stakeholders to confirm their understanding and agreement with the scope boundaries.
Develop WBS	• Comparison with industry benchmarks: Analyze task breakdown and duration against similar projects to identify potential gaps or redundancies. • Simulation modeling: Utilize modeling tools to assess the feasibility and resource requirements of the proposed WBS.
Establish Scope Baseline	• Independent audit of baseline documentation: Verify completeness, accuracy, and adherence to project management standards. • Stress testing: Simulate potential challenges (budgetary constraints, resource limitations) to assess the stability of the baseline.
Implement Scope Change Management Process	• Review by change management expert: Assess compliance with industry best practices for change management in projects. • Mock audit of change request process: Test the effectiveness of the process in identifying, evaluating, and approving or rejecting changes.

Monitor and measure progress against scope baseline	• Independent review of progress reports: Verify data accuracy, objectivity, and alignment with the baseline. • Analysis of trend data: Identify deviations from projected progress and assess potential risks to scope delivery.
Verify that deliverables meet intended outcomes	• Independent review of deliverables: Confirm they meet quality standards, functional requirements, and industry best practices. • Audit of performance evaluation methodology: Assess the data collection, analysis, and reporting methods used in the evaluation.

Note: Own work

4.5.8 **Quality Improvement**

The following quality improvement activities will be conducted throughout the project lifecycle:

- Lessons learned: Lessons learned from previous projects will be incorporated into the project plan.
- Continuous improvement: The project team will continuously strive to improve the quality of the project.
- Benchmarking: The project team will benchmark the project against similar projects to identify areas for improvement.

4.5.9 **Conclusion**

This quality management plan provides a framework for planning, implementing, and controlling the quality of the project. The project manager is responsible for

implementing this plan and for ensuring that the project meets the quality objectives and standards.

The project manager should regularly review and update the quality management plan to ensure that it is effective and meets the needs of the project.

The project manager should communicate the quality management plan to the project team and stakeholders.

The project manager should monitor the quality of the project throughout the project lifecycle and take action to address any issues.

The project manager should manage any changes to the project scope or schedule in accordance with the change management process.

The project manager should ensure that all project deliverables meet the quality standards.

4.6 Resource Management Plan

4.6.1 Overview

The purpose of this resource management plan is to outline the processes for identifying, acquiring, and managing the resources required for the project. This plan aims to ensure that the project has the right people, equipment, and materials at the right time to complete the project successfully.

4.6.2 Resource Identification

The following resources will be required for the project to optimize staffing at an air traffic control unit:

Personnel:

- Air traffic controllers
- Project managers
- Analysts
- Data collectors
- Subject matter experts

Equipment:

- Computers
- Software
- Data analysis tools
- Communication tools
- Project management software

Materials:

- Data collection forms
- Data analysis reports
- Project documents
- Communication materials

Chart 13

Resource Identification

Resource	Engagement Start	Engagement Start	Engagement End	Justification

Project Manager	Project Initiation & Planning	Start	Project Closure	Leads overall project execution
Data Analyst	Data Collection & Analysis	Start	Model Development & Evaluation	Conducts data analysis and prepares models
Model Development Team	Model Development & Evaluation	Start	Implementation Planning & Design	Develops and evaluates staffing models
Change Management Lead	Implementation Planning & Design	Start	Implementation & Rollout	Leads change management strategy and training
Training Specialist	Implementation Planning & Design	Start	Implementation & Rollout	Develops and delivers training materials
Subject Matter Experts (SMEs), Air Traffic Controllers	Project Planning and Initiation	On-call	Project Closure	Provide expertise and feedback throughout
Project Sponsor/Steering Committee	Project Planning and Initiation	Start	Project Closure	Provides guidance, approves major decisions

Note: Own work

4.6.3 **Resource Acquisition**

The following methods will be used to acquire the resources required for the project:

- Internal sourcing: Resources will be sourced from within the organization whenever possible. This includes air traffic controllers, project managers, and analysts.

- External sourcing: Resources will be sourced from external vendors if they are not available internally. This includes data collectors, subject matter experts, and specialized equipment or software.
- Procurement: The procurement process outlined in the procurement management plan will be used to procure goods and services from external vendors.

4.6.4 **Resource Management**

The following methods will be used to manage the resources required for the project:

- Resource scheduling: The project manager will schedule resources to ensure that they are available when needed. This includes assigning tasks to project team members and scheduling the use of equipment and materials.
- Resource utilization tracking: The project manager will track resource utilization to identify any potential bottlenecks or underutilization of resources. This will involve monitoring task completion rates, equipment usage, and material consumption.
- Resource optimization: The project manager will optimize resource usage to ensure that they are used efficiently and effectively. This may involve reallocating resources, adjusting task schedules, or implementing new processes or technologies.

Effective resource management is vital for the success of the project. It ensures efficient utilization of personnel, technology, and other resources, contributing to project completion within budget and on schedule.

Here's a breakdown of key roles and responsibilities for resource management:

Chart 14

Resource Roles and Responsibilities

Role	Responsibility
Project Manager	• Overall responsibility for resource planning, allocation, and utilization. • Develops and maintains the resource management plan. • Identifies, acquires, and manages project resources. • Monitors resource usage and tracks performance against the plan. • Takes corrective actions to address resource issues and optimize allocation. • Reports on resource utilization to stakeholders.
Human Resources Manager	• Develops and implements a recruitment plan for project personnel. • Manages onboarding, training, and development of project team members. • Tracks employee performance and addresses any resource gaps. • Collaborates with the Project Manager on resource allocation and utilization.
IT Manager	• Identifies and secures required technology resources (hardware, software, licenses). • Manages installation, configuration, and maintenance of IT infrastructure. • Provides technical support to the project team. • Collaborates with the Project Manager on resource allocation and utilization.
Subject Matter Experts (SMEs)	• Provide expertise and guidance on air traffic control operations and procedures.

	• Identify and recommend resource needs for their specific areas. • Participate in resource planning and allocation discussions. • Assist with training and development of project team members.
Data Collectors	• Collect accurate and reliable data on current staffing levels and workload. • Document data collection procedures and ensure data integrity. • Communicate any resource challenges encountered during data collection.
Analysts	• Analyze collected data to identify opportunities for staffing optimization. • Identify potential resource requirements for data analysis and modeling. • Communicate findings and recommendations to the project team.
Finance Department	• Manages project budget and tracks resource expenditures.
Risk Management Specialist	• Identifies and mitigates potential resource-related risks.
Change Management Specialist	• Supports smooth transition and adoption of new staffing model, managing any resource-related challenges.
Stakeholders	• Provide input and feedback on resource allocation and utilization. • Participate in decision-making processes regarding resource management. • Ensure resources are aligned with project objectives and priorities.

Note: Own work

4.6.5 **Resource Risk Management**

The following resource risks will be identified and mitigated:

- Resource availability: The project manager will assess the availability of resources and develop contingency plans in case resources are not available when needed. This includes identifying potential substitutes for unavailable resources and developing plans for how to work around resource shortages.
- Resource skills: The project manager will ensure that project team members have the necessary skills to perform their tasks. This includes assessing the skills of existing team members, providing training or development opportunities, and hiring or contracting with individuals who possess the required skills.
- Resource cost: The project manager will monitor resource costs and take action to manage costs within the project budget. This includes tracking resource expenses, identifying cost-saving opportunities, and making adjustments to the project scope or schedule if necessary.

4.6.6 **Resource Communication**

The project manager will communicate resource management activities to stakeholders on a regular basis. This communication will include information about the status of resource allocation, the risks associated with resource management, and any changes to the resource management plan. This communication should be clear, concise, and timely, and it should be tailored to the needs of the specific stakeholders.

Chart 15

RACI Matrix

Task	Responsible (R)	Accountable (A)	Consulted (C)	Informed (I)
Project Initiation	Project Manager	Project Manager	Stakeholders	Project Team
Project Planning	Project Manager	Project Manager	Project Team, Stakeholders	Project Sponsor
Data Collection	Data Collectors	Project Manager	Subject Matter Experts	Human Resources
Data Analysis	Analysts	Project Manager	Subject Matter Experts	Data Collectors
Develop Staffing Plan	Analysts, Human Resources	Project Manager	Change Management Specialist, Subject Matter Experts	Stakeholders
Implement Staffing Plan	Human Resources, Change Management Specialist	Project Manager	IT Manager, Subject Matter Experts	Project Team, Stakeholders
Monitor Staffing Plan Effectiveness	Project Manager, Analysts	Project Manager	Stakeholders	Project Team
Evaluate Project Outcomes	Project Manager	Project Sponsor	Stakeholders	Project Team
Budget Management	Project Manager	Project Sponsor	Finance Department	Project Team
Risk Management	Project Manager	Project Sponsor	Risk Management Specialist	Project Team
Stakeholder Communication	Project Manager	Project Sponsor	Stakeholders	Project Team
Quality Management	Project Manager	Project Sponsor	Quality Assurance Specialist	Project Team
Change Management	Change Management Specialist	Project Manager	Project Team, Stakeholders	Human Resources
Training	Human Resources, Training Specialist	Project Manager	Change Management Specialist	Project Team

Documentation	Project Manager	Project Sponsor	Project Team	Stakeholders
Reporting	Project Manager	Project Sponsor	Stakeholders	Project Team

Note: Own work

4.6.7 **Conclusion**

This resource management plan provides a framework for identifying, acquiring, and managing the resources required for the project to optimize staffing at an air traffic control unit. The project manager is responsible for implementing this plan and for ensuring that the project has the right people, equipment, and materials at the right time to complete the project successfully.

The project manager should regularly review and update the resource management plan to ensure that it is effective and meets the needs of the project.

The project manager should communicate the resource management plan to the project team and stakeholders and should seek their input and feedback throughout the project lifecycle.

4.7 Communications Management Plan

4.7.1 **Overview**

The purpose of this communication management plan is to outline the communication strategies and channels that will be used to keep stakeholders informed throughout the project lifecycle. This plan aims to ensure that all stakeholders are kept up to date on project progress, decisions, and any potential issues that may arise.

4.7.2 **Target Audience**

The target audience for this project's communication includes:

- Air traffic controllers
- Air traffic control management
- Eastern Caribbean Civil Aviation Association (ECCAA)
- Civil Aviation Association
- Project team members

4.7.3 **Communication Objectives**

The primary objectives of this communication management plan are to:

- Ensure that all stakeholders are informed about the project's goals, scope, and progress.
- Facilitate open and transparent communication between the project team and stakeholders.
- Address any concerns or questions that stakeholders may have about the project.
- Maintain stakeholder engagement and support throughout the project lifecycle.

4.7.4 **Communication Channels**

The following communication channels will be used to disseminate information to stakeholders:

- Regular project status meetings: These meetings will be held bi-weekly to provide updates on project progress, discuss any challenges, and address stakeholder concerns.

- Weekly email updates: These updates will summarize key project activities, decisions, and upcoming milestones.
- Project website: A dedicated project website will be created to provide stakeholders with access to project documents, presentations, and contact information.
- Instant messaging platforms: Instant messaging platforms such as Slack or Microsoft Teams will be used for real-time communication between project team members and stakeholders.
- One-on-one meetings: One-on-one meetings with key stakeholders will be scheduled as needed to discuss specific concerns or issues.

4.7.5 **Communication Frequency**

The frequency of communication will vary depending on the stage of the project and the level of stakeholder involvement. However, the following general guidelines will be followed:

- During the project planning phase, communication will be frequent to ensure that all stakeholders are on the same page and have input into the project's direction.
- During the project implementation phase, communication will be regular to keep stakeholders informed of progress, address any concerns, and gather feedback.
- During the project closure phase, communication will be less frequent but still maintained to provide stakeholders with a final project report and address any remaining questions or concerns.

4.7.6 **Communication Responsibilities**

Here is a breakdown of key roles and responsibilities as it pertains to communication on this project:

Chart 16

Communication Roles and Responsibilities

Role	Responsibilities
Project Manager	• Overall responsibility for project communication strategy and execution. • Develops and maintains a communication plan outlining communication goals, target audiences, channels, frequency, and key messages. • Facilitates regular project meetings and updates. • Communicates project progress, challenges, and decisions to stakeholders. • Manages communication risks and ensures effective information flow throughout the project. • Prepares and delivers presentations and reports to stakeholders.
Change Management Specialist	• Develops and implements a change management plan to address communication needs related to the staffing model transition. • Creates awareness and understanding of the project's impact on air traffic control personnel. • Provides clear and consistent information about the new staffing model and its benefits. • Addresses concerns and questions from stakeholders through various communication channels.

	• Facilitates open dialogue and feedback mechanisms.
Human Resources Manager	• Communicates recruitment and onboarding processes for new hires. • Provides information about training and development opportunities related to the new staffing model. • Addresses questions and concerns from staff regarding changes to their roles and responsibilities. • Disseminates important information about benefits and compensation changes.
Subject Matter Experts	• Present information about air traffic control procedures and regulations to stakeholders. • Answer technical questions related to the staffing model and its implementation. • Facilitate training sessions for project team members and air traffic control personnel. • Prepare and deliver presentations and reports about project findings and recommendations.
Data Collectors and Analysts	• Communicate any challenges or issues encountered during data collection and analysis. • Present data visualizations and key findings to relevant stakeholders. • Respond to inquiries and provide clarifications regarding data collection methods and analysis results.
Stakeholders	• Provide feedback on project communications and information received. • Raise concerns and questions through established channels. • Actively participate in project meetings and discussions.

