UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL
(UCI)

PROJECT MANAGEMENT PLAN FOR THE UPGRADE OF EXISTING TECHNOLOGICAL INFRASTRUCTURE, RESOURCES AND THE PROVISION OF TECHNOLOGICAL SUPPORT TRAINING FOR THE STAFF AND STUDENTS OF THE CICERON SECONDARY SCHOOL IN SAINT LUCIA

YASMIN ARLET TYSON

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

Castries, Saint Lucia
February 2023

UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL

(UCI)

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

_____

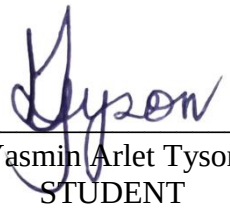
Luis Diego Argüello Araya
TUTOR

_____

Fabio Muñoz Jiménez
REVIEWER No.1

_____

Carlos Castro Torres
REVIEWER No.2



_____

Yasmin Arlet Tyson
STUDENT

DEDICATION

This research project is dedicated to my circle. A true group of friends who journeyed with me through every phase of the research exercise. Excellence was not an option, as they encouraged me to be more resilient and persevere to the end.

"Do the best you can until you know better. Then when you know better, do better." – *Maya Angelou*

ACKNOWLEDGMENTS

I would first like to thank the Almighty God for granting me the health and strength to undertake this journey of higher education. My thesis advisor, Professor Luis Diego Argüello Araya, for his continuous encouragement and pointed feedback on my work and for always checking in on me when things appeared quiet. I am gratefully indebted to him for his very valuable comments on this thesis.

I would also like to acknowledge the Principal of the Ciceron Secondary School for his cooperation and support in the development of the project background. His reports provided the necessary insight to lay the foundation of this thesis.

Finally, I would like to express my very profound gratitude to my family and friends for their unwavering support and continuous encouragement throughout my years of study. They also helped me through the thesis research and writing processes. This accomplishment would not have been possible without them. Thank you.

ABSTRACT

The project management plan (PMP) is usually referred to as the 'bible of the project'. The objective of this document is to develop a Project Management Plan for the Ciceron Secondary School in accordance with the standards set forth by the Project Management Institute, to strategically upgrade the existing technological infrastructure, resources, wireless connectivity, technologies, and support related training of staff and students. This document encapsulates a summary of all the essential requirements, methods and procedures needed to deliver the benefits of the project.

By implementing this PMP, a more structured and systematic approach, to improving the student performance, teacher morale and student attendance by 30%, becomes a reality.

With the ever-changing world of technology, the coronavirus (COVID-19) pandemic continues to show the world that different modalities of teaching and learning need to be explored and reinforced by educators. The ten knowledge areas of the PMP, which are integration, scope, schedule, cost, quality, resources, communications, risks, procurement, and stakeholders, provide an avenue for the effective implementation of the project management processes of initiating, planning, executing, monitoring and controlling, and closing. The management plans are developed using both primary and secondary sources of information along with analytical-synthetic, statistical, observation, inductive and deductive methods of research. The various methods of data collection and analysis allow for the researchers to prove or refute hypotheses based on clearly defined parameters, environments and assumptions. Due to this, it enables one to confidently contribute to knowledge as research can be verified and replicated.

The benefits emanating from the PMP includes project success, sustainability for stakeholders and a systematic approach for the coordination of processes and activities. Further benefits are realized in an improvement in student and teacher access to technological tools and resources, and the redefined teaching-learning environment which inadvertently signal a boost in morale, attendance and performance.

INDEX OF CONTENTS

INDEX OF FIGURES

INDEX OF CHARTS

ABBREVIATIONS AND ACRONYMS

AC	Actual Cost
AT	Administrative Team
CA	Control Accounts
CAPMF	California Project Management Framework
CBA	Cost Benefit Analysis
CCB	Change Control Board
CEE	Common Entrance Examination
CICSS	Ciceron Secondary School
CoQ	Cost of Quality
COVID-19	Coronavirus disease 2019
CPEA	Caribbean Primary Exit Assessment
CPI	Cost Performance Index
CSEC	Caribbean Secondary Education Certificate
CXC	Caribbean Examination Council
EOL	End of life
EOSL	End of Service Life
ETC	Estimate to Complete
EV	Earned Value
EVM	Earned Value Management
FF	Finish-to-Finish
FGP	Final Graduation Project
FS	Finish-to-Start
HOD	Head of Department
ICT	Information and Communication Technology
IFB	Invitation for Bid
IT	Information Technology
KPIs	Key Performance Indicators
LUCELEC	Saint Lucia Electricity Services Limited
MOE	Ministry of Education, Sustainable Development, Innovation, Science, Technical and Vocational Training

MPM	Master's in Project Management
MT	Management Team
NTRC	National Telecommunications Regulatory Commission
OECD	Organisation for Economic Co-operation and Development
PERT	Program Evaluation Review Technique
PM	Project Manager
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
PMP	Project Management Plan
PO	Purchase Order
PO	Project Owner
PQA	Project Quality Assurance
PT	Project Team
PTL	Project Team Leader
PV	Planned Value
QA	Quality Assurance
QC	Quality Control
QMP	Quality Management Plan
RAM	Responsibility Assignment Matrix
RASCI	Responsible, Accountable, Support, Consulted, Informed
RBS	Resource Breakdown Structure
RFB	Request for Bid
RFI	Request for Information
RFP	Request for Proposal
RFQ	Request for Quotation
RMP	Risk Management Plan
SCOT	Strengths, Challenges, Opportunities and Threats
SDG	Sustainable Development Goals
SF	Start-to-Finish
SLBS	Saint Lucia Bureau of Standards
SMART	Specific, Measurable, Achievable, Realistic and Time bound

SOW	Statement of Work
SPI	Schedule Performance Index
SS	Start-to-Start
STEM	Science Technology Engineering and Mathematics
SV	Schedule Variance
SWOT	Strengths, Weaknesses, Opportunities, Threats
TCPI	To Complete Performance Index
tM	Most Likely
tO	Optimistic
TOR	Terms of Reference
tP	Pessimistic
TVET	Technical and Vocational Education and Training
UCI	Universidad Para La Cooperacion Internacional
UNDP	United Nations Development Programme
UPS	Uninterrupted Power Supply
WiFi	Wireless Fidelity
WBS	Work Breakdown Structure
XCD	Eastern Caribbean Dollars

EXECUTIVE SUMMARY

The Ciceron Secondary School's mission statement is, "to produce well rounded individuals who in the pursuit of excellence will make a positive difference in society, by empowering them with the necessary life skills, utilizing technology through an integrated curriculum, with the collaborative efforts of all social partners." Based on this statement, one can discern that technology is deemed a central element to all teaching and learning experiences at the Ciceron Secondary School (CICSS). Commissioned in 2003, the school had a thriving information and communications technology (ICT) culture. However, due to the deterioration of infrastructure, an unstable power supply (surges and fluctuations) and the end of service life of ICTs, these resources dwindled and, in some cases, became non-existent.

In 2013, through a project sponsored by the National Telecommunications Regulatory Commission (NTRC), the school was able to receive a necessary upgrade to its diminishing resources. This project was closed out in 2017. During the aforementioned period, the school was able to accomplish a number of milestones one of which was the advent of internal online school examinations and continued ICT integration which fostered improved academic performances.

The advent of the global COVID-19 pandemic accelerated the technological issues at the Ciceron Secondary School. Soon after, internet access within classrooms was limited to one block which housed the form five classes and two (2) form four classes. Servers and other technological devices also had limited functionality because of End of Life (EOL) and End of Service Life (EOSL) issues. Staff and students were restricted in their use of technology as a result of lack of resources. The decline in technological independence coincided with a further decrease in student academic performance and attendance, as well as low teacher morale. This was supported by the CICSS Annual Reports presented by the principal of the school. Further, the school's immediate technological support dwindled throughout the recent years as the Information Technology Lab Technician was transferred to the Ministry of Education, Innovation, Gender Relations and Sustainable Development (MOE).

Currently, there is no formalized project proposal document to procure, monitor, manage or control the upgrade of technological infrastructure and resources, and to provide technological support training at the CICSS. This PMP is, therefore, important to effectively assist with the execution of the project throughout its lifecycle.

The general project objective was to develop a Project Management Plan to upgrade existing technological infrastructure, technologies, improve academics, and the attendance and morale of the staff and students of the Ciceron Secondary School in Saint Lucia. The specific objectives were: to develop a Project Charter to present the Final Graduation Project (FGP) for authorization and to document the Project Manager's commitment to the project; to develop a Project Integration Management Plan to identify and coordinate the processes and activities within the project lifecycle; to create a sustainable scope management plan to establish the project deliverables and exclusions; to prepare a schedule

management plan to ensure completion of the project within a realistic and agreed timeframe; to create a Cost Management Plan to apply proper budgetary allocations and disbursement of funds throughout the project lifecycle; to create a Quality Management Plan to produce quality deliverables that meet the functional, educational and Science Technology Engineering and Mathematics (STEM) specifications of smart classrooms and laboratories; to create a Resource Management Plan to identify, acquire and manage all resources needed for the completion of the project; to develop a Communication Management Plan to effectively communicate the project status to stakeholders and sponsor; to develop a Risk Management Plan to identify and evaluate project risks to develop risk responses and mitigating measures; to develop a Procurement Management Plan for the project to implement proper procurement procedures and processes; and to develop a Stakeholder Management Plan to properly identify and manage stakeholder engagement.

The results section of this template of the PMP encompassed a detailed breakdown of each project deliverable. This will engender capacity building at the CICSS through the structural approach that the PMP offers. These were consistent with the requirements of the UCI where the PMP is being advocated by the professionals. This is in keeping with the vision and mission statements of the CICSS. The deliverables were aligned with the practices outlined in the Guide to the Project Management Body of Knowledge sixth edition (PMBOK Guide 6th Edition).

This was undoubtably a comprehensive approach to the development of the PMP as each deliverable and its importance were reinforced in the conclusion. The CICSS, NTRC and MOE were key stakeholders in the implementation of the PMP. Collaboration was evident throughout the document.

The recommendations presented herein were also in keeping with the concepts of sustainability and regenerative development practices. Climate change and global warming issues were two concerns of this project. These issues were addressed by advocating for change in the procurement process which was part of procurement management plan. Additionally, an alternative source of energy, namely, solar power, was explored as a potentially stable power source for CICCS and aptly fitted into both the procurement management and the quality management plans. These mitigating factors served as a starting point in the fight against climate change and global warming.

1. INTRODUCTION

The introduction provides a comprehensive foundation for the development of the CICSS project and the project management plans being proposed in this thesis. The researcher presents tihe background which examines the physical and human resources as well as the problem under investigation along with the research question, hypothesis, purpose and objectives of the thesis.

1.1 BACKGROUND

1.1.1 PHYSICAL INFRASTRUCTURE

The CICSS is situated on the western border of the Ciceron Community, along the access road which joins the said community to the Millennium Highway. The school building was completed in August 2003 and officially accommodated its first group of students in September 2003. The physical layout comprises fifteen (15) classrooms, nine (9) technical and vocational education and training (TVET) laboratories, and one (1) integrated science laboratory. The longstanding mandate of the school is to integrate ICT tools and resources into their Caribbean Secondary Education Certificate (CSEC) curricula and examinations.

The school's technological infrastructure was last upgraded in 2013 through an NTRC project. Since then, no attempts have been made to restore, upgrade or replace malfunctioning, damaged resources and equipment that have reached end of life or end of service life. This has, over time, hampered the execution of lessons, student ability to

complete key tasks and affected teacher morale when attempting core technology integration exercises.