	• Disseminate project information within their respective teams and networks.

Note: Own work

4.7.7 **Communications Matrix**

Chart 17

Communications Matrix

Target Audience	Purpose of Communication	Frequency	Method	Responsible Party
Project Sponsor and Steering Committee	- Project updates and status reports	Bi-weekly meetings	Reports, presentations	Project Manager
	- Key decisions and milestones	As needed	Meetings, emails	Project Manager
	- Escalation of issues and risks	As needed	Meetings, emails	Project Manager
Air Traffic Control Team	- Project overview and benefits	Project launch meeting	Presentation, Q&A session	Project Manager, Change Management Lead
	- Progress updates and changes impacting operations	Monthly meetings	Presentations, newsletters	Project Manager, Implementation Team
	- Training materials and schedules	Pre-training sessions	E-learning modules, webinars	Training Development Team
	- Addressing concerns and feedback	As Needed	Meetings	Change Management Lead, Project Manager
Management	- Project overview and impact on overall operations	Project launch meeting	Presentation, Q&A session	Project Manager, Sponsor
	- Key decisions and progress updates	Quarterly meetings	Reports, presentations	Project Manager
	- Addressing concerns and seeking support	As needed	Meetings, emails	Project Manager

Stakeholders	- Project overview and goals	Project launch Meeting	Presentation, Q&A session	Project Manager, Sponsor
	- Key milestones and achievements	Quarterly updates	Press releases, website announcements	Communication Team
	- Addressing major concerns and feedback	As needed	Public forums, media inquiries	Communication Team, Project Manager
Project Team	- Daily tasks and coordination	Daily stand-up meetings	Online collaboration tools	Project Manager, Team Leads
	- Project updates and challenges	Weekly team meetings	Presentations, discussion	Project Manager, Team Leads
	- Sharing knowledge and best practices	Ongoing	Internal communication channels, workshops	Project Manager, Team members

Note: Own work

4.7.8 **Evaluation and Measurement**

The effectiveness of the communication plan will be evaluated based on the following criteria:

- Stakeholder satisfaction: Stakeholders will be surveyed to assess their level of satisfaction with the communication they are receiving.
- Timeliness of information: Stakeholders will be assessed on their ability to access project information in a timely manner.
- Clarity of information: Stakeholders will be assessed on their understanding of project information and their ability to provide constructive feedback.
- Resolution of issues: The time taken to resolve stakeholder concerns or issues will be tracked.

4.7.9 **Conclusion**

This communication management plan will be reviewed and updated as needed throughout the project lifecycle to ensure that it remains effective in meeting the needs of all stakeholders.

The project manager should regularly review and update the communication management plan to ensure that it is effective and meets the needs of the project.

The project manager should communicate the communication management plan to the project team and stakeholders.

The project manager should monitor stakeholder feedback and adjust the communication strategy as needed.

The project manager should document all communication activities and outcomes.

4.8 Risk Management Plan

4.8.1 **Overview**

The purpose of this risk management plan is to identify, assess, and mitigate the risks associated with the Optimization of Staffing for St. Lucia's Air Traffic Control Units project.

4.8.2 **Risk Identification**

The following are some of the potential risks associated with this project:

- Resistance to change from air traffic controllers.
- Difficulty in identifying opportunities for staffing optimization.
- Delays in training new controllers may impact the optimization timeline.
- Unexpected changes in air traffic volume.

- Delays in obtaining ECCAA approval of the staffing plan.
- Negative impact on air traffic safety.
- Changes in aviation regulations affecting staffing requirements.

4.8.3 **Risk Assessment**

Chart 18

Risk Assessment (Source: Author)

Identified Risk Category	Identified Risk	Probability	Impact
Project Management Risks	Scope Creep and Changing Requirements	High (Unclear project scope, evolving stakeholder expectations)	High (Project delays, budget overruns, decreased quality of deliverables)
	Schedule Delays	Moderate (Underestimated complexity, unforeseen challenges)	High (Missed deadlines, increased costs, reduced project benefits)
	Cost Overruns	Moderate (Underestimated complexity, unforeseen challenges)	High (Increased costs, reduced project benefits)
	Ineffective Communication and Stakeholder Management	Moderate (Limited communication channels, diverse stakeholder needs)	Moderate (Misunderstandings, delays, lack of buy-in and support)
	Resource Shortages and Skill Gaps	Moderate (Competitive labor market, specialized skill requirements)	Moderate (Project delays, reduced quality, reliance on external resources)
Change Management Risks	Resistance to Change from Air Traffic Control Personnel	Moderate (Fear of job loss, uncertainty about the new model)	High (Low morale, decreased productivity, sabotage efforts)
	Lack of Awareness and Understanding	High (Inadequate communication and	High (Misconceptions,

	of the New Staffing Model	training, complex model)	resistance to adoption, user errors)
	Difficulty in Implementing and Adapting to New Workflows	Moderate (Technical challenges, existing routines, lack of support)	High (Operational disruptions, reduced efficiency, user frustration)
	Morale Issues and Decreased Job Satisfaction	Moderate (Increased workload, concerns about job security)	High (High turnover, absenteeism, decreased performance)
Data and Analysis Risks	Inaccurate or Incomplete Data Leading to Flawed Conclusions	Moderate (Data quality issues, limitations in data collection)	High (Misinformed decisions, inefficient staffing model, negative impacts)
	Difficulty in Collecting and Analyzing Real-world Data	High (Sensitive data, complex operational environment)	Moderate (Limited data availability, inaccurate model predictions)
	Bias in Data Collection and Analysis Methods	Moderate (Subjective interpretations, unconscious biases)	Moderate (Unrepresentative data, inaccurate conclusions)
	Uncertainty and Lack of Confidence in the Proposed Staffing Model	Moderate (Model complexity, limited validation)	Moderate (Hesitation to implement, resistance to change)
Technical Risks	Issues with Technology Implementation and Integration	Moderate (Compatibility issues, system glitches)	High (Operational disruptions, data security breaches, project delays)
	System Compatibility and Data Security Concerns	Moderate (Legacy systems, evolving cyber threats)	(Data breaches, system malfunctions, reputational damage)
	Technical Challenges and Delays	Moderate (Emerging technologies,	High (Increased costs, project delays, technical limitations)

		complex integrations)	
Human Resource Risk	Difficulty Recruiting and Retaining Qualified Personnel	High (Competitive market, specialized skills required)	Moderate (Project delays, knowledge gaps, reliance on temporary staff)
	Training and Development Challenges for New Hires	Moderate (Extensive training needs, rapid onboarding)	Moderate (Performance issues, low productivity, lack of confidence)
	Issues with Employee Morale and Motivation	Moderate (Increased workload, job uncertainty)	High (Reduced productivity, absenteeism, high turnover)
	Potential for Conflicts and Disagreements Between Staff	Moderate (Resistance to change, diverse perspectives)	Moderate (Disruptive work environment, decreased collaboration)

Note: Own work

4.8.4 **Risk Roles and Responsibilities**

Effective risk management requires clear roles and responsibilities for everyone involved in the project. Here's a detailed breakdown of key roles and their corresponding risk responsibilities:

Chart 19

Risk Roles and Responsibilities

Role	Responsibilities
Project Manager	• Overall responsibility for project risk management. • Develops and implements a comprehensive risk management plan. • Identifies, assesses, and prioritizes potential risks.

	• Assigns risk owners and develops mitigation strategies. • Monitors and tracks risk progress and effectiveness of mitigation actions. • Reports on risk status to stakeholders and communicates risk updates. • Escalates high-impact risks and facilitates resolution processes.
Risk Owner	• Assigned ownership for specific risks based on expertise and responsibility. • Develops and implements detailed mitigation plans for assigned risks. • Monitors and tracks assigned risks and updates the risk register regularly. • Identifies and manages emerging risks related to their area of responsibility. • Communicates risk updates and concerns to the project manager. • Implements mitigation actions and monitors their effectiveness.
Project Team Members	• Participate in risk identification. • Contribute knowledge and expertise to risk analysis and mitigation planning. • Assist assigned risk owners with implementing mitigation actions. • Report any new or emerging risks they encounter during project execution. • Participate in risk management training and awareness programs.
Change Management Specialist	• Identifies and assesses change-related risks associated with implementing the new staffing model. • Develops mitigation strategies to address resistance to change, lack

	of awareness, and difficulties in adapting to new workflows. • Provides training and support to staff during the transition to the new model. • Monitors and addresses morale issues and concerns related to change.
Human Resources Manager	• Identifies and assesses human resource-related risks, such as recruitment, training, and retention challenges. • Develops mitigation strategies to attract and retain qualified personnel. • Manages training and development programs for new hires and existing staff. • Addresses employee concerns and issues related to the new staffing model. • Monitors employee morale and identifies potential conflicts or disagreements.
Subject Matter Experts (SMEs)	• Provide technical expertise and insights to identify and assess technical risks. • Participate in risk analysis and mitigation planning for technical challenges. • Assist in developing and implementing mitigation strategies for technical risks. • Monitor and track technical risks and communicate any emerging issues promptly.
IT Manager	• Identifies and assesses technology-related risks associated with system implementation and integration. • Develops mitigation strategies to address compatibility issues, data security concerns, and potential technical challenges.

	• Manages system implementation and integration processes. • Monitors system performance and addresses any technical glitches or bugs. • Provides technical support to project team members and stakeholders.
Stakeholders	• Participate in risk identification and assessment. • Provide feedback and insights on potential risks and mitigation strategies. • Remain informed about project risks and their potential impact. • Support the project team in implementing risk mitigation actions. • Escalate any major concerns or issues related to project risks.
Finance Department	• Identifies and mitigates financial risks associated with project budget and resource allocation.
Legal Department	• Advises on legal and regulatory risks related to the new staffing model.

Note: Own work

4.8.5 **Risk Owners**

Chart 20

Risk Owners

Risk ID	Risk Description	Risk Owner	Rationale
1	Scope creep and changing requirements	Project Manager	Ultimately responsible for managing project scope and ensuring alignment with stakeholder needs.
2	Delays in schedule and budget overruns	Project Manager	Responsible for overseeing project schedule and budget adherence, requiring proactive management of

			resource allocation and mitigating delays.
3	Ineffective communication and stakeholder management	Stakeholder Management Lead	Owns the communication strategy and stakeholder engagement process, ensuring effective communication and addressing concerns.
4	Resource shortages and skill gaps	Human Resources Manager	Responsible for workforce planning, recruitment, and training, needing to identify and address skill gaps promptly.
5	Resistance to change from air traffic control personnel	Air Traffic Control Management Team	Directly responsible for implementing the new model and addressing concerns from air traffic controllers.
6	Lack of awareness and understanding of the new staffing model	Project Communications Lead	Responsible for developing and disseminating clear information materials and conducting training programs to ensure understanding.
7	Difficulty in implementing and adapting to new workflows	IT Manager	In charge of system implementation and technical support, requiring proactive identification and resolution of workflow challenges.

Note: Own work

4.8.6 **Qualitative Risk Analysis**

Qualitative risk analysis was undertaken to assess the likelihood and impact of risks associated with this project. The first step in the qualitative analysis was to identify the potential risk on the project. Next, the likelihood of occurrence was categorized as low, moderate or high based on expert judgement. Thirdly, the impact of the risk, if it were to occur, was evaluated based on the potential consequences for cost, schedule and quality. Finally, the risk score was calculated by multiplying scores for likelihood and impact.

Scoring:

High – 3

Moderate – 2

Low – 1

Chart 21

Qualitative Risk Analysis

Risk ID	Risk Description	Likelihood	Impact	Risk Score
1	Scope creep and changing requirements	High	High	9
2	Delays in schedule and budget overruns	Moderate	High	6
3	Ineffective communication and stakeholder management	Moderate	Moderate	4
4	Resource shortages and skill gaps	Moderate	Moderate	4
5	Resistance to change from air traffic control personnel	High	Moderate	6
6	Lack of awareness and understanding of the new staffing model	Moderate	Moderate	4
7	Difficulty in implementing and adapting to new workflows	Moderate	High	6

Note: Own work

4.8.7 **Risk Register**

A risk register is a crucial tool in project management that helps identify, assess, and manage potential risks that could impact the successful completion of a project. The value of a risk register lies in its ability to systematically address and mitigate uncertainties that may arise throughout the project lifecycle. This risk register provides a platform for developing strategies to mitigate or respond to identified risks. This includes defining proactive measures to reduce the probability or impact of a risk and planning reactive responses if the risk materializes. It also allows for continuous monitoring of identified risks and their associated mitigation plans. Regular updates ensure that the project team

remains aware of changing circumstances and can adapt strategies as needed. At the completion of the project, it will become a valuable resource for lessons learned.