1.1.2 STUDENT ENROLLMENT

CICSS' maximum student population is approximately four hundred and five (405) students according to the MOE student allocations. Annual statistics of the CICSS, revealed that on average, ninety (90) successful students from the Caribbean Primary Exit Assessment (CPEA), are annually assigned to the Form One (Grade 7) of the the school. According to Paul (2022), the annual survey results conducted by the MOE for the period 2017-2022 suggest that the registered CICSS student population comprises mainly of youth from low to middle income households who often do not possess the necessary resources for school or have internet access at home. Notably, the 2020-2021 CICSS principal's annual report also reveals that some other students who have internet access at home do not live in an environment conducive to learning or performing school work.

1.1.3 TEACHING STAFF

There are thirty-five (35) active classroom subject teachers at the CICSS, a Learning Resource Coordinator and a Special Education teacher. According to the CICSS annual report 2020-2021, the teacher-sex ratio, male to female, is about 2:5. Over 80% of the staff are graduate teachers and are qualified in their teaching content areas which should positively impact learning. Paul (2021), in his annual school report mentioned that two-thirds of the staff (approximately 20 teachers) are trained in pedagogy and their employment status is permanent. He further claimed that most teachers do not own personal

computers and are now dependent on school resources. Therefore, teachers are becoming increasingly dependent on the computers in the school's laboratories, most of which are non-functional; the unreliable classroom internet connections, which are traditionally plagued with reduced bandwidth latency; and the general lack of ICT resources, such as projectors, printers, laptops and other ICT manipulatives in the classroom.

1.1.4 PERFORMANCE

All collected data relating to the correction of scripts, were retrieved from Ciceron Secondary School Grade Summary Centre Statistics Report for the period June 2018-June 2022 administration of the CSEC examinations published by Caribbean Examinations Council (CXC). Statistics from 2021 disclosed that a total of seventy-five (75) students registered for the 2020 CSEC examinations. This comprised of thirty-two (32) males and forty-three (43) females. Five (5) students (two males and three females) were successful at passing five (5) or more subjects including Mathematics and English. Sixty-four (64) students wrote at least one (1) TVET subject and sixty-one (61) of them passed at least one (1).

According to the June 2022, CICSS Grade Summary Centre Statistics Report issued by CXC, the school recorded a 55.02% pass rate at the CXC June 2022 CSEC sitting, (Caribbean Examinations Council, 2022).

Based on the CICSS annual school report by Paul (2021), the school recorded a decline in student performance from the previous year of 61.17%. Four hundred and forty-

three (443) seats were registered, but three hundred and ninety-three (393) papers were sat. From this sitting, two hundred and fourteen (214) passes, at grade levels of I, II or III, were obtained. There were one hundred and eighteen (118) grade IV and sixty-one (61) grade V passes. No student registered grade VI results, (Paul, 2021). The school continues to record a downward spiral in student performance at the CSEC level for the fifth consecutive year.

In part, the success of the past years was largely due to the students' ability to access resource materials online, examination exercises and preparation, availability of customized subject resources online and engage in time management practices with their available (personal and school) technological resources at zero cost. Limited student technological access has meant an increased reliance on hard copy products, decelerated learning and reduced teacher innovation in lesson execution. Up until 2013, CICSS boasted the ability to conduct wide scale online examination exercises with immediate feedback to the students. This activity reduced stationery requests, reduced feedback timelines and provided students with meaningful opportunities for improvement, thus boosting overall student self-confidence and teacher morale. Teachers and students must now compete for laboratory space, internet access and devices.

1.1.5 STUDENT ATTENDANCE

The 2021-2022 monthly CICSS student attendance record revealed that, Form 1 and 2 students habitually attended school with a higher level of frequency than their peers in Forms 3, 4 and 5. The Forms 1 and 2 recorded an 80%-85% attendance range, while the Forms 3's and 4's registered a 70%-75% range. The Form 5's on the other hand averaged

60%-70% from January to November 2022. The reports' data further indicated that absenteeism at the Form 5 level was more prevalent.

Student school attendance at the higher form levels has always been a challenge, however, during the period 2013-2017, the school provided students with the necessary access to customized resources in the various subject disciplines to ensure their participation in prescribed technologically-based activities such as online classes and examinations. This was also facilitated through the further intervention of the NTRC project, which enhanced access to technology, provision of teaching and learning materials were made available online for students along with academic videos and other customized learning resources. The students came to school because there was a leveled playing field established, through program interventions, driven by the 'no child was left behind' ideologies.

Currently, contrasted with increased instances of no resources, absenteeism is at its highest at the fourth and fifth form levels, which translates into poor CSEC level academic performance.

1.1.6 TEACHER ATTENDANCE

The CICSS Annual Principal's Report for the period 2020-2021, stated that the culture of teacher regularity and punctuality has been maintained according to the CICSS teacher attendance statistics, as it revealed a 90% attendance for teachers. To date, as indicated by the teacher attendance reports of CICSS, the highest level of absenteeism

registered at CICSS was during the third term of 2021 when 29% teachers were absent on medical leave as a result of testing positive for COVID-19.

Declining academic performance, attendance inconsistencies, failing resources and limited access to technology and ICTs have resulted in a reduction in the quality of academic work being delivered in the classroom.

Teacher morale is steadily declining, as CICSS teachers are unable to attempt innovative or creative classroom lesson ideas, due to lack of accessible resources. CICSS academic sessions apparently continue to be a 'chalk and talk set-up' which most times results in more than half of the students being unable to follow the subject lesson as they are mainly tactile/kinesthetic learners. Notwithstanding, the administrative records indicate that CICSS teachers attend school regularly, despite the poor and reduced technological infrastructure and resources.

The proposed PMP is designed to address all the above concerns and highlight areas for immediate remedy. There is a need to mimic the period 2013-2017, where technological resources and infrastructure was readily available and student performance showed steady improvement. The proposed refurbishments, upgrades and replacements are necessary to foster a technological infusion at CICSS. However, this proposal is more extensive and moves beyond just procurement considerations. This PMP explores all ten (10) project knowledge areas and is developed in collaboration with all key stakeholders.

1.2 STATEMENT OF THE PROBLEM

The COVID-19 pandemic has exacerbated the technological inadequacy at the CICSS and exposed the lack of accesible, functional and appropriate ICT platforms and infrastructure for staff and students of the CICSS. Currently, no structured PMP templates exists to present a proposal to address the skeletal technological infrastructure, failing hardware and software, and lack of technological support training at the CICSS. Janssen (2022), noted that the Organisation for Economic Co-operation and Development (OECD) reports on average, across OECD Member countries that:

- 9% of 15 year old students do not have a quiet place to study in their homes and this is disproportionally the case among disadvantaged students;
- only about half of 15 year olds are enrolled in schools where an online learning support platform is available; and
- 35% of 15 year olds are enrolled in schools where teachers do not have the necessary pedagogical and technical skills to integrate digital technology in education, according to school principals.

Therefore, schools must close this gap and the CICSS has the capacity to do so if armed with the necessary tools and resources as were available between 2003 and 2013. A PMP is an effective way to effectively secure technological resources and re-establish robust systems to improve student academic learning outcomes. A 15%-30% improvement in student overall performance is a favorable desired outcome. The CICSS lacks adequate technological infrastructure, functional hardware, software and ICT related tools to impact

performance and the teaching learning environment. A possible solution is the development and execution of a PMP.

1.2.1 RESEARCH QUESTION

Would the Project Management Plan for the upgrading of existing technological infrastructure, technologies and support training provide at least a 30% improvement in the quality of student academic performance, teaching learning environment, attendance and morale of the staff and students of the Ciceron Secondary School in Saint Lucia?

1.2.2 RESEARCH HYPOTHESIS

A Project Management Plan to upgrade the existing technological infrastructure, technologies and support training for staff and students at the Ciceron Secondary School in Saint Lucia will improve the student performance and attendance, as well as teacher morale and attendance by at least 30%?

1.3 PURPOSE

The CICSS was once the beacon for technology integration education and technological resources in Saint Lucia. It boasted state of the art technological infrastructure, resources and good results in student performance both in academic and vocational studies. Over the years due to the neglect by MOE administrators, the school's infrastructure, technical resources, student performance and teacher morale have all been affected and these results can be easily substantiated. According to the Ciceron Secondary School Grade Summary Centre Statistics report for the period June 2018-2022

administration, school moved from a CSEC percentage pass rate of 85.77% in 2010 to 54.45% in 2021 to 55.02% in 2022. That period also marked the school's limited participation in national competitions and extra-curricular activities, this signals the need for an urgent intervention.

The lack of technological resources and infrastructure have in part accounted for poor performance, low attendance, declining staff morale and a dormant school environment. This is evident in the stock piled non-functioning computers and other resources, and limited Wireless Fidelity (WiFi) and internet access in classrooms and laboratories. This causes the delivery, execution and completion of classes to be a challenge. With limited or no technological resources or infrastructure, effective learning and participation cannot take place.

The annual principal's report for the periods 2019-2021 along with MOE annual survey results indicated that CICSS student cohort predominantly originate from the low to middle income family orientation, so requesting students to get their own technological resources has proven difficult. Further, attempts to provide students with internet access in the classroom have proven futile as the signal does not get beyond the doorway due to the poor infrastructural layout. It is against this backdrop that the researcher believes that the CICSS is in dire need of technological resources and an infrastructural upgrade to meet the demands of ever-changing curricula within the Science, Technology, Engineering and Mathematics (STEM) framework.

The PMP is a blueprint of project management and as such, the creation of a PMP, to permit infrastructural and technological improvements at CICSS, presents an opportunity to explore all the phases of project management from planning to close out. This encourages stakeholder buy-in as it displays professionalism and structure which will lead to improved teacher morale; and boost student success.

A good PMP reflects the best practices in the project world and the CICSS project will address the identified areas of weakness and strength through the development of subsidiary knowledge area plans including a(n) Integration Management Plan, Scope Management Plan, Schedule Management Plan, Cost Management Plan, Quality Management Plan, Resource Management Plan, Communication Management Plan, Risk Management Plan, Procurement Management Plan, and Stakeholder Management Plan.

Generally, the following benefits are anticipated from the PMP a(n):

- Increase the probability to successfully achieve the desired project objectives;
- Provide a systematic approach for the coordination of processes and activities;
- Foster stakeholder confidence being developing a formal document, which is a best practice tool in the project world, to steer project activities;
- Serve as a reference point for similar projects as all projects require the development of a PMP;
- Establish effective communication mechanisms among stakeholders and
- Promote monitoring and control procedures throughout the project lifecycle.

If executed successfully, this PMP can:

- Upgrade the infrastructure and ICT integration into various subject disciplines;
- Improve the teaching-learning environment;
- Improve student and teacher access to technological tools and resources;
- Reduce on the amount of paper used by the school, especially at examination time;
- Improve student performance;
- Boost teacher morale; and
- Increase student chances of employability.

1.4 GENERAL OBJECTIVE

To develop a Project Management Plan to upgrade existing technological infrastructure, technologies, improve academics, and the attendance and morale of the staff and students of the Ciceron Secondary School in Saint Lucia.

1.5 SPECIFIC OBJECTIVES

1.5.1 To develop a Project Integration Management Plan to identify and coordinate the processes and activities within the project lifecycle.

1.5.2 To create a sustainable scope management plan to establish the project deliverables and exclusions.

1.5.3 To prepare a schedule management plan to ensure completion of the project within a realistic and agreed timeframe.

1.5.4 To create a Cost Management Plan to apply proper budgetary allocations and disbursement of funds throughout the project lifecycle.

1.5.5 To create a Quality Management Plan to produce quality deliverables that meets the functional, educational and STEM specifications of a smart classrooms and laboratories.

1.5.6 To create a Resource Management Plan to identify, acquire and manage all resources needed for the completion of the project.

1.5.7 To develop a Communication Management Plan to effectively communicate the project status to stakeholders and sponsor.

1.5.8 To develop a Risk Management Plan to identify and evaluate project risks to develop risk responses and mitigating measures.

1.5.9 To develop a Procurement Management Plan for the project to implement proper procurement procedures and processes.

1.5.10 To develop a Stakeholder Management Plan to properly identify and manage stakeholder engagement.

2. THEORETICAL FRAMEWORK

The Theoretical Framework includes the concepts, their definitions, existing theories within the field of research. This chapter further demonstrates an understanding and connection of theories and concepts that are relevant to this research paper.

2.1 COMPANY/ENTERPRISE FRAMEWORK

2.1.1 COMPANY/ENTERPRISE BACKGROUND

The CICSS's curriculum was established in 2003, with technology integration and technology use as a fundamental part of its programmes. In 2013, these technological resources were upgraded and replaced by a project sponsor, NTRC. The NTRC project came to a close in 2017. Since then, no attempts have been made to restore, upgrade or replace malfunctioning or damaged resources and equipment that have reached EOL or EOSL. As a result, all technologically-driven programmes at the CICSS have come to a halt, or are operating on a skeleton framework or are creating little to no impact on students and staff. This has resulted in poor student performance, low student attendance and low staff morale.

According to the MOE student allocations the CICSS has the capacity to house four hundred and five (405) students and a current staff complement of thirty-five (35) persons. The principal's annual reports for the period 2017-2022 noted that, at its peak, the school boasted a CSEC examination percentage pass rate range of 75%-85.77% and a student attendance rate of well over 85%.

The researcher believes that with the provision of adequate resources and infrastructural upgrades, the CICSS can be given the opportunity to function at its optimum and ultimately increase student performance and attendance, improve staff morale and stimulate an environmentally-rich educational climate.

2.1.2 MISSION AND VISION STATEMENTS

2.1.2.1 MISSION STATEMENT

The Ciceron Secondary School endeavours to produce well-rounded individuals who in the pursuit of excellence will make a positive difference in society, by empowering them with the necessary life skills, utilizing technology through an integrated curriculum, with the collaborative efforts of all social partners *(CICSS School Development Plan 2017-2021).*

2.1.2.2 VISION STATEMENT

The Ciceron Secondary School focuses on creating a unique learning environment for the total development of every student through quality instruction, positive social interaction and shared leadership, *(CICSS School Development Plan 2017-2021).*

2.1.3 ORGANIZATIONAL STRUCTURE

Saint Lucia is divided into eight (8) educational districts. The CICSS falls within District IV. In Figure 1, the hierarchical organizational structure of the CICSS is presented as headed by the Education Officer for District IV. The principal and vice principal are the direct leaders of the school. The project manager, for this project, will have high-level

authority over the project's execution and budget and will report to the principal. The principal will be responsible for disseminating information to the staff and appraising the District Education Officer of project developments.

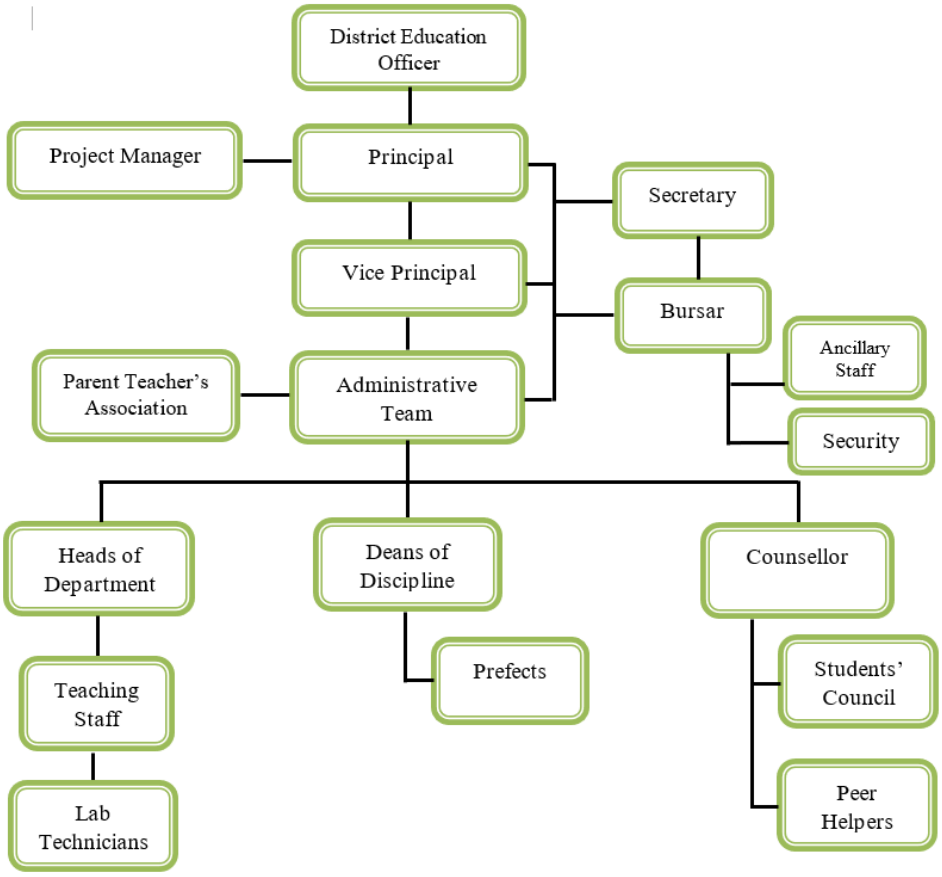


Figure 1: Organizational Chart of the Ciceron Secondary School

(Source: Author of the study)

2.1.4 PRODUCTS OFFERED

The CICSS offers a comprehensive curriculum inclusive of STEM technologies. Subject offerings are grouped into two (2) categories, namely, Academic and TVET, the latter includes the Arts and Sports subjects. In the Academic curriculum, there are twelve (12) subject groupings and in the TVET curriculum has a further nine (9) subject

groupings. These twenty-one (21) subjects are all offered at the CSEC level. Extracurricular activities include volleyball, cricket, netball, athletics, Peer Helpers and Red Cross.

2.2 PROJECT MANAGEMENT CONCEPTS

This subsection presents information on the main project management concepts including the project, project management, project lifecycle, knowledge areas, project management processes, process groups and any other applicable matters. The relationships between these concepts will be explored based on the topics to be developed for the FGP. The company/enterprise context will also be presented.

2.2.1 PROJECT

A project is a temporary endeavor undertaken to create a unique product, service or result (PMI, 2017). Yarbrough (2021), further iterates that a project is a set of tasks that must be completed in order to arrive at a particular goal or outcome. Depending on the size and scope of the project, these tasks may be simple or elaborate, but all projects can be broken down into objectives and the tasks which needs to be done to achieve them.

Projects are managed by organizations and individuals with a wide range of objectives. These can take very simple forms to more complex ones, e.g., from planning an event to completing a task to even constructing a building. Based on the above definitions and explanations, the PMP, for the upgrade of existing technological infrastructure, technological resources and the provision of technological support training for the staff and

students of the CICSS in Saint Lucia, is in keeping with the requirement of the FGP as requested by Universidad Para La Cooperacion Internacional (UCI).

2.2.2 PROJECT MANAGEMENT

The Project Management Institute (PMI) defines project management as the use of specific knowledge, skills, tools and techniques to deliver something of value to people. This FGP involves the development of a PMP as part of the Planning Process Group and lies within the knowledge area of Project Integration Management. A PMP is defined as the document that describes how the project is executed, monitored and controlled, and closed (PMI, 2017). The process of defining, preparing and coordinating all plan components and consolidating them into an integrated PMP (PMI, 2017).

The PMI (2017), states that the PMP should be robust enough to respond to an ever-changing project environment. The dynamics of this FGP lends itself to such a situation. This reinforces the concept that the PMP is an “application of processes, methods, skills, knowledge and experience to achieve specific project objectives according to the project acceptance criteria within agreed parameters” (Association for Project Management [APM], n.d.).

There have been other projects involving the upgrade and refurbishment of technological infrastructure at the CICSS, however, none has had a PMP with a sustainable and regenerative component Thus, this is a novel undertaking for the CICSS.

2.2.3 PROJECT LIFECYCLE

A project lifecycle is the series of phases that a project passes through from its start to its completion (PMI, 2017). It provides the basic framework for managing the project. This basic framework applies regardless of the specific project work involved. The Project Lifecycle is connected to the Process Groups and, in turn, the ten (10) knowledge areas. This is highlighted in Figure 2 below.

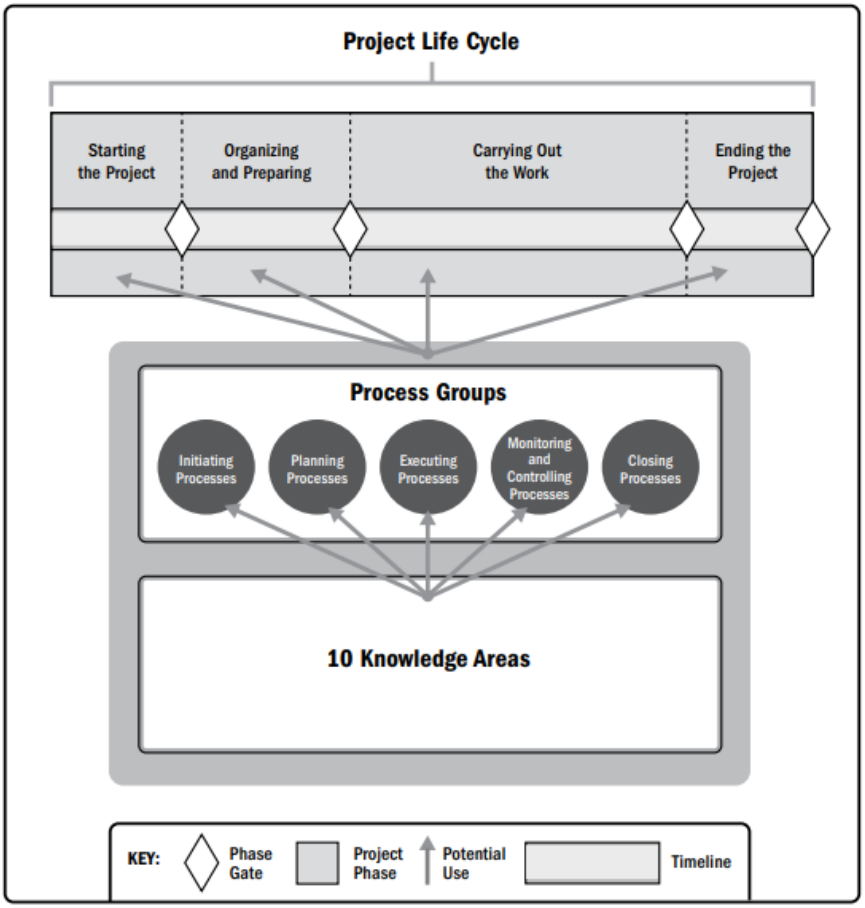


Figure 2: Interrelationship of PMBOK Guide Key Components in Projects

(Source: PMI, 2017)

Eby (2018), states that project management can be divided into five (5) phases which include the project being initiated, defined and planned, executed, monitored and controlled, and closing out. This is synonymous with what is presented in the PMI (2017), and is depicted in Figure 3 below.

Figure 3: Five Phases of Project Management

(Source: https://www.smartsheet.com/blog/demystifying-5-phases-project-management)

A hybrid lifecycle is a combination of a waterfall (predictive) and an agile (adaptive) lifecycle. A hybrid lifecycle approach will be utilized in the planning and execution of the PMP. Elements of the project that are well known or have fixed requirements follow a predictive development lifecycle, and those elements that are still evolving follow an adaptive development lifecycle (PMI, 2017). Vasiliauskas (2022), suggested that the waterfall approach can be used for planning, only for high-level deadlines, deliverables and contracts with customers and introduce agile (adaptive) execution phase for project tasks. More specifically agree only on top level things like final deadlines, milestones, deliverables or classical project phases. Identify phases of a project

where agile methods can be used. The rule here could be if the phase duration is longer than a month, it is worth switching to agile (Vasiliauskas, 2022).