Figure 8:
Risk Register Scores

Risk Register Scores

Score	Priority	Key/Code
.01 - .07	Low	
.08 - .20	Medium	
.24 and above	High	

Probability and Impact Matrix Showing Risk Score (Probability x Impact)

		Threats					Opportunities				
Probability	0.90 V. High	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09	0.05
	0.70 High	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04
	0.50 Med	0.03	0.05	0.10	0.20	0.40	0.40	0.20	0.10	0.05	0.03
	0.30 Low	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06	0.03	0.02
	0.10 V. Low	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.02	0.01	0.01
		0.05 V.low	0.10 Low	0.20 Mod	0.40 High	0.80 V.H	0.80 V.H	0.40 High	0.20 Mod	0.10 Low	0.05 V. low
		Negative Impact									Positive Impact

Note: Reproduced from Project Operations Manual, SLASPA (2024)

The Risk Register for this project is a comprehensive tool designed to identify, assess, and manage both threats and opportunities that may impact the project's success. By including potential challenges and positive risks, the register ensures a balanced approach to risk management, enabling proactive mitigation of threats and strategic capitalization on opportunities. This dual focus supports informed decision-making, enhances project resilience, and maximizes the potential for achieving project objectives effectively.

Chart 22

Risk Register

Risk ID	Risk Description		Probability	Impact	Risk Score	Mitigation Strategies	Monitoring Plan
1	Scope creep and changing requirements: Project scope expands beyond initial definition, leading to delays and budget overruns.		High (0.7)	High (0.4)	High (0.28)	*Clearly define project scope and objectives in a detailed scope document. *Obtain stakeholder agreement and commitment to the defined scope. * Implement a formal change management process for any proposed scope changes. * Regularly communicate project progress and address any potential scope changes proactively.	* Review scope documentation and stakeholder agreements regularly. * Monitor project deliverables and milestones against the agreed-upon scope. * Track and report changes in scope and their impact on project schedule and budget.
2	Schedule delays		Medium (0.5)	High (0.4)	Medium (0.2)	* Develop a comprehensive project schedule with realistic timelines and milestones. * Develop contingency plans for unexpected events and delays.	* Monitor project progress against the schedule and budget baseline. * Track resource utilization and identify potential bottlenecks.
3	Ineffective communication and stakeholder		Medium (0.5)	Moderate (0.2)	Medium (0.1)	* Develop and implement a communication	* Monitor stakeholder satisfaction

	management: Inadequate communication or lack of engagement with stakeholders leads to misunderstandings, resistance to change, and project delays.					plan outlining communication channels, frequency, and target audiences. * Establish regular meetings and update mechanisms for stakeholders. * Encourage open communication and address concerns promptly. * Utilize diverse communication channels to cater to different stakeholder preferences. * Actively engage stakeholders in project decisions and provide feedback opportunities.	through surveys and feedback mechanisms. * Track communication frequency and effectiveness across different stakeholder groups. * Analyze stakeholder feedback and adjust communication strategies as needed.
4	Resource shortages and skill gaps: Difficulty in recruiting and retaining qualified personnel with necessary skills and experience to implement the new staffing model.		Medium (0.5)	Moderate (0.2)	Medium (0.1)	* Conduct workforce planning and identify potential skills gaps early. * Develop proactive recruitment strategies and attract qualified personnel. * Implement training and development programs to bridge skill gaps. * Consider outsourcing or contracting specialized resources if	* Monitor recruitment progress and track staffing levels against project requirements. * Analyze training effectiveness and identify skill gaps needing further development. * Track employee turnover and retention rates.

						necessary. * Promote knowledge sharing and cross-training within the project team.	
5	Resistance to change from air traffic control personnel: Concerns about job security, workload, and career development lead to resistance from air traffic controllers, hindering project implementation.		Medium(0.5)	Very High (0.8)	High (0.4)	* Engage air traffic controllers early in the change process and provide clear explanations. * Address concerns and anxieties openly and transparently. * Emphasize the benefits and positive outcomes of the new staffing model. * Provide comprehensive training and support during the transition period. * Encourage communication and feedback from air traffic controllers throughout the process.	* Conduct surveys and focus groups to gauge employee sentiment and identify concerns. * Track employee morale and engagement during the transition period. * Monitor the rate of adoption and adherence to the new model.
6	Lack of awareness and understanding of the new staffing model: Insufficient understanding of the new model among air traffic controllers and stakeholders		High (0.7)	Moderate (0.2)	Medium (0.14)	* Develop clear and concise communication materials about the new model. * Conduct comprehensive training programs for all staff impacted by the change. * Provide readily accessible	* Track the level of awareness and understanding of the new model among different stakeholder groups. * Monitor the number of questions and requests for clarification

	leads to confusion and challenges during implementation.					information resources and FAQs. * Encourage staff to ask questions and seek clarification. * Pilot the new model in a controlled environment and gather feedback.	regarding the new model. * Analyze feedback from pilots and address any areas of confusion.
7	Difficulty in implementing and adapting to new workflows: Technical challenges and resistance to change make it difficult for air traffic controllers to adapt to new workflows under the new model.		Medium (0.5)	High (0.4)	Medium (0.2)	* Design user-friendly and intuitive workflows for the new model. * Provide ongoing support and assistance during the implementation phase. * Address technical challenges and system issues promptly. * Gather feedback and iterate on workflows based on user experience. * Promote collaboration and peer-to-peer learning among air traffic controllers.	* Monitor the adoption rate of new workflows and identify areas of difficulty. * Track the number of technical support requests and incident reports related to the new workflows. * Conduct user satisfaction surveys to assess the effectiveness and ease of use of new workflows.
8	Delays in regulatory approvals from ECCAA		Medium (0.5)	High (0.4)	Medium (0.2)	Engage ECCAA early in the project lifecycle	Monthly meetings with ECCAA during project implementation
9	Budget overruns		Medium (0.5)	Very High (0.8)	High (0.4)	Accurately estimate resource requirements and project costs. * Implement	Analyze project variances and take corrective actions to stay on track. * Conduct

						effective cost monitoring and control processes.	regular budget reviews and update cost estimates as needed.
10	Limited training resources for ATCOs		High (0.7)	High (0.4)	High (0.28)	Secure training resources and trainers from outside of the region	Review available training resources monthly
11	Unclear project objectives		Medium (0.5)	Moderate (0.2)	Medium (0.10)	Conduct regular planning meetings; document objectives clearly	Review project objectives every 3 months for relevancy
12	Inefficient coordination amongst internal departments		Medium (0.5)	High (0.4)	Medium (0.20)	Define roles and responsibilities; hold inter-departmental briefings regularly	Monitor departmental collaboration monthly
14	Increase in training costs		Medium (0.5)	Moderate (0.2)	Medium (0.10)	Monitor training costs closely; adjust budget allocation if necessary	Monthly cost analysis
15	Unforeseen regulatory changes		Low (0.3)	Moderate (0.2)	Low (0.06)	Monitor updates from regulator; adjust project scope as needed	Conduct impact assessment for changes in regulation
16	Slow decision-making process		High (0,7)	Moderate (0.2)	Medium (0.14)	Assign decision-making authority to project manager for timely response	Monitor project milestones monthly
17	Negative public perception due to delays in improvements		Medium (0.5)	Moderate (0.2)	Medium (0.1)	Develop a public communications plan; address concerns openly	Quarterly public relations review
18	Poor documentation practices		Medium (0.5)	Moderate (0.2)	Medium (0.1)	Implement standardized documentation protocols	Quarterly documentation audits

19	Underestimation of project timelines		Medium (0.5)	Moderate (0.2)	Medium (0.1)	Set realistic timelines; include buffers for unexpected delays	Monitor schedule for variances
20	Communications breakdown in multi-disciplinary teams		Medium (0.5)	High	High	Schedule regular inter-team meetings; promote open communication channels	Fortnightly coordination meetings
21	Early completion of project milestones		Medium (0.5)	High (0.4)	Medium (0.20)	Optimize resource allocation to maintain pace and identify opportunities to accelerate subsequent tasks.	Conduct weekly progress reviews and compare actual progress against the project schedule.
22	Stakeholder alignment and strong support		High (0.7)	High (0.4)	High (0.28)	Engage stakeholders regularly through updates and consult them for their input to maintain alignment.	Monitor stakeholder feedback through surveys and regular meetings to identify and address emerging concerns.
23	Identification of new technologies to streamline staffing		Medium (0.5)	High (0.4)	Medium (0.2)	Research and evaluate technologies that support efficiency, and allocate budget for testing viable solutions.	Monitor technology trends and pilot implementation to assess impacts.
24	Access to additional funding for project expansion		Low (0.3)	Moderate (0.2)	Low (0,06)	Prepare a proposal for potential additional funding and highlight how it aligns with long-term organizational goals.	Track funding opportunities through SLASPA's finance team and relevant external agencies.
25	Positive media coverage		Medium (0.5)	Moderate (0.2)	Medium (0.10)	Develop a proactive communication	Track media reports and public sentiment,

	enhancing public support					strategy to share project milestones and benefits with the public.	and adjust the strategy based on feedback.

Note: Own work

4.8.8 **Conclusion**

This risk management plan provides a framework for identifying, assessing, and mitigating the risks associated with the Optimization of Staffing for St. Lucia's Air Traffic Control Units project. The project manager will be responsible for implementing this plan and for ensuring that the risks are managed effectively.

The project manager should communicate the risk management plan to the project team and stakeholders.

The project manager should regularly review and update the risk management plan to ensure that it is effective and meets the needs of the project.

The project manager should monitor the project's risks throughout the project lifecycle and make adjustments to the risk mitigation strategies as needed.

4.9 Procurement Management Plan

4.9.1 Overview

This procurement management plan outlines the approach for acquiring goods and services necessary for the successful implementation of the project. It defines procurement objectives, strategies, and procedures to ensure efficient and cost-effective procurement practices.

4.9.2 Procurement Objectives

The objectives of this procurement management plan are:

- Obtain goods and services that meet project requirements.
- Ensure timely delivery within budget constraints.
- Promote competition and maintain transparency in procurement processes.
- Support ethical and responsible sourcing practices.
- Build strong relationships with reliable and qualified suppliers.

4.9.3 Procurement Strategies

The following procurement strategy will be used for this project:

- Identify and analyze project requirements for goods and services.
- Develop clear and concise specifications for each procurement item and document these specifications in a TOR.
- Conduct market research to identify potential suppliers.
- Utilize competitive bidding processes to obtain the best value for money in congruence with SLASPA's procurement policy.

- Negotiate contract terms and conditions to ensure favorable outcomes.
- Implement performance monitoring and evaluation mechanisms for suppliers.
- Maintain open communication and collaboration with stakeholders throughout the procurement process.

4.9.4 **Procurement Procedure**

The following procedure will guide the procurement process:

- Develop and implement a standardized procurement process for all project-related purchases, this process should be identical to SLASPA's existing procurement policy.
- Define approval thresholds for different procurement levels. As per the current policy at SLASPA, the project manager can approve expenditure up to $9,999. Expenditure $10,000 and above must be escalated to the General Manager.
- Utilize e-procurement tools and platforms to streamline processes.
- Maintain accurate and up-to-date records of all procurement activities.
- Conduct regular reviews and audits of procurement practices.

4.9.5 **Procurement Roles and Responsibilities**

The following are the roles and responsibilities as it pertains to procurement on this project:

- Project Manager: Overall responsibility for project procurement activities.
- Procurement Team: Responsible for managing the procurement process, including vendor selection, contract negotiation, and supplier performance monitoring.

- Technical Experts: Provide technical expertise and guidance on procurement specifications and vendor selection.
- SLASPA's Finance Department: Responsible for budget management and contract payments.
- SLASPA's Legal Department: Provides legal advice and reviews contracts for compliance.
- Project Stakeholders: Provide input and feedback on procurement decisions.

4.9.6 **Procurement Risk Management**

The following details the risk management process for procurement on this project:

- Identify and assess potential risks associated with procurement activities.
    - Vendor failure
    - Price increases
    - Quality issues
- Develop mitigation strategies to address identified risks.
    - The project manager will develop contingency plans in case a vendor fails to deliver goods or services.
    - The project manager will negotiate fixed prices with vendors to avoid price increases.
    - The project manager will develop quality assurance procedures to ensure that goods and services meet the required quality standards.
- Monitor and track procurement risks throughout the project lifecycle.
- Update risk mitigation strategies as needed.

4.9.7 Procurement Communication

The project manager will communicate procurement activities to stakeholders on a regular basis utilizing the engagement strategies detailed in the stakeholder management plan. This communication will include information about the status of procurements, challenges, achievements, the risks associated with procurements, and any changes to the procurement plan.

4.9.8 Procurement Performance Monitoring

The performance of the procurement management plan will be monitored as follows:

- Establish key performance indicators (KPIs) for procurement activities.
- Track and measure procurement performance against KPIs.
- Conduct regular reviews and identify areas for improvement.
- Continuously improve procurement processes and practices.