Vasiliauskas (2022), presented a step-by-step plan for the use of agile techniques which include, but are not limited to the following activities:

1. Identify project work types and attempt to breakdown them into tasks which can be completed in less than a day;
2. Create a prioritized work backlog which fulfills a project phase or whole project goal/milestone;
3. Agree to work in iterations (sprints) of two (2) or four (4) weeks. Two (2) weeks is good for less experienced teams when more alignment is required;
4. Before every iteration, plan what your project team will work on by identifying prioritized items from the work backlog;
5. Estimate the duration of every task to know about how many you can fit into single sprint; and
6. In the end of every sprint do a retrospective assessment, i.e., what went well and what can be improved, and capture metrics on how many tasks and total estimation was completed.

Additionally, captured completion metrics must be used to adjust your next sprint planning process. Figures 4 and 5 captured the approach to be used in this FGP.

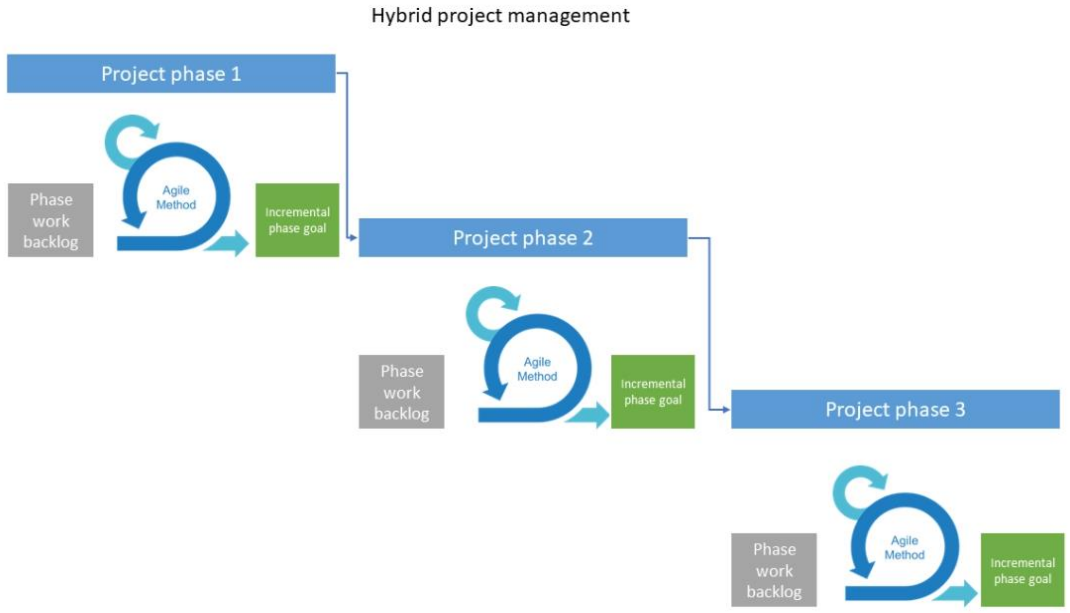


Figure 4: Hybrid Project Management Methodology

(Source: https://teamhood.com/project-management-resources/hybrid-project-management/)

Waterfall	Agile	Hybrid
Project Work Breakdown Schedule	Project Backlog	Phase Backlogs
Detailed project planning	Iteration planning	High level planning + iteration planning
Early definition of project goal	Agreement of goal with constant learning and adapting via smaller goals	Agreement of goal with constant learning and adapting via smaller milestones
Focus on stages	Focus on early result	Focus on end result for each phase
Emphasis on documentation and details	Emphasis on value delivered	Emphasis on value delivered
Fixed budget	Variable budget	Flexible or fixed budget
Well defined goals	Unclear or estimated goals	Estimated or well defined goals
Long to medium duration	Short to medium duration	Any duration
Great when resources are partially available	Works best when resources are fully available	More flexible when resources are partially available but still works best with full availability
Time critical delivery	Fast paced delivery	Time critical delivery combined with fast pace for early learning
Fixed scope	Unknown/variable scope	Fixed or somewhat variable scope
Harder to change	Easiest to change	Easier to change

Figure 5: Hybrid Project Management Methodology

(Source: https://teamhood.com/project-management-resources/hybrid-project-management/)

2.2.4 PROJECT MANAGEMENT PROCESSES

The project lifecycle is managed by executing a series of project management activities known as project management processes (PMI, 2017). Every project management process produces one (1) or more outputs from one (1) or more inputs by using appropriate project management tools and techniques (PMI, 2017).

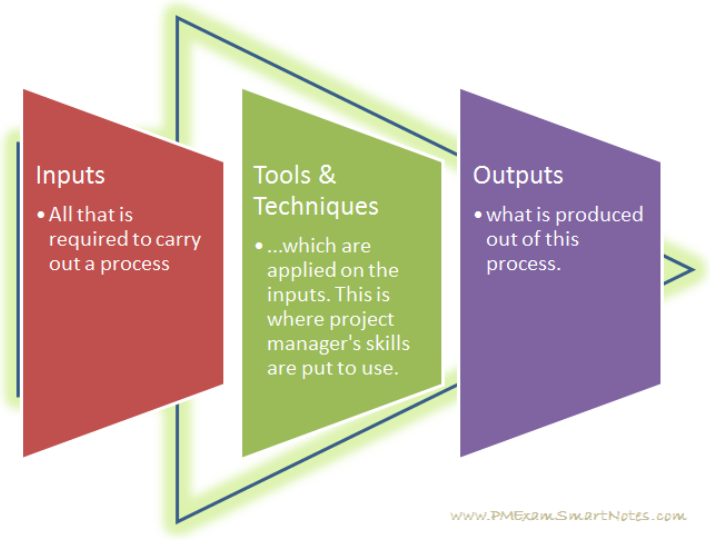


Figure 6: Generic Project Management Processes

(Source: https://www.pmexamsmartnotes.com/project-management-body-of-knowledge/)

Figure 6 illustrates Shenoy's (2021), interpretation of each project management activity being accomplished as a process. A process has some inputs. A set of tools and techniques are then applied on these inputs. As a result, some outputs are produced which may become further inputs to some other process(es).

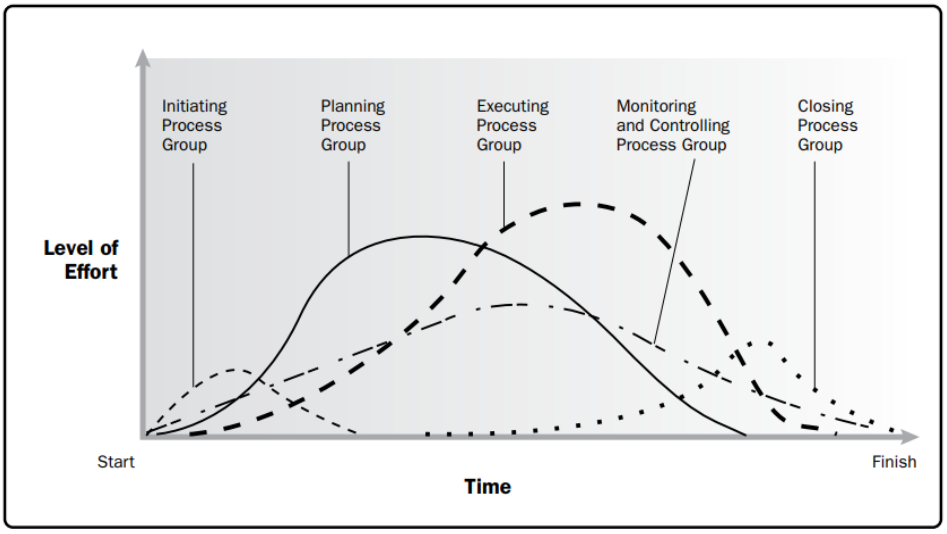


Figure 7: Project Management Process Groups

(Source: PMI, 2017)

A project management process group is a logical grouping of project management processes used to achieve specific project objectives (PMI, 2017). The PMI (2017) grouped the project management processes into five (5) categories or process groups. According to PMI (2017), the five (5) project management process groups include:

1. **Initiating Process Group** which are performed to define a new project or a new phase of an existing project by obtaining authorization to start the project or phase;
2. **Planning Process Group** which are processes required to establish the scope of the project, refine the objectives, and define the course of action required to attain the objectives that the project was undertaken to achieve;
3. **Executing Process Group** which are processes performed to complete the work defined in the PMP to satisfy the project requirements;

4. **Monitoring and Controlling Process Group** which are processes required to track, review and regulate the progress and performance of the project; identify any areas in which changes to the plan are required; and initiate the corresponding changes; and
5. **Closing Process Group** which are processes performed to formally complete or close the project, phase, or contract.

Figure 7 illustrates the interaction and level of effort of each process group. This interaction is not linear and occurs throughout the life of the project. The interrelationships of each process group is also highlighted therein.

Table 1-4. Project Management Process Group and Knowledge Area Mapping

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
4. Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work 4.4 Manage Project Knowledge	4.5 Monitor and Control Project Work 4.6 Perform Integrated Change Control	4.7 Close Project or Phase
5. Project Scope Management		5.1 Plan Scope Management 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS		5.5 Validate Scope 5.6 Control Scope	
6. Project Schedule Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Durations 6.5 Develop Schedule		6.6 Control Schedule	
7. Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
8. Project Quality Management		8.1 Plan Quality Management	8.2 Manage Quality	8.3 Control Quality	
9. Project Resource Management		9.1 Plan Resource Management 9.2 Estimate Activity Resources	9.3 Acquire Resources 9.4 Develop Team 9.5 Manage Team	9.6 Control Resources	
10. Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Monitor Communications	
11. Project Risk Management		11.1 Plan Risk Management 11.2 Identify Risks 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Responses	11.6 Implement Risk Responses	11.7 Monitor Risks	
12. Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	
13. Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Engagement	13.3 Manage Stakeholder Engagement	13.4 Monitor Stakeholder Engagement	

Figure 8: Project Management Process Group and Knowledge Area Mapping

(Source: PMI, 2017)

The focus and deliverables of this FGP is primarily limited to the initiating, planning groups, and to a limited extent the executing process group. The phases of the

executing, monitoring and controlling, and closing process groups are completely outside the scope, schedule and budget of the FGP. Figure 8 illustrates the linkage between the process groups and the knowledge areas.

2.2.5 PROJECT MANAGEMENT KNOWLEDGE AREAS

A knowledge area is an identified area of project management defined by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools and techniques (PMI, 2017). The PMI (2017), speaks of the ten (10) knowledge areas that are used on most projects and they include:

1. Project Integration Management;
2. Project Scope Management;
3. Project Schedule Management;
4. Project Cost Management;
5. Project Quality Management;
6. Project Resource Management;
7. Project Communications Management;
8. Project Risk Management;
9. Project Procurement Management; and
10. Project Stakeholder Management.

All ten (10) knowledge areas form an integral part of this PMP. Figure 9 provides a summary outline of each of the ten (10) knowledge areas as outlined in the PMI (2017).