The KPIs established to monitor procurement performance on this project:

Chart 23

Procurement KPIs

Category	KPI	Target	Measurement
Cost Efficiency	Procurement cost as percentage of overall project budget	Maintain procurement costs within 5% of the allocated budget.	Track actual procurement costs against the budgeted amount. Regularly analyze cost variances and identify areas for improvement.
Timeliness	Percentage of procurement items delivered on time.	Achieve 95% on-time delivery for critical project	Monitor delivery dates against contracted

		materials and services.	timelines. Conduct root cause analysis for any delays and implement corrective actions.
Quality	Percentage of procurement items meeting quality specifications.	Achieve 98% conformance to quality standards for all procured goods and services.	Implement quality control procedures. Track the number of non-conformance reports and implement corrective actions for suppliers.
Contract Compliance	Percentage of contracts adhered to by both parties.	Achieve 99% compliance with all contractual terms and conditions.	Regularly review contracts and monitor compliance with performance metrics, delivery schedules, and payment terms. Address any deviations promptly.
Supplier Performance	Overall supplier satisfaction and performance rating.	Maintain an average supplier satisfaction rating of 4.5 out of 5.	Conduct regular supplier performance reviews based on cost, quality, timeliness, and communication. Provide feedback to suppliers and work collaboratively to improve performance.

Note: Own work

4.9.9 **Conclusion**

The project manager should:

- Regularly review and update the procurement management plan as needed.
- Conduct lessons learned exercises following project completion.

- Implement best practices and industry standards in procurement activities.
- Share knowledge and experiences across the organization.

4.10 Stakeholder Management Plan

4.10.1 Overview

The purpose of this stakeholder management plan is to identify the project's stakeholders, assess their needs and expectations, and develop a plan for managing their engagement throughout the project. This includes using a power-interest and power-influence matrix to prioritize the key stakeholders and develop a communication and engagement strategy for each group. It aims to ensure effective communication, collaboration, and support from all stakeholders, contributing to project success.

4.10.2 Stakeholder Objectives

The objectives of this stakeholder management plan are as follows:

- To ensure that the air traffic controllers are satisfied with the staffing plan and that it does not compromise safety.
- To ensure that the air traffic control management is satisfied with the staffing plan and that it meets the needs of the air traffic control unit.
- To ensure that the ECCAA is satisfied with the staffing plan and that it complies with Civil Aviation regulations.
- To ensure that the CSA are satisfied with the staffing plan and that it does not violate the Collective Bargaining Agreement.

- To ensure that all stakeholders are engaged in the project and that their needs and expectations are considered. This will help to increase the likelihood of a successful project outcome.

4.10.3 **Stakeholder Identification**

By effectively identifying, analyzing, and engaging stakeholders, the air traffic control staffing optimization project can build a strong foundation for successful implementation and achieve its desired outcomes.

For the purposes of this analysis, primary stakeholders are stakeholders who have a direct intertest in SLASPA and the services that it provides. Secondary stakeholders are the stakeholders who have an indirect interest or benefit in the organization.

Primary Stakeholders:

- Air Traffic Controllers: Directly impacted by the new staffing model, having concerns about job security, workload, and career development.
- Air Traffic Control Management: Responsible for implementing the new model, seeking efficient operations and cost savings.
- Pilots and Airlines: Affected by potential changes in air traffic flow and delays, interested in safety and efficiency.
- Passengers: Interested in convenient and affordable travel, concerned about potential delays and service disruptions.
- ECCAA: Responsible for air traffic safety and regulation, seeking compliance with regulations and optimal system performance.

Secondary Stakeholders:

- Airports: Affected by efficiency and capacity changes, interested in maintaining smooth operations and passenger satisfaction.
- Civil Aviation Training Centers: Responsible for training new personnel, interested in adapting training programs to the new model.
- CSA: Representing air traffic controllers and advocating for their rights and interests.
- Media: Reporting on the project and its impacts, influencing public perception and awareness.
- General Public: Concerned about air travel safety and efficiency, interested in positive project outcomes.

Chart 24

Stakeholder Power-Interest Grid

Stakeholder Group	Power	Interest
Air Traffic Controllers	High	High
Air Traffic Control Management	High	High
Pilots and Airlines	Medium	High
Passengers	Low	Medium
ECCAA	High	High
Airports	Medium	Medium
Civil Aviation Training Center	Low	Medium
CSA	Medium	High
Media	Medium	Medium
General Public	Low	Low

Note: Own work

4.10.4 **Engagement Strategies**

Chart 25

Stakeholder Engagement Strategies

Stakeholder Group	Engagement Strategies
Air Traffic Controllers	• Hold regular meetings and workshops to explain the new staffing model, address concerns, and gather feedback. • Establish a dedicated forum for open communication and dialogue with air traffic controllers. • Develop clear career development pathways within the new model and provide training opportunities. • Address concerns about workload and work-life balance through flexible scheduling and workload management strategies. • Recognize and reward contributions of air traffic controllers to foster positive morale and engagement.
Air Traffic Control Management	• Provide regular updates on project progress and key milestones. • Involve air traffic control management in decision-making processes and model development. • Address concerns about operational efficiency and cost savings through data and performance metrics. • Offer training and support to air traffic control management on implementing the new model. • Build trust and collaboration through open communication and shared goals.
Pilots and Airlines	• Provide clear and timely information about potential changes in air traffic flow and delays. • Establish channels for pilots and airlines to share their feedback and concerns. • Address safety concerns through rigorous testing and validation of the new staffing model. • Collaborate with airlines to develop contingency plans and mitigate potential disruptions. • Partner with pilot associations to ensure smooth implementation and pilot buy-in.
Passengers and General Public	• Communicate potential impacts of the project on travel schedules and delays.

	• Offer clear and accessible information through various channels, including online resources. • Highlight the benefits of the project, such as improved efficiency and safety. • Consider passenger feedback in decision-making processes related to the new model.
ECCAA	• Maintain regular communication and provide detailed progress reports. • Address regulatory concerns and ensure compliance with all governing regulations. • Demonstrate transparency and accountability through data-driven decision-making processes. • Collaborate on data sharing and analysis to ensure accurate and reliable information. • Build trust and relationships through open communication and joint problem-solving.
Airport	• Discuss potential impacts of the project on airport operations and capacity. • Collaborate on developing contingency plans for managing increased traffic flow. • Share data and information related to airport operations and passenger traffic. • Address concerns about noise and environmental impact through mitigation strategies. • Foster a collaborative relationship to ensure seamless integration of the new model into airport operations.
Civil Aviation Training Centers	• Provide information about the new staffing model and training requirements. • Collaborate on developing training programs and curriculum materials. • Offer support and resources to training academies to adapt to the new model. • Share data and insights on air traffic control needs and future trends. • Build a strong partnership to ensure a continuous supply of qualified air traffic control personnel.
CSA	• Maintain open and transparent communication with union representatives. • Address concerns about job security and workforce reductions through transparent communication and clear transition plans.

	• Collaborate on developing policies and agreements regarding the new staffing model. • Involve union representatives in project planning and decision-making processes. • Foster a respectful and collaborative relationship to address concerns and achieve mutually beneficial outcomes.
Media	• Provide regular press releases and media briefings on project progress and key developments. • Respond promptly to media inquiries and address questions transparently. • Organize press tours and demonstrations of the new model. • Partner with media outlets to develop accurate and informative content about the project. • Build trust and relationships with media representatives to ensure positive public perception.

Note: Own work

4.10.5 **Stakeholder Roles and Responsibilities**

Chart 26:

Stakeholder Roles and Responsibilities

Stakeholder Group	Roles and Responsibilities
Project Sponsor	- Approves project charter and scope. - Provides financial resources and executive support. - Champions the project within the organization. - Represents the project to senior management.
Project Manager	- Leads the project team and manages all project activities. - Develops and implements the project plan. - Manages budget and resources. - Communicates project status to stakeholders. - Ensures project deliverables meet quality standards. - Manages risks and issues.
Project Team	- Carries out assigned tasks as per project plan. - Contributes expertise in their respective areas. - Participates in meetings and collaborates with other team members. - Reports progress and issues to the project manager.
Data Analyst	- Identifies and acquires relevant data sources. - Cleans and prepares data for analysis. - Performs exploratory data analysis (EDA) and identifies trends. - Assists with model development and evaluation.

Model Development Team	- Develops and evaluates different staffing optimization models. - Ensures models are accurate and meet project objectives. - Provides technical expertise and guidance.
Change Management Lead	- Develops and implements a change management plan. - Identifies potential resistance to change and develops mitigation strategies. - Manages communications with stakeholders throughout the implementation process. - Conducts training on the new staffing model.
Training Specialist	- Develops and delivers training materials for the new staffing model. - Ensures training programs are effective and meet user needs. - Provides ongoing support to users after training.
Subject Matter Experts (SMEs) – air traffic control	- Provide technical expertise and insights on operations and staffing practices. - Validate data accuracy and model assumptions. - Offer feedback on the new staffing model and its feasibility.
Air Traffic Control Management	- Champion the project within the department. - Communicate the project objectives and benefits to employees. - Provide support and resources for the implementation process. - Address employee concerns and answer questions.
Air traffic controllers	- Participate in training programs on the new staffing model. - Adapt to new work processes and procedures as needed. - Provide feedback on their experience with the new model.
Steering Committee	- Provides strategic guidance and oversight to the project. - Reviews major project decisions and provides direction. - Approves key deliverables and milestones. - Represents various stakeholder interests.
Public	- May require communication on project progress and potential impacts on air traffic. - May need to be informed about project benefits and safety assurances.

Note: Own work

4.10.6 **Conclusion**

The project manager will be responsible for implementing this plan and for ensuring that the stakeholders are satisfied with the project's progress and outcome.

The project manager should regularly review and update the stakeholder management plan to ensure that it is effective and meets the needs of the project.

The project manager should communicate the stakeholder management plan to the project team and stakeholders.

The project manager should monitor the project's stakeholders for any changes in their needs, expectations, or power.

The project manager should adjust the communication and engagement strategy for each stakeholder group as needed.

5 CONCLUSIONS

The project management plan provides a comprehensive roadmap for optimizing staffing at St. Lucia's Air Traffic Control Units. Each knowledge area has been meticulously detailed, ensuring a structured and efficient approach to project execution. Through the rigorous application of project scope, schedule, cost, quality, risk, resource, communications, stakeholder, and procurement management principles, the project aims to achieve enhanced safety and efficiency, increased satisfaction amongst air traffic controllers, cost optimization for SLASPA, enhanced collaboration and communication amongst stakeholders in the industry, and a sustainable implementation model.

1. A project charter is a cornerstone of a project management plan, and its role is beyond simply documenting the launch of a project. It acts as a formal declaration of intent, solidifying the project's existence and purpose within the organization. It not only grants legitimacy to the endeavor but also serves as a crucial step in securing stakeholder buy-in. By clearly outlining the project's objectives, benefits, and potential impact, the charter compels stakeholders to understand its value and invest their support. It invites them to join the conversation, fostering commitment and collaboration from project inception. Through transparent communication and a shared vision, the charter builds consensus and paves the way for a successful, stakeholder-driven project journey.
2. A scope management plan ensures that the project remains focused on its objectives and limits the potential for scope creep. It defines the project boundaries, identifying what is included and what is not. It ensures the

documentation of deliverables, tasks and milestones. It also establishes mechanisms for monitoring and controlling changes to ensure that only elements that are aligned with the project's goals are executed as part of the project.

3. A schedule management plan provides a framework to ensure that the project is developed and executed efficiently, with specific reference to its timeline. It ensures that the project's tasks flow harmoniously towards the project's completion. The schedule management plan ensures that there is a relationship between the project's activities, their dependencies, and their estimated durations. It utilizes a work breakdown structure and identifies the critical path in order to ensure that sequence of activities critical to the project's on-time delivery is known. It sets realistic, achievable milestones, serving as checkpoints for progress and course correction. The schedule management plan, in conjunction with the rest of the project management plan, ensure that resources are when they are needed.
4. A cost management plan serves as the financial backbone of the project. It acts as a blueprint for efficient spending, ensuring we achieve optimal staffing within budgetary constraints. The plan will meticulously estimate all project expenses, from staff salaries and equipment procurement to training and technology upgrades. It also establishes a realistic budget, allocating resources strategically to activities with the highest return on investment. Through meticulous monitoring and tracking, it should identify potential cost overruns early and implement corrective measures like rescheduling or exploring alternative

resources. It is a powerful tool for responsible financial stewardship, safeguarding project success while maximizing the value of every dollar invested in optimizing our vital air traffic control operations.

5. A quality management plan ensures that each deliverable associated with the project is indeed fit for purpose. It defines the benchmarks of success for the project, both in terms of functional capabilities and aesthetic qualities. By establishing clear quality criteria, testing procedures, and corrective action protocols, it instills a culture of continuous improvement. Through rigorous oversight and proactive measures, the plan safeguards against deviations and defects, guaranteeing that every output aligns with the project's envisioned objectives and satisfies the stakeholders' most stringent standards.
6. A resource management plan provides a blueprint for effective staffing and resource allocation within the air traffic control optimization project. The plan coordinates the skillsets and availability of personnel. The resource management plan empowers the project manager to allocate resources efficiently, maximize their utilization, and anticipate and address potential bottlenecks. It also fosters collaboration and transparency by allowing team members to understand their roles and dependencies, facilitating proactive problem-solving and swift adjustments to unforeseen resource constraints.
7. A communication management plan ensures transparent and effective information flow amongst all stakeholders associated with the project. It details the responsibilities, requirements and methods of communication for the project

by establishing a framework for updates, feedback and collaboration. Regular project reports, timely team meetings, and designated communication points for specific roles limit the potential for confusion and fosters trust. The plan strengthens relationships, anticipates potential issues, and empowers stakeholders to be informed participants in the project's success.

8. A risk management plan protects the project’s outcomes from challenges by proactively anticipating potential issues before they become disruptive. The plan identifies risks and assesses them, based on the likelihood of occurrence and the potential impact if they were to occur. The plan further contributes to risk mitigation by developing countermeasures for each risk that is identified.
9. A procurement management plan acts as the project's roadmap for acquiring the necessary goods and services, ensuring a smooth and efficient flow of resources. The plan governs the entire procurement process from identifying needs to selecting vendors, negotiating contracts, and managing deliveries. By establishing clear guidelines and procedures, the procurement management plan prevents costly delays and disruptions. It outlines everything from bid solicitation and evaluation to contract award and performance monitoring, leaving no room for ambiguity or confusion. This proactive approach minimizes risks associated with unreliable vendors, late deliveries, or unexpected price changes.
10. A stakeholder management plan functions within the comprehensive project framework and serves as the vital link between the project team and those

whose interests are impacted by its success. It meticulously identifies and analyzes internal and external stakeholders, such as in this case, from executives and air traffic controllers to airport authorities and local communities. Through tailored communication strategies, the plan ensures regular engagement, keeping stakeholders informed and their concerns addressed. Proactive outreach fosters trust and collaboration, minimizing friction and potential roadblocks. By actively managing expectations and demonstrating the project's value to each stakeholder group, the plan guarantees their continued support and ultimately, contributes to a smooth and successful project lifecycle, securing optimal results for everyone involved.

6 RECOMMENDATIONS

In order to ensure successful implementation of a project designed to optimize staffing at an air traffic control unit or other similar project some specific recommendations must be considered. The first of these is the role of data analysis and forecasting. It is important to engage in continuous data collection and analysis, as well as, scenario planning so as to be better able to forecast future staffing needs and develop contingencies for various scenarios, so as to ensure that human resource can be allocated appropriately based on expected demand.

For an air traffic control unit exploring measure to optimize its staffing, there are several options that can be considered, either in isolation or in combination with each other. These include building human resource capacity through recruitment, training and staff retention, dynamic scheduling, and workload management. These must all be considered in conjunction with the overall fatigue risk management system of the air traffic control unit.

1. The first recommendation is for SLASPA's senior management team. When developing a project charter, SLASPA management should ensure that the scope and objectives of the project are clearly defined. This ensures that all stakeholders have a common understanding of the project's boundaries and desired outcomes. Additionally, it should be ensured that the project charter establishes a governance structure for the project, and defines the roles and responsibilities of stakeholders to ensure effective project oversight.
2. The second recommendation is for SLASPA's management team. In the absence of a project management office, management should ensure facilitate the development and maintenance a comprehensive scope management plan to counteract potential scope

creep. By clearly documenting what is within and outside the project's scope, this plan will ensure that project boundaries remain fixed as initially defined.

3. The third recommendation is for the project manager. The project manager should develop a comprehensive schedule management plan to establish clear guidelines for planning, monitoring, and controlling the project timeline. This plan should include specific procedures for task sequencing, milestone identification, and time estimation, ensuring that all activities align with project objectives and deadlines. Additionally, incorporate a process for regular progress updates and contingency planning to mitigate risks associated with schedule delays
4. The fourth recommendation is for SLASPA's finance team and the project manager. A cost management plan should be developed to establish strict guidelines for budget allocation, tracking, and control. It should include the budget baseline, cost control procedures, and contingency funds and clearly define criteria for their use, enabling flexibility to address unforeseen costs while minimizing impact on the overall budget. This will ensure effective financial control throughout the project lifecycle.
5. The fifth recommendation is for the project manager. The project manager should ensure the development of a quality management plan. This plan should outline specific quality standards for each project deliverable, establish criteria for measuring performance against these standards, and incorporate regular quality audits throughout the project lifecycle. Additionally, the plan should define clear roles and responsibilities for monitoring quality and include protocols for corrective actions if quality standards

are not met. This proactive approach will help maintain project quality and minimize rework and delays.

6. The sixth recommendation is for the project manager. The project manager should develop a robust resource management plan that ensures the efficient identification, acquisition, allocation, and management of resources required for the project's success. This plan should outline the specific human, financial, and material resources required to meet project objectives, ensuring efficient allocation and minimizing resource-related delays. The plan should include strategies for resource acquisition, utilization, and monitoring, as well as contingency plans for resource shortages.
7. The seventh recommendation is for the project manager. The project manager should develop a comprehensive communications management plan to ensure consistent, clear, and timely communication across all project stakeholders. The plan should identify each stakeholder group to identify information needs and communication methods. This will aid the project in fostering transparency, and ensuring effective stakeholder engagement.
8. The eighth recommendation is for SLASPA’s senior management. A comprehensive risk management plan early in the project lifecycle. This plan should include a structured approach for identifying, assessing, and prioritizing potential risks, as well as strategies for mitigation and response. Key risk areas should be identified with input from relevant stakeholders, including operational, financial, and regulatory risks, to ensure the plan aligns with the project objectives and SLASPA’s risk tolerance. Regular

reviews of the risk register should also be scheduled to keep risk mitigation actions updated and responsive to any emerging issues.

9. The ninth recommendation is for SLASPA's finance team. In order to support effective project implementation, the SLASPA finance team should develop a detailed procurement management plan. This plan should outline all procurement requirements, processes, and timelines necessary to meet project milestones. It should include clear procedures for vendor selection, contract management, and monitoring to ensure timely delivery of goods and services. Additionally, the plan should address risk management strategies for procurement-related delays or issues, helping to maintain project schedules and budget integrity.
10. The tenth recommendation is for the project manager. The project manager should ensure the development of a comprehensive stakeholder management plan that identifies all key stakeholders, including their roles, interests, influence levels, and communication needs. This plan should outline strategies for engaging each stakeholder group, with a focus on managing expectations and fostering positive relationships throughout the project lifecycle.

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

Optimizing staffing in an air traffic control unit will have a profound impact on regenerative and sustainable development. It will contribute towards reducing the environmental impact of aviation activities, enhances operational efficiency, improves safety, promotes a healthy work environment, fosters technological advancements, and satisfies communities and stakeholders. By ensuring smooth, safe, and efficient air traffic control operations, the project contributes significantly to both the environmental and economic aspects of sustainable development.

The International Civil Aviation Organization (ICAO) and the United Nations' Sustainable Development Goals (SDGs) are intertwined in the context of projects aimed at optimizing staffing at air traffic control units. ICAO, as the specialized agency of the United Nations, sets global standards and regulations for the aviation industry. Its strategic objectives align with various SDGs, particularly those related to infrastructure development, economic growth, safety, and environmental sustainability.

A project to optimize staffing at an air traffic control unit directly impacts ICAO's strategic objectives by enhancing safety, security, and environmental sustainability. Simultaneously, it aligns with several UN SDGs related to economic growth, innovation, sustainable communities, and climate action. Strategic planning, technological integration, and collaborative partnerships are key to maximizing the project's impact on both ICAO's objectives and the UN's SDGs.

Optimizing staffing at an air traffic control unit and ensuring the sustained operation of the final product can significantly impact both regenerative development and sustainable

development in several ways. The project favors regenerative development and sustainable development through capacity building. Training programs and skill development for staff enhance human capital, supporting both regenerative and sustainable development by empowering the workforce and fostering innovation. It also favors such development through stakeholder engagement. Engaging local communities and stakeholders promotes social inclusivity, supporting regenerative development by ensuring the project aligns with local needs and preferences. It additionally supports the ideals of regenerative and sustainable development through contributing to efficiency and safety. Optimized staffing ensures efficient air traffic control, reducing delays and environmental impact, aligning with regenerative development by minimizing resource use and supporting sustainable development by conserving energy. Finally, the project should see a positive environmental impact. Efficient operations reduce greenhouse gas emissions and noise pollution, supporting regenerative development by mitigating environmental harm and aligning with sustainable development by contributing to climate action.

Notwithstanding, there are aspects of the project that do not favor regenerative and sustainable development. The likely high initial costs can strain resources, potentially hampering other social and environmental development initiatives if funds are diverted from essential programs.

The project's favorable aspects, such as efficient planning, technological integration, adaptability, and optimized operations, significantly favor regenerative and sustainable design. Challenges like initial costs and resistance to change can be mitigated through strategic planning, transparent communication, and collaboration with stakeholders and

local authorities. These efforts are essential for ensuring that the optimization of staffing at an air traffic control unit aligns with regenerative and sustainable principles throughout its lifecycle.

A P5 impact analysis, which assesses the impact of projects in terms of People, Planet, Prosperity, Peace, and Partnership, can further illuminate the project's effects.

People: Improved air traffic control enhances safety for passengers and workers, fostering peace of mind. This relates to SDG 16 - Peace, Justice, and Strong Institutions.

Planet: Reduced emissions and efficient resource use support environmental conservation, contributing to regenerative development. This relates to SDG 15 - Life on Land and sustainable development objectives, and SDG 14 - Life Below Water.

Prosperity: Efficient operations attract airlines and businesses, fostering economic growth and prosperity in the region. This relates to SDG 8 - Decent Work and Economic Growth.

Peace: Enhanced safety and efficient operations contribute to regional stability and peace. This relates to SDG 16 - Peace, Justice, and Strong Institutions.

Partnership: Collaborative efforts involving local communities, aviation authorities, and governments foster partnerships essential for achieving sustainable development goals. This relates to SDG 17 - Partnerships for the Goals.

A detailed, transparent, and inclusive approach to project planning, execution, and continuous operation is crucial for optimizing staffing in an air traffic control unit. Mitigation strategies, such as staff involvement, transparent communication, phased

implementation, and community engagement, can effectively address challenges and ensure the project aligns with regenerative and sustainable principles.

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APPENDICES

7.1 Annex 1: FGP CHARTER

CHARTER OF THE PROPOSED FINAL GRADUATION PROJECT (FGP)

1. Student name

Kendell Peter

2. FGP name

Proposal: Project Management Plan for the Optimization of Staffing for St. Lucia's Air Traffic Control Units

3. Application Area (Sector or activity)

Aviation

4. Student signature

5. Name of the Graduation Seminar facilitator

Roger Valverde Jimenez

6. Signature of the facilitator

7. Date of charter approval

8. Project start and finish date

August 29, 2023	October 16, 2023

9. Research question

Is it possible to develop a project management plan to effectively optimize air traffic control staffing levels and deployment at St. Lucia's Air Traffic Control Units?

10. Research hypothesis

Will a project management plan to optimize air traffic control staffing levels and deployment at St. Lucia's Air Traffic Control Units lead to improvements in operational efficiency within air traffic control operations?

11. General objective

Develop a project management plan for a project to optimize the staffing of St. Lucia's Air Traffic Control Units

12. Specific objectives

Specific objectives

1. To develop a project charter to formally document the project's initiation.
2. To develop an integration management plan to coordinate all aspects of the project.
3. To develop a scope management plan to ensure that the scope is well defined, controlled and aligned with the objectives of the project.
4. To develop a schedule management plan to establish a framework to guide the development, management and controlling of the project schedule.
5. To develop a cost management plan to establish a framework to plan, estimate, budget, control and monitor costs related to the project.
6. To develop a quality management plan to ensure that the deliverables of the project meet the required quality standards and objectives.

7. To develop a resource management plan to establish a framework for identifying, acquiring, allocating and managing the resources required for the project.
8. To develop a communication management plan to establish a framework to plan, execute, monitor and control project communications.
9. To develop a risk management plan to establish a framework to identify, assess, mitigate and manage risks within the project.
10. To develop a procurement management plan to establish a framework for planning, executing and controlling all procurement-related activity within the project.
11. To develop a stakeholder management plan to establish a framework for identifying, analyzing, engaging, and managing stakeholders throughout the project.

13. FGP purpose or justification

A project management plan ensures that the project's objectives, scope, and deliverables are well defined. In the context of staff optimization, this plan would specify what aspects of ATC operations need improvement and how staff optimization will be achieved. This clarity prevents scope creep and ensures everyone understands the project's purpose.

ATC operations involve inherent risks, and any changes to staff optimization could impact safety and efficiency. A project management plan includes risk assessment and mitigation strategies, helping the team anticipate and address potential challenges proactively.