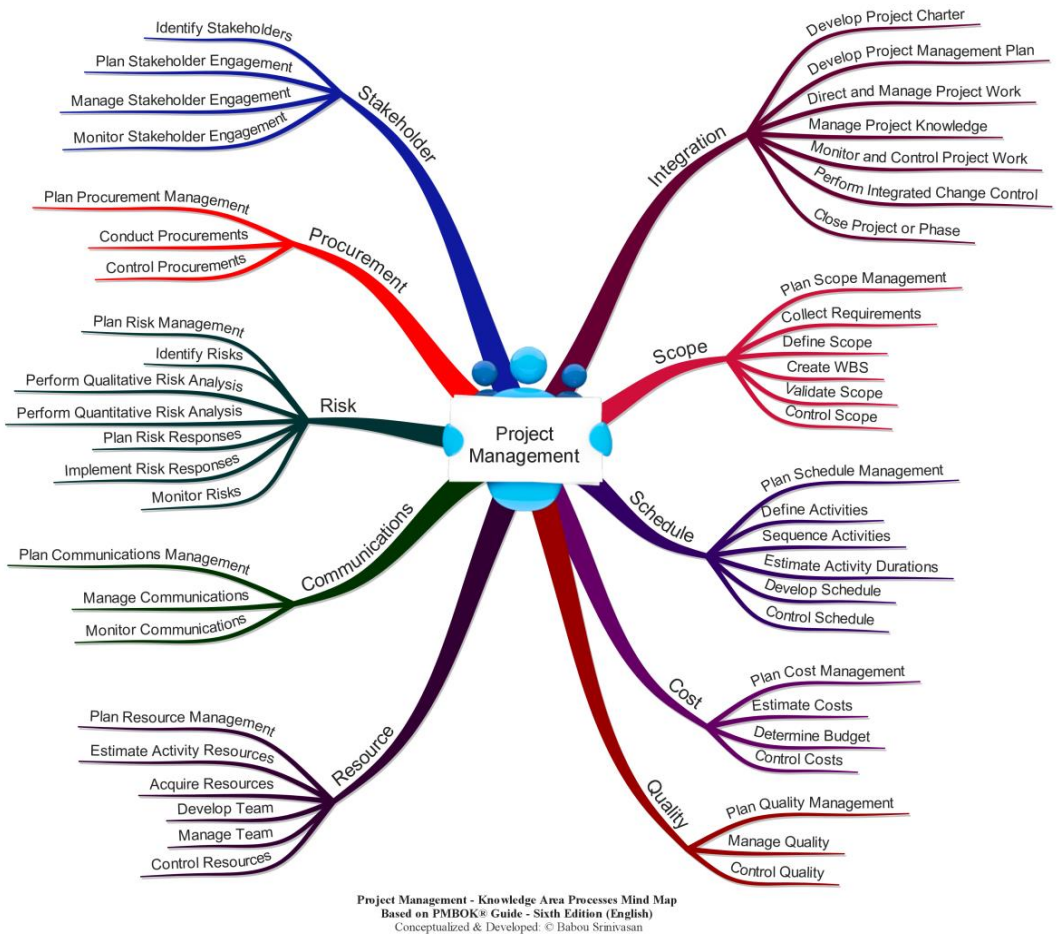


Figure 9: Project Management Knowledge Area Processes Mind Map

(Source: https://leadershipchamps.wordpress.com/project-management-mind-maps/based-on-pmbok-6th-edition/)

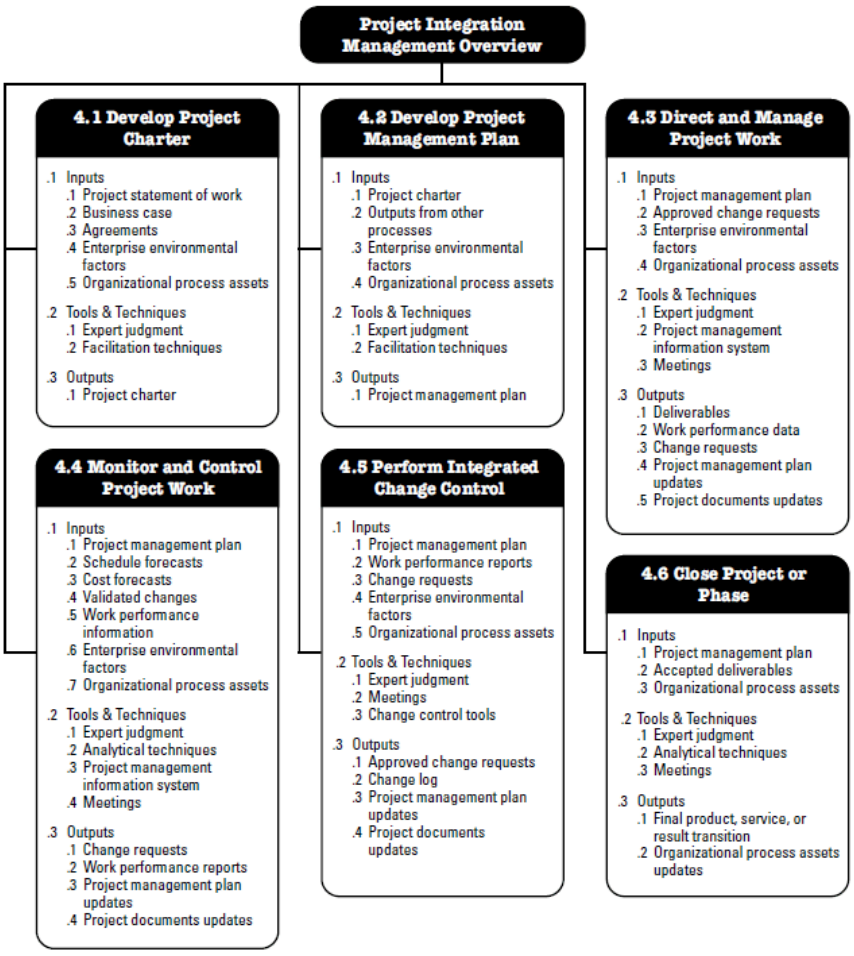


Figure 10: Project Integration Management Overview

(Source: http://www.projectengineer.net/wp-content/uploads/2016/02/knowledge-area-integration.png)

Project Integration Management is the processes and activities to identify, define, combine, unify and coordinate the various processes and project management activities within the Project Management Process Groups (PMI, 2017). The processes involved in Project Integration Management are outlined in Figure 10 above and are to develop the Project Charter and PMP.

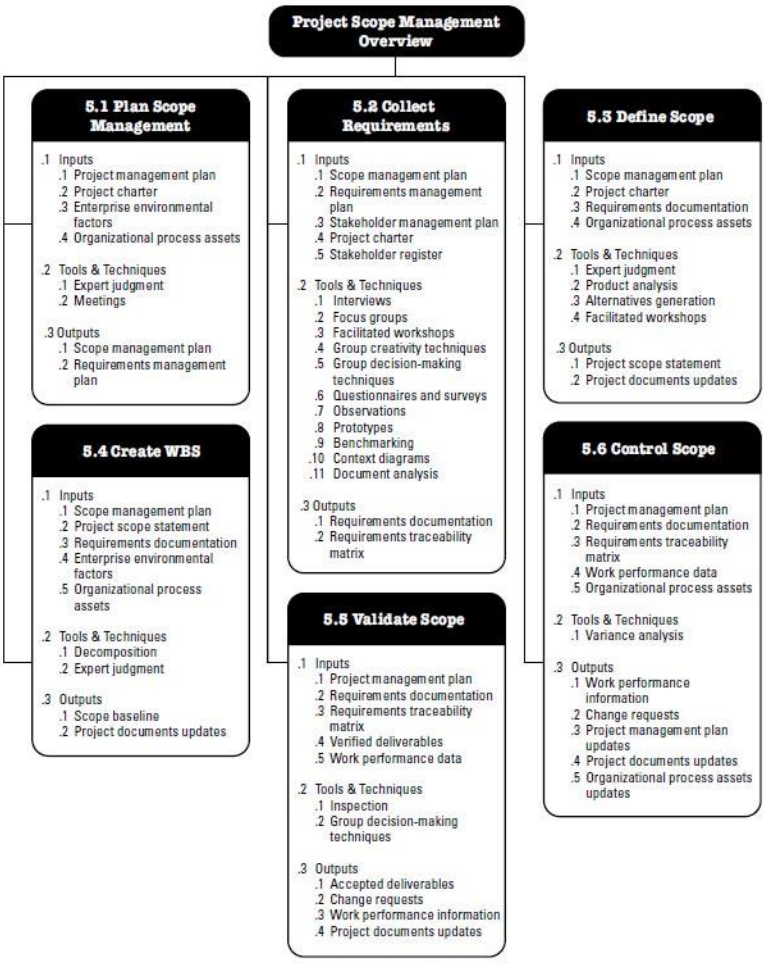


Figure 11: Project Scope Management Overview

(Source: http://www.projectengineer.net/wp-content/uploads/2018/02/knowledge-area-scope.png)

PMI (2017), states that "Project Scope Management are the processes required to ensure the project includes all the work required, and only the work required, to complete the project successfully" (p. 129). All projects must have a scope management plan; and specific, measurable, achievable, relevant and time-bound (SMART) objectives to achieve project goals. Project scope management consists of the six (6) processes that determine, validate and control the project parameters. The plan scope management, collect

requirements, define scope, create work breakdown structure (WBS), validate scope and control scope are all outlined in the FGP. The processes involved in Project Scope Management are outlined in Figure 11 above.

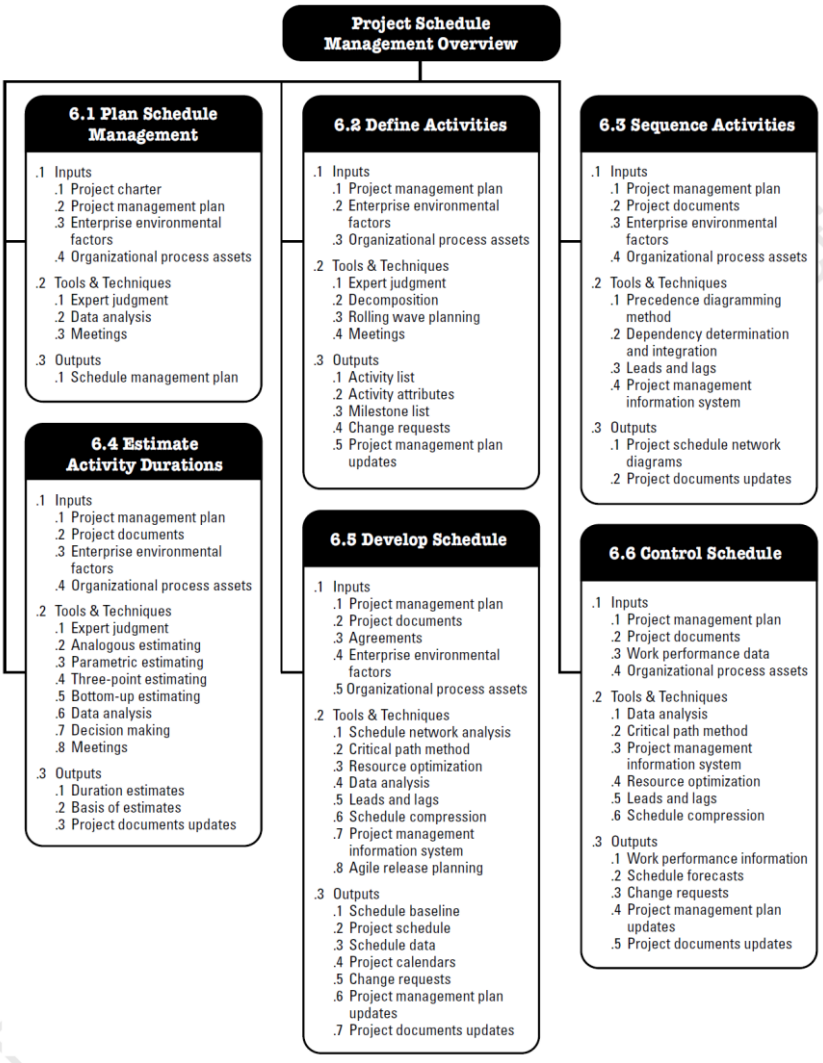


Figure 12: Project Schedule Management Overview

(Source: http://www.projectengineer.net/wp-content/uploads/2018/08/pmbok-knowledge-area-project-schedule-management.png)

According to PMI (2017), "Project Schedule Management includes the processes required to manage the timely completion of the project" (p. 173). The project schedule

forms part of the triple constraints in project management along with scope and cost. Figures 9 and 12 displays the six (6) processes in Project Schedule Management. All six (6) processes were considered in this FGP: Plan Schedule Management, Define Activities, Sequence Activities, Estimate Activity Durations, Develop Schedule and Control Schedule. Key stakeholders will play an integral part in the development of the project schedule management plan.