Air traffic control demands high levels of precision and reliability. A project management plan includes quality control measures to ensure that staff optimization changes meet stringent standards for safety and efficiency.

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

1. FGP
    1.1 FGP Deliverables
        1.1.1 FGP Charter
        1.1.2 Preliminary bibliographical research
        1.1.3 Corrections
        1.1.4 Theoretical Framework
        1.1.5 Methodological Framework
        1.1.6 Introduction
        1.1.7 Project Validation
        1.1.8 Executive Summary
        1.1.9 Abstract
        1.1.10 Indexes
    1.2 Graduation Approval Seminar
2. Tutor
    2.1 Tutor
        2.1.1 Tutor Assignment
        2.1.2 Communication
    2.2 Adjustment of previous chapters
    2.3 Chapter IV Development
        2.3.1 Integration Management Plan
        2.3.2 Scope Management Plan
        2.3.3 Schedule Management Plan
        2.3.4 Cost Management Plan
        2.3.5 Quality Management Plan
        2.3.6 Resource Management Plan
        2.3.7 Communications Management Plan
        2.3.8 Risk Management Plan
        2.3.9 Procurement Management Plan
        2.3.10 Stakeholder Management Plan
    2.4 Conclusions
    2.5 Recommendations
3. Reading by Reviewers
    3.1 Reviewers Assignment Request
        3.1.1 Assignment of two reviewers
        3.1.2 Communication
        3.1.3 FGP submission to reviewers
    3.2 Reviewers work
        3.2.1 Reviewer 1
            3.2.1.1 FGP Reading
            3.2.1.2 Reader 1 report
        3.2.2 Reviewer 2
            3.2.2.1 FGP Reading
            3.2.2.2 Reader 2 report
4. Adjustments
    4.1 Report for reviewers
    4.2 FGP Update
    4.3 Second review by reviewers
5. Presentation to Board of Examiners
    5.1 Final review by board
    5.2 FGP Grade report

15. FGP budget

Detail the budged that you estimate is necessary to develop your FGP document (relevant costs).

Software:	$150 USD
Printing FGP	$200 USD
Shipping Costs	$200 USD
Total	$550 USD

16. FGP planning and development assumptions

- The project scope is stable and there are no major changes expected to the project management plan.
- The project management plan will adhere to the allocated budget.
- Information about the project is readily available.
- There will be no limitation to the use of information on the project.

17. FGP constraints

2. The FGP must be finalized within 12 weeks.
3. The quality of the FGP may depend on changing regulatory requirements.

4. The presence of known risks and uncertainties may limit the project's ability to achieve certain objectives or outcomes.
5. Limited availability of skilled personnel, equipment, or materials can impact the project's capacity to execute certain tasks.

18. FGP development risks

- A strong hurricane season may delay the work tours and the data collection in the field, which may in turn, delay the deliverables development.
- Lock-down due to the resurgence of COVID-19 or another pandemic may restrict access to data collection.
- Illness of the researcher may affect completion of the task.

19. FGP main milestones

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

Deliverable	**Finish estimated date**
1.1 FGP profile	
1.1.1 FGP Charter	
1.1.2 Preliminary bibliographical research	September 4, 2023
1.1.3 Corrections	September 18, 2023
1.1.4 Theoretical Framework	September 25, 2023
1.1.5 Methodological Framework	October 2, 2023
1.1.6 Introduction	October 9, 2023
1.1.7 Project Validation	October 9, 2023
1.1.8 Executive Summary	October 16, 2023
1.1.9 Abstract	October 16, 2023

1.1.10 Indexes	October 16, 2023
1.2 Graduation Approval Seminar	October 23, 2023
2.1 Tutor	
2.1.1 Tutor Assignment	October 24, 202
2.1.2 Communication	October 26, 2023
2.2 Adjustment of previous chapters	November 2, 2023
2.3 Chapter IV Development	
2.3.1 Integration Management Plan	January 16, 2024
2.3.2 Scope Management Plan	January 16, 2024
2.3.3 Schedule Management Plan	January 16, 2024
2.3.4 Cost Management Plan	January 16, 2024
2.3.5 Quality Management Plan	January 16, 2024
2.3.6 Resource Management Plan	January 16, 2024
2.3.7 Communications Management Plan	January 16, 2024
2.3.8 Risk Management Plan	January 16, 2024
2.3.9 Procurement Management Plan	January 16, 2024
2.3.10 Stakeholder Management Plan	January 16, 2024
2.4 Conclusions	January 23, 2024
2.5 Recommendations	January 30, 2024
3.1 Reviewers Assignment Request	February 6, 2024
3.1.1 Assignment of two reviewers	February 1 2024
3.1.2 Communication	February 5, 2024
3.1.3 FGP submission to reviewers	February 6, 2024
3.2.1 Reviewer 1	
3.2.1.1 FGP Reading	February 19, 2024
3.2.1.2 Reader 1 report	February 24, 2024
3.2.2 Reviewer 2	
3.2.2.1 FGP Reading	February 19, 2024
3.2.2.2 Reader 2 report	February 24, 2024

20. Theroretical framework

20.1 Estate of the “matter”

Background description and current status of the problem and research done about it. The current state of the problem or situation being studied is commented. How has it been resolved until now?, which improvements have been proposed?, what has been the result of its implementation?, have there been another research works done about it? What were the results of those research works?. Mention any other factors that help to better understand the problem and its current status.

Example: Considering the clinics example which has been using along this document: Description of what a clinic is, what is its function and benefits and functional features. Factors such as current status of the implementation of sustainable design and construction in clinics and what standards are being used for those purposes.

In order to complete this section several research activities can be used: bibliographical (reports, thesis, books or magazines, interviews to experts of clinic functionaries, field observation, etc.

The problem of a shortage of air traffic controllers is a critical issue within the aviation industry that can have far-reaching consequences. This problem arises when there are not enough qualified air traffic controllers to meet the demands of managing air traffic in a given airspace or at a particular airport (FAA, 2020).

To address the problem of a shortage of air traffic controllers, aviation authorities and air traffic control organizations need to implement strategies such as recruiting and training new controllers, offering competitive compensation packages, improving working conditions, and investing in advanced technology to augment controller capabilities. Long-term planning and succession management are also essential to prevent future shortages (FAA, 2020).

20.2 Basic conceptual framework

List of the basic concepts to be included in the document.

Examples: project management, LEED certification, clinics, sustainable design and construction, etc.

Project Management
Resource Management
Human Factors
Staffing Models
Regulatory Compliance
Workforce Planning
Safety Culture
Change Management

21. Methodological framework

Objective	Name of deliverable	Information sources	Research method	Tools	Restrictions
1. To develop a project charter to	Project Charter	Primary: Communication with stakeholder	Qualitative. Written information analysis.	Bibliographical files Questionaries	Few books on the subject. Difficult to

formally document the project's initiation.		s, brainstormin g sessions Secondary: Organizatio nal policies and procedures, PMBOK		Semi-structured interviews .	define the population and thus the sample. Limited time of the personnel.
2. To develop an integration manageme nt plan to coordinate all aspects of the project.	Integration Management Plan	Primary: Project charter, meetings with stakeholder s Secondary: PMBOK, Industry reports	Qualitative, Analytical	Literature review, Stakeholder interviews,	List of stakeholder s is limited, literature on the subject may not be applicable to this environmen t
3. To develop a scope manageme nt plan to ensure that the scope is well defined, controlled and aligned with the objectives of the project.	Scope Management Plan	Primary: Personnel records, workload analysis Secondary: Regulatory documents, academic journals	Qualitative, Analytical	Expert judgement	Finding experts in this field may be difficult in this part of the world
4. To develop a schedule manageme nt plan to establish a framework to guide the developmen t,	Schedule Management Plan	Primary: Personnel records, workload analysis Secondary: Industry standards and guidelines,	Analytical	Data analysis	A lot of assumption s need to be made to develop the schedule managemen t plan

management and controlling of the project schedule.		shift management templates			
5. To develop a cost management plan to establish a framework to plan, estimate, budget, control and monitor costs related to the project.	Cost Management Plan	Primary: Personnel records Secondary: Cost estimation tools	Analytical	Expert judgement, data analysis	Costs of certain resources may change during the project's execution
6. To develop a quality management plan to ensure that the deliverables of the project meet the required quality standards and objectives.	Quality Management Plan	Primary: Personnel and performance records Secondary: Academic research	Qualitative	Decision making	Considering that quality is an indication of fitness for purpose, it may mean different things in different jurisdictions
7. To develop a resource management plan to establish a framework for identifying,	Resource Management Plan	Primary: Personnel records, workload analysis Secondary: Industry reports	Analytical, qualitative	Decision making	There may be competition from resources as SLASPA in engaged in multiple activities

acquiring, allocating and managing the resources required for the project.					
8. To develop a communication management plan to establish a framework to plan, execute, monitor and control project communications.	Communication Management Plan	Primary: Internal meetings Secondary: PMBOK, lessons learned from similar projects	Analytical	Expert judgement	It may be difficult to fully communicate technical matters to non-technical people
9. To develop a risk management plan to establish a framework to identify, assess, mitigate and manage risks within the project.	Risk Management Plan	Primary: Meetings with project stakeholders Secondary: Industry guidelines, case studies	Analytical	Decision making	Some risk that have to be accepted may not be palatable to the hierarchy of the organization
10. To develop a procurement management plan to establish a framework for planning,	Procurement Management Plan	Primary: Meetings with stakeholders Secondary: Regulatory guidelines	Analytical	Expert judgement	Concessions may need to be made

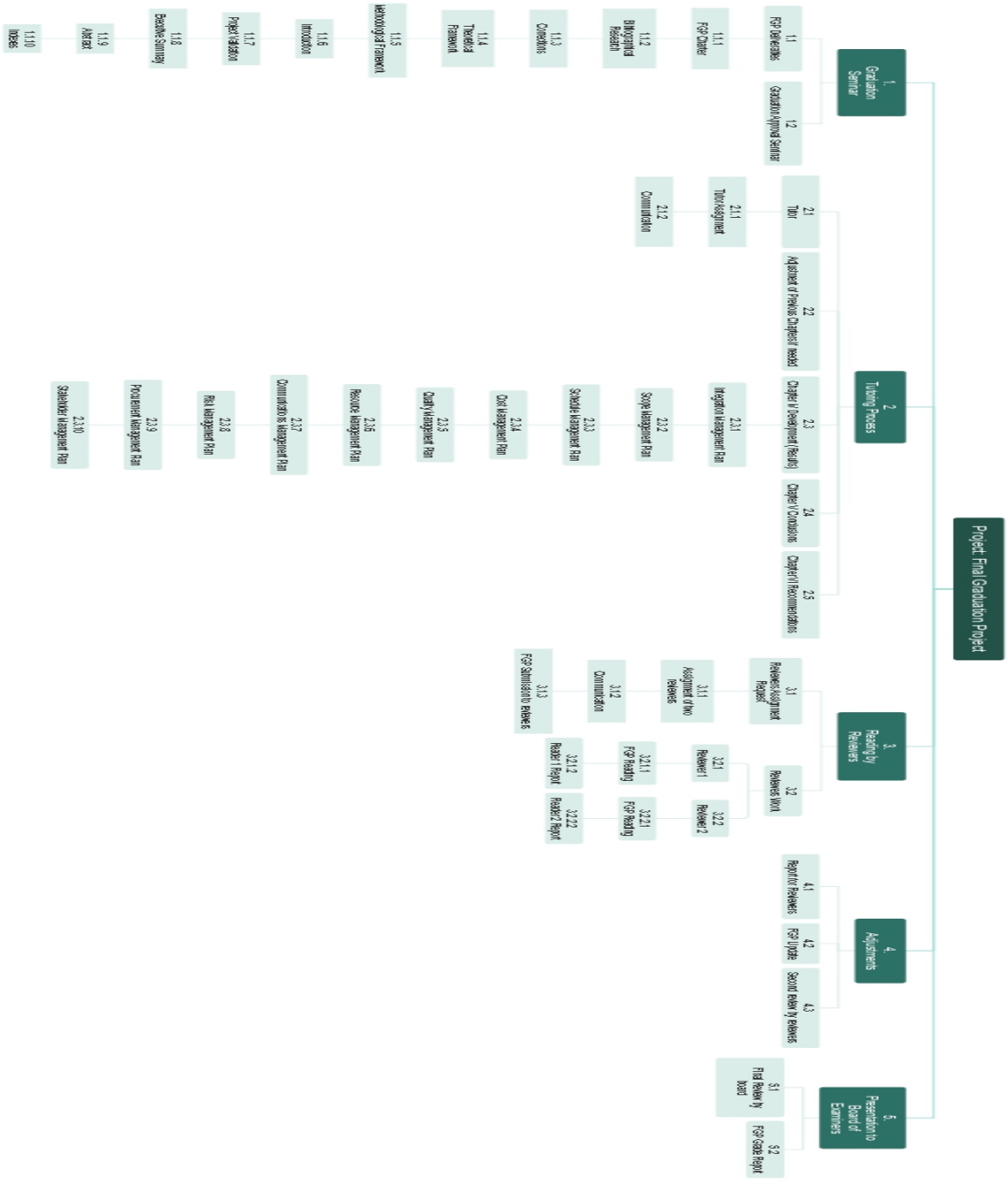
executing and controlling all procurement-related activity within the project.					
11. To develop a stakeholder management plan to establish a framework for identifying, analyzing, engaging, and managing stakeholders throughout the project.	Stakeholder Management Plan	Primary: Meeting with stakeholders Secondary: Feedback surveys	Qualitative	Decision making	Some of the stakeholders who need their requirement met may have a disproportionate amount of power and influence

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

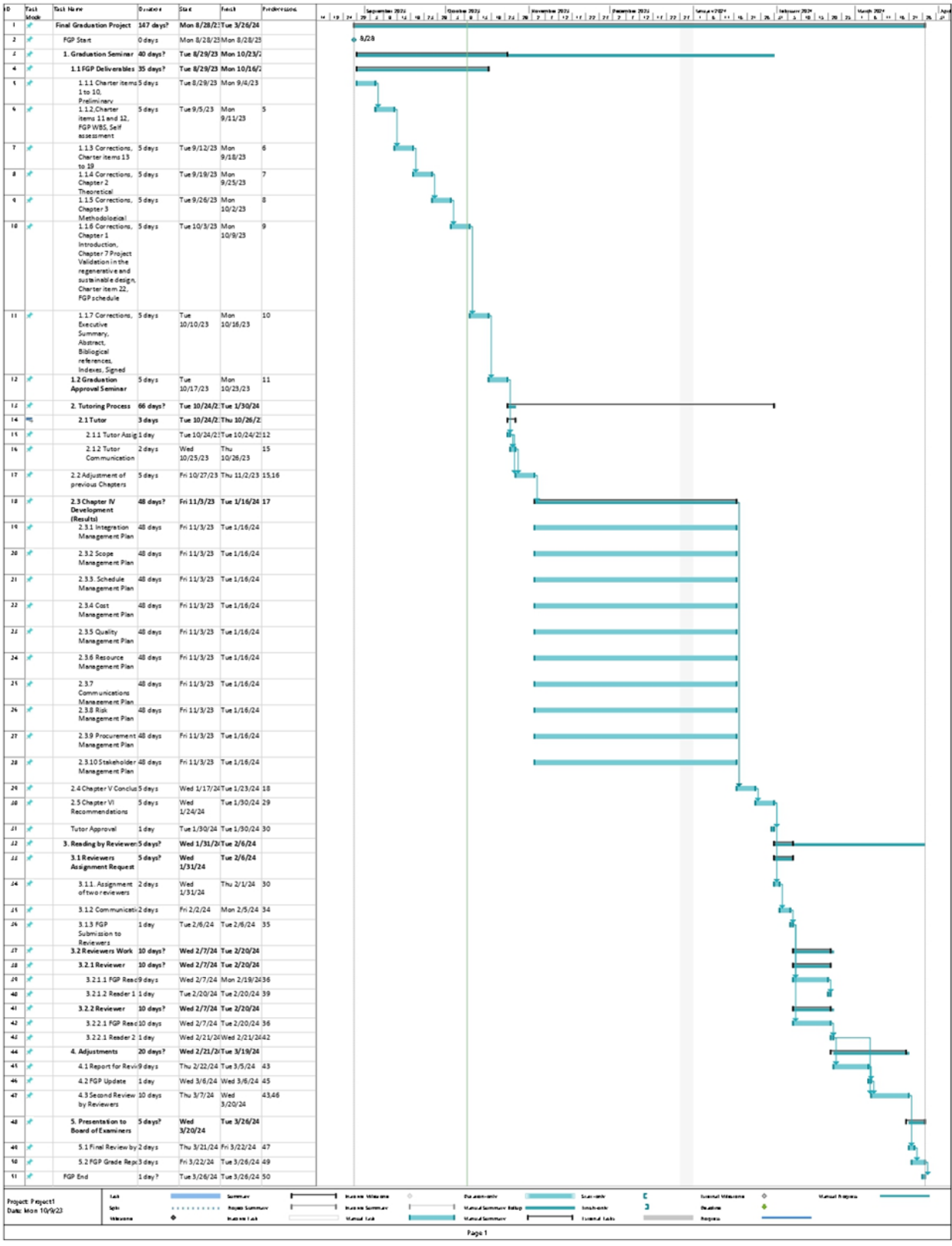
The FGP complies with the concepts of regenerative and sustainable development by incorporating principles that prioritize environmental stewardship, social well-being, economic resilience, and continuous improvement. This ensures that projects not only achieve their objectives efficiently but also contribute positively to the environment, society, and the economy, aligning with the concepts of regenerative and sustainable development. Such an approach ensures that projects leave a lasting positive impact, fostering a sustainable legacy for future generations. A project to optimize staffing at an air traffic control unit can align with regenerative principles in several ways, promoting not only efficiency but also sustainability and positive social impact. By designing the project with a focus on efficiency, social well-being, environmental sustainability, economic resilience, community engagement, and continuous improvement, it embodies regenerative principles. By considering the holistic impact of staffing optimization, the project can contribute not only to the efficiency of air traffic operations but also to the

well-being of employees, the community, and the environment, aligning with the broader goals of regenerative practices. Some of the ways to measure environmental stewardship is to observe whether green practices are implemented or whether there are efforts to reduce the carbon footprint of the project.

Appendix 2: FGP WBS



Appendix 3: FGP Schedule



ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		**Final Graduation Project**	**147 days?**	**Mon 8/28/23**	**Tue 3/26/24**	
2		FGP Start	0 days	Mon 8/28/23	Mon 8/28/23	
3		**1. Graduation Seminar**	**40 days?**	**Tue 8/29/23**	**Mon 10/23/2**	
4		**1.1 FGP Deliverables**	**35 days?**	**Tue 8/29/23**	**Mon 10/16/2**	
5		1.1.1 Charter items 1 to 10, Preliminary	5 days	Tue 8/29/23	Mon 9/4/23	
6		1.1.2.Charter items 11 and 12, FGP WBS, Self assessment	5 days	Tue 9/5/23	Mon 9/11/23	5
7		1.1.3 Corrections, Charter items 13 to 19	5 days	Tue 9/12/23	Mon 9/18/23	6
8		1.1.4 Corrections, Chapter 2 Theoretical	5 days	Tue 9/19/23	Mon 9/25/23	7
9		1.1.5 Corrections, Chapter 3 Methodological	5 days	Tue 9/26/23	Mon 10/2/23	8
10		1.1.6 Corrections, Chapter 1 Introduction, Chapter 7 Project Validation in the regenerative and sustainable design, Charter item 22, FGP schedule	5 days	Tue 10/3/23	Mon 10/9/23	9
11		1.1.7 Corrections, Executive Summary, Abstract, Bibliogical references, Indexes, Signed	5 days	Tue 10/10/23	Mon 10/16/23	10
12		**1.2 Graduation Approval Seminar**	5 days	Tue 10/17/23	Mon 10/23/23	11
13		**2. Tutoring Process**	**66 days?**	**Tue 10/24/2**	**Tue 1/30/24**	
14		**2.1 Tutor**	**3 days**	**Tue 10/24/2**	**Thu 10/26/2**	
15		2.1.1 Tutor Assig	1 day	Tue 10/24/2	Tue 10/24/2	12
16		2.1.2 Tutor Communication	2 days	Wed 10/25/23	Thu 10/26/23	15
17		2.2 Adjustment of previous Chapters	5 days	Fri 10/27/23	Thu 11/2/23	15,16
18		**2.3 Chapter IV Development (Results)**	**48 days?**	**Fri 11/3/23**	**Tue 1/16/24**	17
19		2.3.1 Integration Management Plan	48 days	Fri 11/3/23	Tue 1/16/24	
20		2.3.2 Scope Management Plan	48 days	Fri 11/3/23	Tue 1/16/24	
21		2.3.3. Schedule Management Plan	48 days	Fri 11/3/23	Tue 1/16/24	
22		2.3.4 Cost Management Plan	48 days	Fri 11/3/23	Tue 1/16/24	
23		2.3.5 Quality Management Plan	48 days	Fri 11/3/23	Tue 1/16/24	
24		2.3.6 Resource Management Plan	48 days	Fri 11/3/23	Tue 1/16/24	
25		2.3.7 Communications Management Plan	48 days	Fri 11/3/23	Tue 1/16/24	
26		2.3.8 Risk Management Plan	48 days	Fri 11/3/23	Tue 1/16/24	
27		2.3.9 Procurement Management Plan	48 days	Fri 11/3/23	Tue 1/16/24	
28		2.3.10 Stakeholder Management Plan	48 days	Fri 11/3/23	Tue 1/16/24	
29		2.4 Chapter V Conclus	5 days	Wed 1/17/24	Tue 1/23/24	18
30		2.5 Chapter VI Recommendations	5 days	Wed 1/24/24	Tue 1/30/24	29
31		Tutor Approval	1 day	Tue 1/30/24	Tue 1/30/24	30
32		**3. Reading by Reviewers**	**5 days?**	**Wed 1/31/2**	**Tue 2/6/24**	
33		**3.1 Reviewers Assignment Request**	**5 days?**	**Wed 1/31/24**	**Tue 2/6/24**	
34		3.1.1. Assignment of two reviewers	2 days	Wed 1/31/24	Thu 2/1/24	30
35		3.1.2 Communicati	2 days	Fri 2/2/24	Mon 2/5/24	34
36		3.1.3 FGP Submission to Reviewers	1 day	Tue 2/6/24	Tue 2/6/24	35
37		**3.2 Reviewers Work**	**10 days?**	**Wed 2/7/24**	**Tue 2/20/24**	
38		**3.2.1 Reviewer**	**10 days?**	**Wed 2/7/24**	**Tue 2/20/24**	
39		3.2.1.1 FGP Read	9 days	Wed 2/7/24	Mon 2/19/24	36
40		3.2.1.2 Reader 1	1 day	Tue 2/20/24	Tue 2/20/24	39
41		**3.2.2 Reviewer**	**10 days?**	**Wed 2/7/24**	**Tue 2/20/24**	
42		3.2.2.1 FGP Read	10 days	Wed 2/7/24	Tue 2/20/24	36
43		3.2.2.1 Reader 2	1 day	Wed 2/21/24	Wed 2/21/24	42
44		**4. Adjustments**	**20 days?**	**Wed 2/21/2**	**Tue 3/19/24**	
45		4.1 Report for Revi	9 days	Thu 2/22/24	Tue 3/5/24	43
46		4.2 FGP Update	1 day	Wed 3/6/24	Wed 3/6/24	45
47		4.3 Second Review by Reviewers	10 days	Thu 3/7/24	Wed 3/20/24	43,46
48		**5. Presentation to Board of Examiners**	**5 days?**	**Wed 3/20/24**	**Tue 3/26/24**	
49		5.1 Final Review by	2 days	Thu 3/21/24	Fri 3/22/24	47
50		5.2 FGP Grade Repo	3 days	Fri 3/22/24	Tue 3/26/24	49
51		FGP End	1 day?	Tue 3/26/24	Tue 3/26/24	50

Must be directly related to the WBS and its work packages. Must include activities, duration, start date, finish date and resources.

- Must be created in MS Project or similar approved software.

Appendix 4: Preliminary bibliographical research

Alex, M., (2018, May 1). Why planning is the most critical step in project management. TechRepublic. https://www.techrepublic.com/article/why-planning-is-the-most-critical-step-inproject-management/#:~:text=Project%20planning%20plays%20an%20essential

- This article discusses the importance of planning in project management. As a result, it is justified for this to be used as a resource. It is informative as it guides one of the first steps in developing a project management plan. It reinforces the foundational principles of project management, adds depth to the discussion, and demonstrates a commitment to evidence-based practices in the field.

American Psychological Association. (2019). Publication manual of the American Psychological Association -Seventh Edition. Washington, DC: American Psychological Association.

- The APA guide in the bibliography is justified as it ensures compliance with academic citation standards, promotes ethical writing practices, enhances the paper's professionalism, and serves as a valuable resource for both current and future academic endeavors. It demonstrates a commitment to rigorous academic writing and citation accuracy.

Chervoni-Knapp, T. (2022, June). The Staffing Shortage Pandemic. Pub Med Central. https://doi.org/10.1016%2Fj.jradnu.2022.02.007

- This article addresses a similar problem in a different industry. It is justified to be included in the bibliography because it broadens the paper's perspective, promotes innovation, allows for benchmarking, and demonstrates a comprehensive and interdisciplinary research approach. It enriches the paper's content by drawing on a wider range of insights and solutions, ultimately contributing to a more robust and informed project management plan.

EuroControl (2022, December 19). ATC Mobility and Capacity Shortfalls. EuroControl Think Paper Series. https://www.eurocontrol.int/sites/default/files/2022-12/eurocontro-think-paper-19-atc-mobility-capacity.pdf

- This resource addresses the same problem within the same industry but in a different jurisdiction. It is justified because it enables comparative analysis, supports jurisdictional adaptation, offers a global perspective, provides insights into local regulations and risks, and contributes to a comprehensive understanding of the requirements of the applicable project management practices. It enriches the paper's content by drawing on a wider range of experiences and contexts, ultimately enhancing the development of a well-informed project management plan tailored to this jurisdiction.