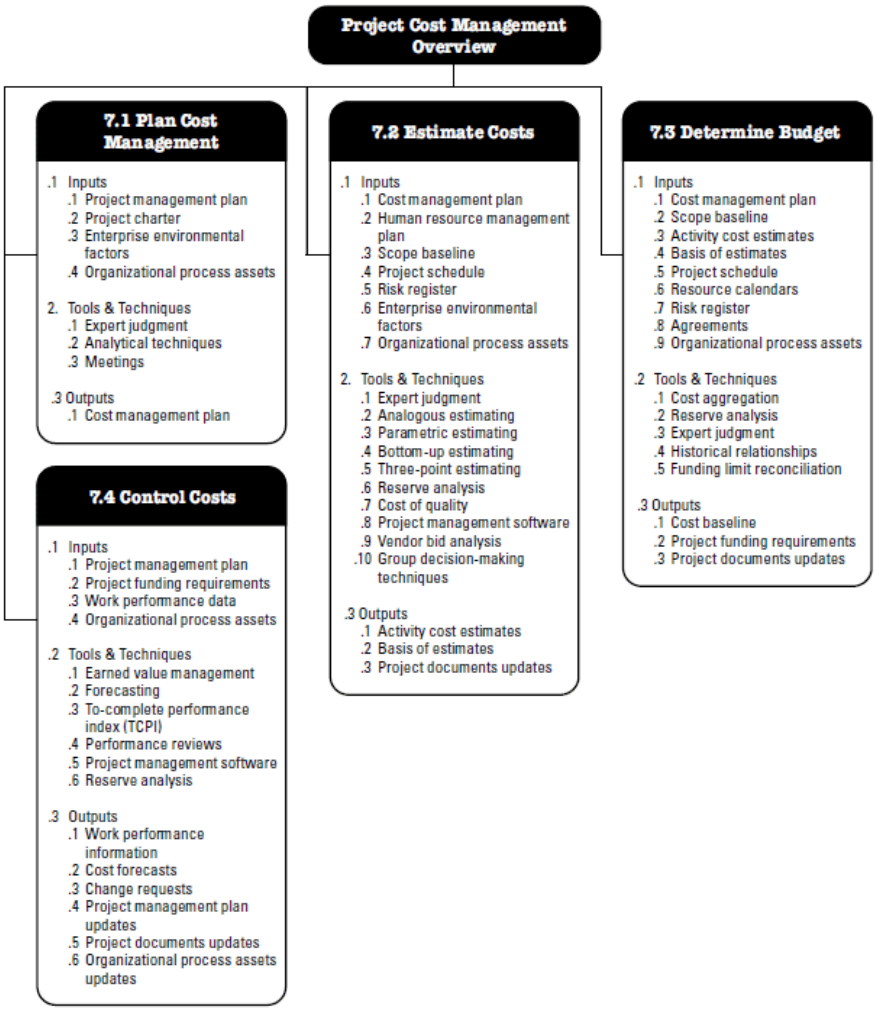


Figure 13:Project Cost Management Overview

(Source: http://www.projectengineer.net/wp-content/uploads/2016/02/knowledge-area-cost.png)

PMI (271), points out that "Project Cost Management includes the processes involved in planning, estimating, budgeting, financing, funding, managing and controlling costs so the project can be completed within the approved budget" (p. 231). This is represented in Figures 9 and 13. Project Cost Management is dependent on the adequate planning and estimation of accurate budgetary forecasts.

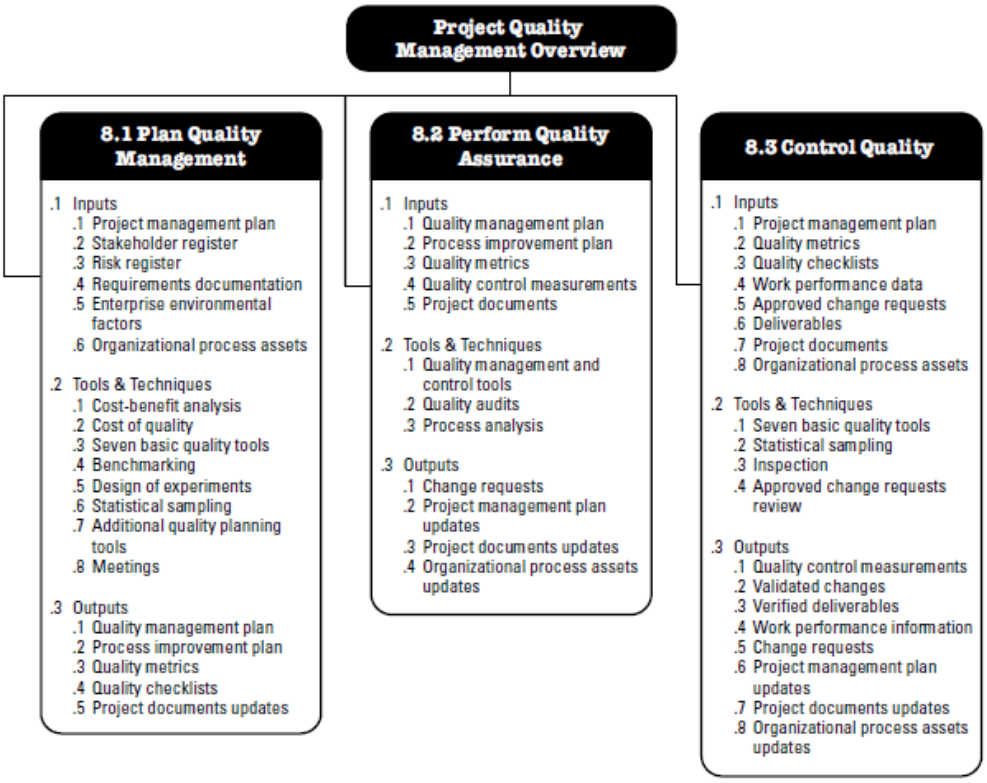


Figure 14: Project Quality Management Overview

(Source: http://www.projectengineer.net/wp-content/uploads/2016/02/knowledge-area-quality.png)

PMI (2017), notes that the "Project Quality Management includes the processes for incorporating the organization's quality policy regarding planning, managing and controlling project and product quality requirements, in order to meet stakeholders' expectations" (p. 271). Plan Quality Management, Perform Quality Assurance and Control

Quality processes will be used in the execution of this project. Especially in the monitoring of resources for procurement paying attention to EoL and EoSL dates and deadlines. Figure 14 above outlines the plan quality management process.

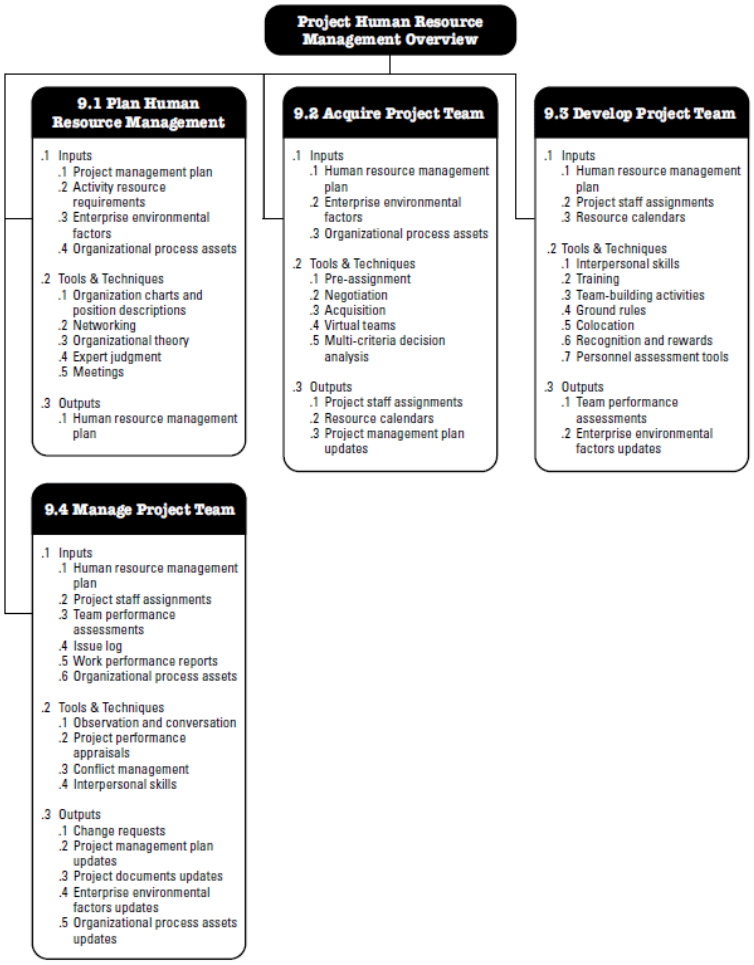


Figure 15: Project Human Resource Management Plan Overview

(Source: http://www.projectengineer.net/wp-content/uploads/2016/02/knowledge-area-human-resource.png)

PMI (2017), states that "Project Resource Management includes the processes to identify, acquire and manage the resources needed for the successful completion of the project" (p. 307). The CICSS project will require both physical and human resources. The four (4) processes outlined in Figure 15 above will form an active part of this FGP.

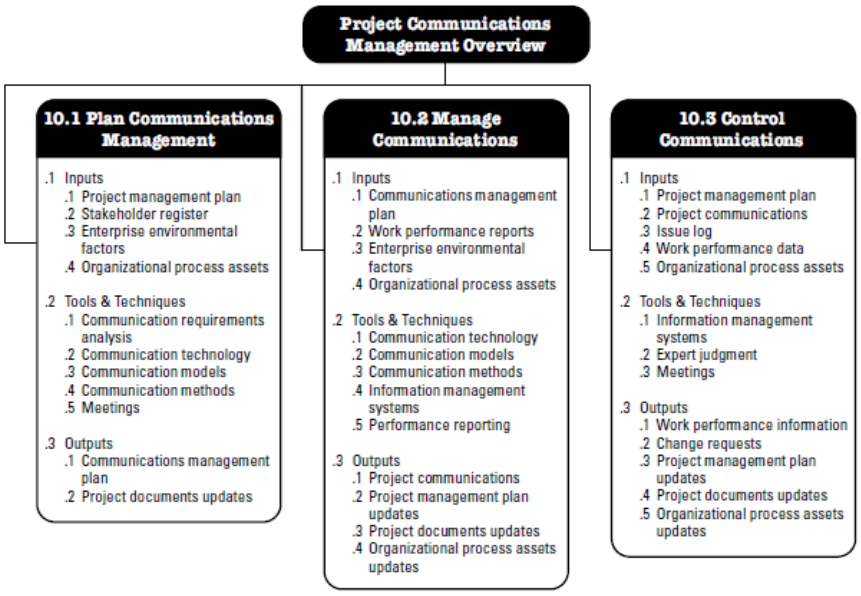


Figure 16: Project Communications Management Overview

(Source: http://www.projectengineer.net/wp-content/uploads/2016/02/knowledge-area-communication.png)

According to PMI (2017), "Project Communications Management includes the processes required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring and, ultimately, the disposition of project information" (p. 359). The nature of this project requires that communications management forms the focal point of its execution. There are various types of stakeholders that must be communicated with in a professional and welcoming manner. Miscommunication can cause delays, errors and create a hostile work environment. The communication management plan will ensure that all stakeholder communication needs are managed and monitored by the project.