FAA (2020). The Air Traffic Controller Workforce Plan 2021/2030. U.S. Department of Transportation. https://www.faa.gov/air_traffic/publications/controller_staffing/media/2021-AFN_010-CWP2021.pdf

- This resource addresses the same problem within the same industry but in a different jurisdiction and outlines their plans to address the issue. It enriches the paper's content by providing valuable insights, transferable strategies, and a broader perspective on addressing common industry challenges. Ultimately, it contributes to the development of a more robust and informed project management plan tailored to the local context.

Johnson, S. R. (2022, July 28). Staff Shortages Choking U.S. Health Care System. US News and World Report. https://www.usnews.com/news/health-news/articles/2022-07-28/staff-shortages-choking-u-s-health-care-system

- This article addresses a similar problem in a different industry. It is justified to be included in the bibliography because it broadens the paper's perspective, promotes innovation, allows for benchmarking, and demonstrates a comprehensive and interdisciplinary research approach. It enriches the paper's content by drawing on a wider range of insights and solutions, ultimately contributing to a more robust and informed project management plan

Project Management Institute. (2017). A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) - Sixth Edition, Project Management Institute, Inc., 2017.

- Including the PMBOK is justified because it provides comprehensive knowledge, a theoretical framework, standardized terminology, best practices, references, foundational knowledge transfer, practical application, and historical and theoretical context. These benefits contribute to a well-informed, well-structured, resource provides guidance for project management.

Project Management Institute. (2021). A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) - Seventh Edition, Project Management Institute, Inc., 2021.

- Including the PMBOK is justified because it provides comprehensive knowledge, a theoretical framework, standardized terminology, best practices, references, foundational knowledge transfer, practical application, and historical and theoretical context. These benefits contribute to a well-informed, well-structured, resource provides guidance for project management.

Shepardson, D. (2023, June 23). Critical US air traffic controller facilities face serious staffing shortages, audit says. Reuters. https://www.reuters.com/business/aerospace-defense/critical-us-air-traffic-controller-facilities-face-staffing-shortages-audit-2023-06-23/

- This article addresses a related problem in the same industry but in a different jurisdiction. It is included because it provides industry-specific insights, facilitates comparative analysis, supports best practice transferability, informs risk assessment, addresses legal and regulatory considerations, offers cultural and ethical insights, provides a global perspective, and demonstrates comprehensive research. These benefits contribute to the development of a well-informed and contextually relevant project management plan.

Smith, L. (2023, July 10). Travel at Risk: Air Traffic Control Warns of Strikes Amidst Staffing Crisis. Business Traveler. https://businesstravelerusa.com/news/air-traffic-control-strike-threats-europe-summer/

- This article addresses a related problem in the same industry but in a different jurisdiction. It is included because it provides industry-specific insights, facilitates comparative analysis, supports best practice transferability, informs risk assessment, addresses legal and regulatory considerations, offers cultural and ethical insights, provides a global perspective, and demonstrates comprehensive research. These benefits contribute to the development of a well-informed and contextually relevant project management plan.

Wolfsteller, P. (2023, June 27). FAA’s air traffic controller shortage poses safety risk: government report. FlightGlobal. https://www.flightglobal.com/safety/faas-air-traffic-controller-shortage-poses-safety-risk-government-report/153943.article

- This resource addresses the same problem within the same industry but in a different jurisdiction. It is justified because it enables comparative analysis, supports jurisdictional adaptation, offers a global perspective, provides insights into local regulations and risks, and contributes to a comprehensive understanding of the requirements of the applicable project management practices. It enriches the paper's content by drawing on a wider range of experiences and contexts, ultimately enhancing the development of a well-informed project management plan tailored to this jurisdiction.

Appendix 5: Other relevant information

Appendix 6: Philologist Letter

Vieux Fort Comprehensive Secondary School

Vieux Fort ♦ St. Lucia ♦ West Indies
Telephone : (758)454-6350/454-5310 Fax : (758)454-3739
Email: agustave@vfcss.edu.lc

Universidad Para La Cooperación Internacional
Avenida 15, Calle 35
Barro Escalante, San Jose 10101
Costa Rica.

To whom it may concern

Re: Philological Review of Kendell Peter's Final Graduation Project

I have read and reviewed the Final Graduation Project entitled "PROJECT MANAGEMENT PLAN FOR THE OPTIMIZATION OF STAFFING FOR ST. LUCIA'S AIR TRAFFIC CONTROL UNITS" prepared by Kendell Peter as part of requirements for the master's in Project Management (MPM) Degree at UCI.

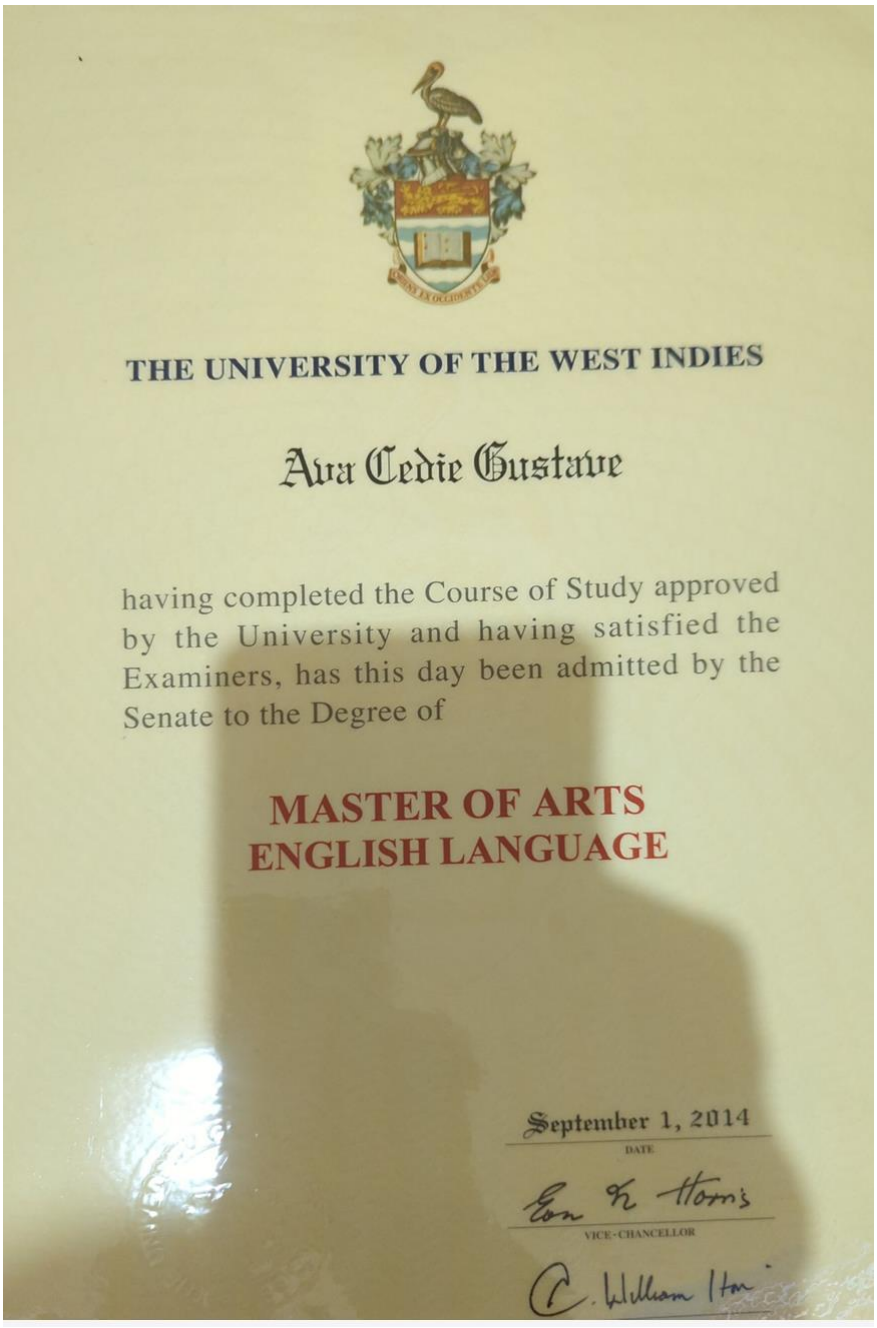
I have examined the document's academic writing standards and English usage. I find the language employed to be clear and concise, demonstrating a sophisticated and precise syntax throughout. The spelling is accurate, and the register is appropriate for the level of work presented. Overall, the fluency of the writing is proficient, precise, and mature. The scholarly apparatus utilized is accurate, consistent and well-judged. The document appears complete and organized in a logical manner.

Regards,

A. Gustave

Ava C. Gustave
MA English

Appendix 9: Philologist Qualification



THE UNIVERSITY OF THE WEST INDIES

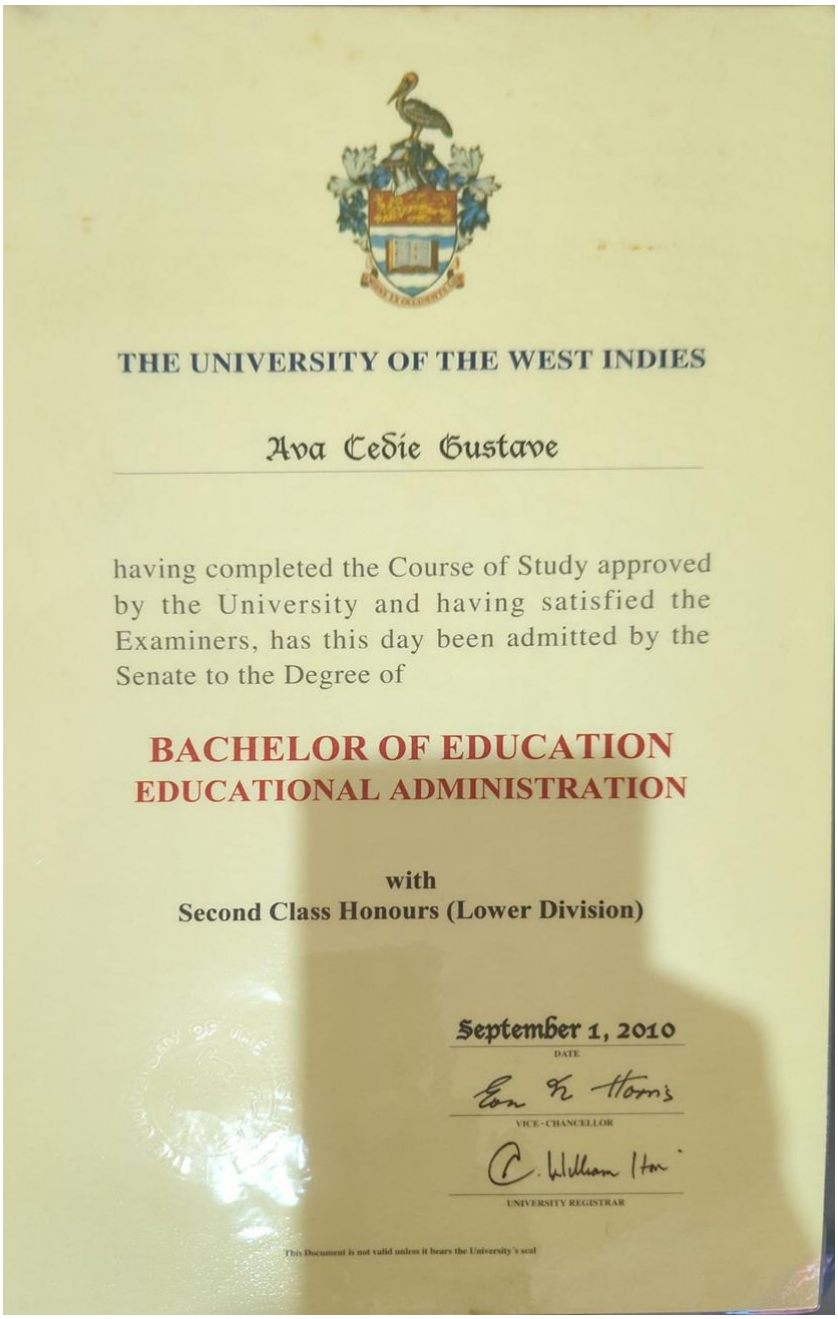
Ava Cedie Gustave

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

MASTER OF ARTS
ENGLISH LANGUAGE

September 1, 2014
DATE

VICE-CHANCELLOR



THE UNIVERSITY OF THE WEST INDIES

Ava Cedie Gustave

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

BACHELOR OF EDUCATION
EDUCATIONAL ADMINISTRATION

with
Second Class Honours (Lower Division)

September 1, 2010
DATE

VICE-CHANCELLOR

UNIVERSITY REGISTRAR

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