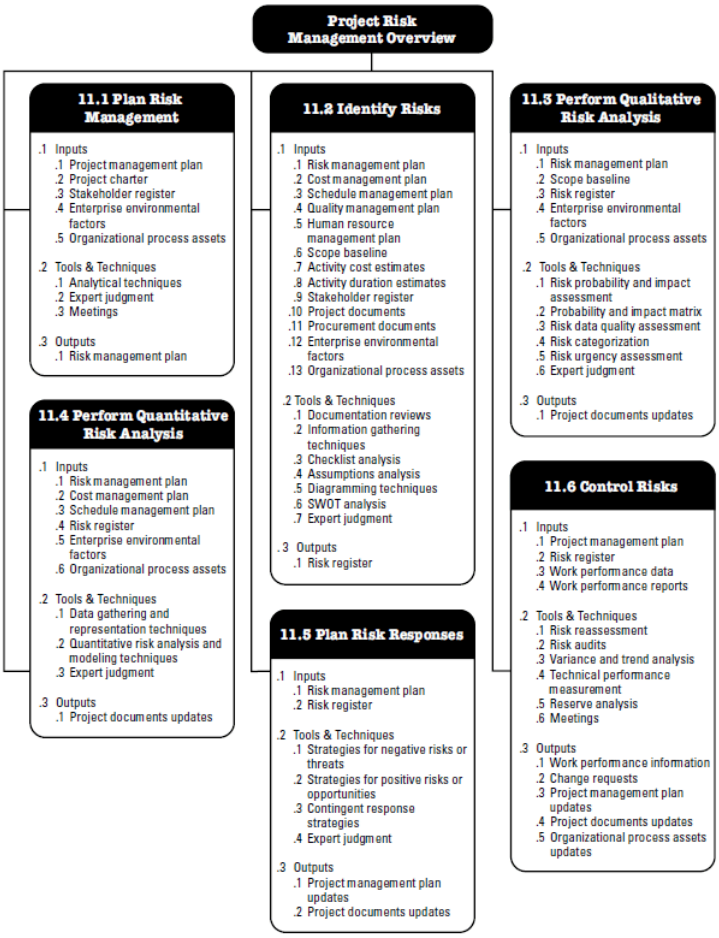


Figure 17: Project Risk Management Overview

(Source: http://www.projectengineer.net/wp-content/uploads/2016/02/knowledge-area-risk.png)

PMI (2017), states that the "Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation and monitoring risk on a project" (p. 395). The Project Risk Management processes are highlighted in Figures 9 and 17.

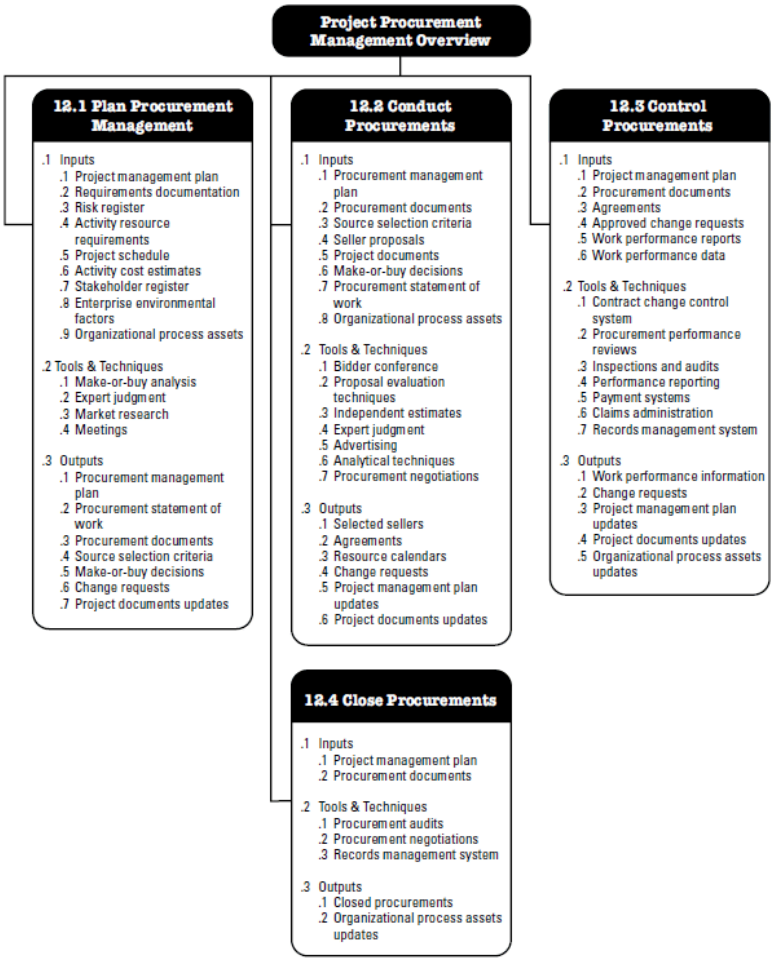


Figure 18: Project Procurement Management Overview

(Source: http://www.projectengineer.net/wp-content/uploads/2016/02/knowledge-area-procurement.png)

According to PMI (2017), "Project Procurement Management are the processes necessary to purchase or acquire products, services or results needed from outside the project team" (p. 459). All goods and services for this project have to be procured from outside sources. The project sponsor in collaboration with the project manager through its project management office will be the ones responsible for conducting the procurement process.

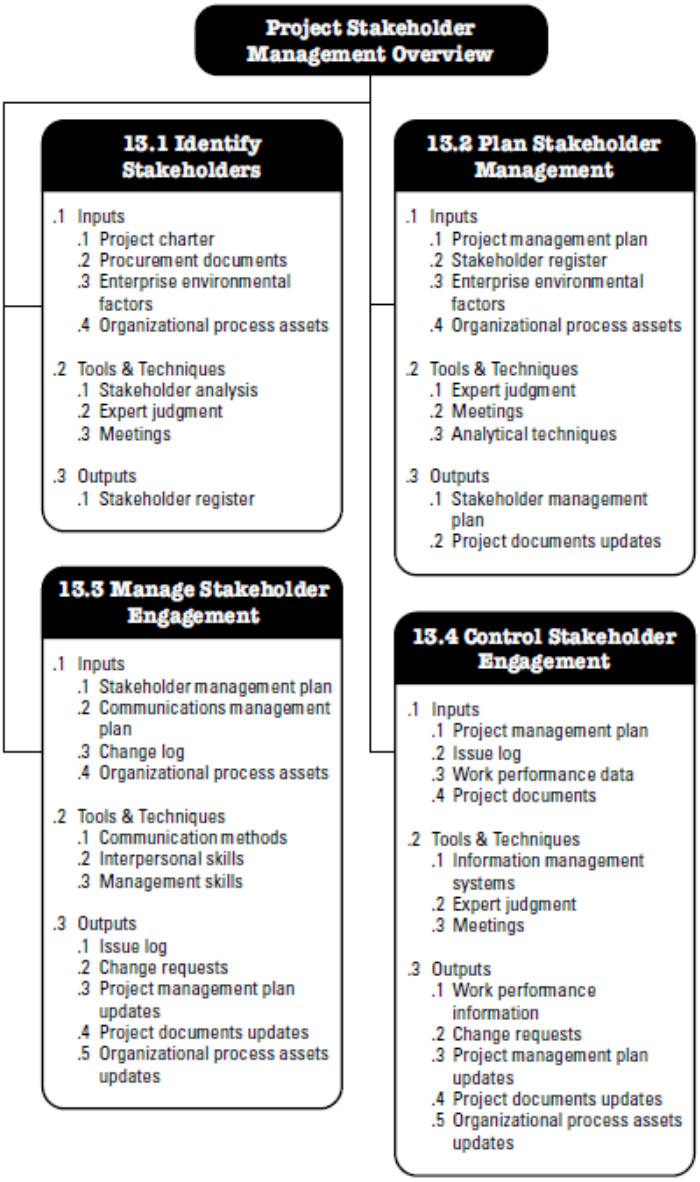


Figure 19: Project Stakeholder Management Overview

(Source: http://www.projectengineer.net/wp-content/uploads/2016/02/knowledge-area-stakeholder.png)

PMI (2017) notes that "Project Stakeholder Management includes the processes required to identify the people, groups or organizations that could impact or be impacted by the project; to analyze stakeholder expectations and their impact on the project; and to

develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution" (p. 503). Identify Stakeholders, Plan Stakeholder Engagement, Manage Stakeholder Engagement and Monitor Stakeholder Engagement are the four (4) processes that encompass the stakeholder engagement plan as represented in Figure 19 below. The stakeholder management plan and communication management plans work hand in hand to ensure a successful project outcome.

2.3 OTHER APPLICABLE THEORY/CONCEPTS RELATED TO THE PROJECT TOPIC AND CONTEXT

2.3.1 REGENERATIVE DEVELOPMENT

The concept of regenerative development should be more widespread in the education circles if we are to combat global warming and attain the Sustainable Development Goals (SDGs) 2030. According to the (United Nations, 2022), United Nations Development Programme (UNDP), the SDGs, also known as the Global Goals, were adopted by the United Nations in 2015 as a universal call to action to end poverty, protect the planet and ensure that by 2030 all people enjoy peace and prosperity.

Children are never too young to become advocates, innovators or entrepreneurs. The researcher believes that with this PMP the seed can be planted at the CICSS through the use of the technologies that will be afforded to the staff and students. Gabel (2015), defined regenerative development as the use of resources to improve society's wellbeing in a way that builds the capacity of support systems needed for future growth.

"The regenerative approach reinforces the need for a holistic approach, integrating six (6) processes of the human ecosystem, i.e., environmental, social, economic, political, cultural and spiritual" (Müller, n.d., 13). Children need to begin to function with this concept in mind and the school is the best place to start. Caniglia (2018), for instance, reiterates that creating a regenerative future will require every level of society to adopt a new set of values and to reorganize in ways that facilitate collaboration, evolution and innovation.

2.3.2 SUSTAINABLE TECHNOLOGIES

The company Rubicon describes sustainable technology as an umbrella term to describe innovation that considers natural resources, and fosters economic and social development. The goal of these technologies is to drastically reduce environmental and ecological risks, and to create a sustainable product.

Rachelson (2021), further stated that sustainable technology can be looked at in three (3) ways which include:

- **Substitution**, i.e., the technology fosters a shift from non-biodegradable to biodegradable materials in its production. It also replaces non-renewable with renewable resources;
- **Prevention**, i.e., the sustainable technology prevents deterioration, contamination and other negative environmental impacts through its use or production; and
- **Efficiency**, i.e., the technology is efficient in terms of its use of energy and resources.

Sustainable technologies can be incorporated in the procurement management plan to ensure that the technologies being upgraded and procured lends itself to sustainable technologies.

2.3.3 GREEN TECHNOLOGY IN EDUCATION

Sadh (2019), states that green education is inculcating and cultivating the values, skills and knowledge towards the sustainability of the environment. Green education programming creates interest among the students to think about the future. Sadh (2019), further reiterates that preservation and sustainability must be part of our school's educational program and the green education program is the only way to develop or create awareness in the mind of a future generation.

The development of a PMP for this FGP can create avenues for the integration of elements of regenerative development, inclusions of sustainable technologies and accessibility to green technology in education at the CICSS. The PMP will add value to the project and sensitize stakeholders to the need to think holistically about their contribution to the project.

3. METHODOLOGICAL FRAMEWORK

The methodological framework is the part of our research where we expose the theoretical and practical methods used to analyze the problem posed or the topic we are investigating. The methodological framework refers to the research participants and sample, instruments or equipment used, the research design and procedure, and data analysis (Javed, 2022).

The type of research method being explored in this research is the mixed method. George (2021), explains that the mixed methods research combines elements of quantitative research and qualitative research in order to answer your research question. This method utilizes the strengths of both the qualitative and quantative hence allowing the researcher to explore the diverse perspectives that exist. The Harvard Catalyst (2022), presented a rationale for using the mixed method of research which is congruent to those espoused in this research. It states that one is able to

- obtain different, multiple perspectives: validation
- build a comprehensive understanding
- have better contextualized measures
- explain statistical results in more depth
- track the process of the intervention
- study outcomes and stakeholder engagement

(Rationale for Using Mixed Method, para. 4)

3.1 INFORMATION SOURCES

Information sources are the various means by which information is recorded for use by an individual or organization (Lisbdnetwork, 2022). The Network further explained that, information sources is the means by which a person is informed about something or knowledge is availed to someone, a group of people or an organization. Information sources can be in print, non-print and electronic media or format (Ajuwon, 2018).

The West Virginia University, Institute of Technology stated that information was ubiquitous. For example, media, blogs, personal experiences, books, journal and magazine articles, expert opinions, encyclopedias and web pages are all types of information sources. Figure 1 below shows the various types of information sources under which the examples mentioned above can be categorized by researchers.

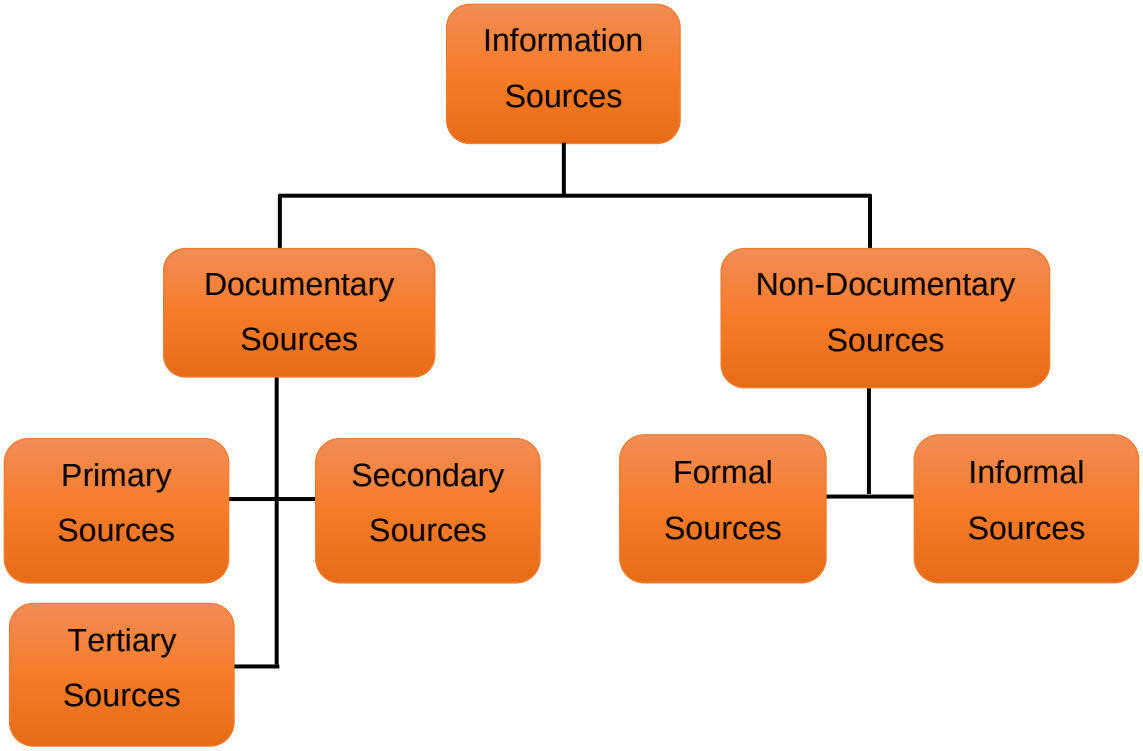


Figure 20: Types of Information

(Source: https://www.lisedunetwork.com/sources-of-information/)

3.1.1 PRIMARY SOURCES

Libguides (2022), defines a primary source of information as an original document containing firsthand information about a topic. It is further stated that different fields of study may use different types of primary sources. Primary sources allow researchers to get as close as possible to original ideas, events and empirical research. Such sources may include government documents, reports minutes of meetings, interview transcripts, survey and questionnaire results, statistical data and the publication of the results of empirical observations or research.

3.1.2 SECONDARY SOURCES

Secondary sources analyze, review or summarize information in primary resources or other secondary resources (Libguides, 2022). Libguides (2022), states that even sources presenting facts or descriptions about events are secondary unless they are based on direct participation or observation. A secondary source contains commentary on or discussion about a primary source. The most important feature of secondary sources is that they offer an interpretation of information gathered from primary sources (Libguides, 2022). Such sources may include PMBOK Guides 6^{th} and 7^{th} editions, and Journal Articles on Technology Resources and Staff Morale.

Chart 1: Information Sources

(Source: Author of study)

Objectives	Information Sources	
	Primary	Secondary
1. To develop a project integration management Plan to identify and coordinate the processes and activities within the project lifecycle.	Interviews with Heads of department, Surveys (questionnaires), Minutes of meetings with stakeholders, Statistical data.	PMBOK® Guide 6th and 7th Edition, Reports on Education, Principal's Annual Reports, Journal Articles on Technology Resources and Staff Morale, CSEC reports, National ICT Policy, MOE guidelines and standards.
2. To create a sustainable scope management plan to establish the project deliverables and exclusions.	Interviews, Surveys (questionnaires), Minutes of meetings with stakeholders, Statistical data.	PMBOK® Guide 6th and 7th Edition, Reports on Education, Principal's Annual Reports, Journal Articles on Technology Resources and Staff Morale, CSEC reports, National ICT Policy PMI database, internet, MOE guidelines and standards

Objectives	Information Sources	
3. To prepare a schedule management plan to ensure completion of the project within a realistic and agreed timeframe.	Interviews, Surveys (questionnaires), Minutes of meetings with stakeholders, Statistical data.	PMBOK® Guide 6th and 7th Edition, Reports on Education, Principal's Annual Reports, Journal Articles on Technology Resources and Staff Morale, CSEC reports, National ICT Policy PMI database, internet, MOE guidelines and standards
4. To create a cost management plan to apply proper budgetary allocations and disbursement of funds throughout the project lifecycle.	Interviews, Surveys (questionnaires), Minutes of meetings with stakeholders, Statistical data.	Similar Project Documents, PMBOK® Guide 6th and 7th Edition, Reports on Education, Principal's Reports, PMI database, MOE guidelines and standards, NTRC guidelines and standards
5. To create a quality management plan to produce quality deliverables that	Interviews, Surveys (questionnaires), Minutes of meetings with stakeholders, Statistical data.	PMBOK® Guide 6th and 7th Edition, Reports on Education, Principal Reports, Principal's Annual

Objectives	Information Sources	
meets the functional, educational and STEM specifications of a smart classrooms and laboratories.		Reports, Journal Articles on Technology Resources and Staff Morale, CSEC reports, National ICT Policy PMI database, internet, MOE guidelines and standards
6. To create a resource management plan to identify, acquire and manage all resources needed for the completion of the project.	Interviews, Surveys (questionnaires), Minutes of meetings with stakeholders, Statistical data.	Previous Research, PMBOK® Guide 6th and 7th Edition, Reports on Education, Principal's Annual Reports, Journal Articles on Technology Resources and Staff Morale, CSEC reports, National ICT Policy PMI database, internet, MOE guidelines and standards
7. To develop a communication management plan for the effective	Interviews, Surveys (questionnaires), Minutes of meetings with stakeholders, Statistical data.	PMBOK® Guide 6th and 7th Edition, Reports on Education, Principal's Annual Reports, Journal

Objectives	Information Sources	
communication of the project status to stakeholders and sponsor.		Articles on Technology Resources and Staff Morale, CSEC reports, National ICT Policy PMI database, internet, MOE guidelines and standards
8. To develop a risk management plan to identify and evaluate project risks, and to develop risk response and mitigating measures.	Interviews, Surveys (questionnaires), Minutes of meetings with stakeholders, Statistical data.	PMBOK® Guide 6th and 7th Edition, Reports on Education, Principal's Annual Reports, Journal Articles on Technology Resources and Staff Morale, CSEC reports, National ICT Policy PMI database, internet, MOE guidelines and standards
9. To develop a procurement management plan for the project to implement proper procurement	Interviews, Surveys (questionnaires), Minutes of meetings with stakeholders, Statistical data.	Procurement Guidelines for technology in schools, NTRC guidelines, historical information for similar projects, PMBOK® Guide 6th and 7th Edition,

Objectives	Information Sources	
procedures and processes.		Reports on Education, Principal's Annual Reports, Journal Articles on Technology Resources and Staff Morale, CSEC reports, National ICT Policy PMI database, internet, MOE guidelines and standards
10. To develop a stakeholder management plan that will properly identify and manage stakeholder engagement.	Interviews, Surveys (questionnaires), Minutes of meetings with stakeholders, Statistical data.	PMBOK® Guide 6th and 7th Edition, Reports on Education, Principal's Annual Reports, Journal Articles on Technology Resources and Staff Morale, CSEC reports, National ICT Policy PMI database, internet, MOE guidelines and standards

3.2 RESEARCH METHODS

Research methods are the strategies, processes or techniques utilized in the collection of data or evidence for analysis in order to uncover new information or create better understanding of a topic (Libguides, 2022).

3.2.1 ANALYTICAL METHODS

The analytical research proceeds from unknown to known. Analysis means breaking up of the problems in hand so that it ultimately gets connected with something obvious or already known. It is the process of the unfolding of a problem or of conducting its operation to know its hidden aspects (Gurugubelli, 2020). It starts with what is to be found out and moves from an abstract to concrete concept.

3.2.2 THE SYNTHETIC METHOD

The synthetic method is the opposite to the analytic method. It proceeds from known to unknown (Gurugubelli, 2020). It is the process of putting together known bits of information to reach the point where unknown information becomes obvious and true (Gurugubelli, 2020).

3.2.3 INDUCTIVE REASONING

Inductive reasoning is a method of drawing conclusions by going from the specific to the general (Bhandari, 2022). It is usually contrasted with deductive reasoning, where you go from general information to specific conclusions (Bhandari, 2022). Inductive reasoning is also called inductive logic or bottom-up reasoning.

3.2.4 DEDUCTIVE REASONING

Deductive reasoning is a logical approach where you progress from general ideas to specific conclusions (Bhandari, 2022). It is contrasted with inductive reasoning, where you start with specific observations and form general conclusions. Deductive reasoning is also called deductive logic or top-down reasoning.

3.2.5 STATISTICAL ANALYSIS

Statistical analysis is the process of collecting and analyzing data to identify patterns, relationships and trends, and inform decision-making (Bender, 2022).

3.2.6 OBSERVATION

Observational research is a research technique where you observe participants and phenomena in their most natural settings (Yee, 2022). This enables researchers to see their subjects make choices and react to situations in their natural setting, as opposed to structured settings like research laboratories or focus groups.

3.2.7 ANALOGOUS ESTIMATING

Analogous estimating is a method for estimating the duration or cost of an activity or a project using historical data from a similar activity or project (PMI, 2022).

Chart 2: Research Methods

(Source: Author of study)

Objectives	Research Methods			
	Analytical-Synthetic	**Inductive-Deductive**	**Observation**	**Statistical**
1. To develop a project integration management plan to identify and coordinate the processes and activities within the project lifecycle.	Provided insight from various literary sources into the processes, inputs, tools, techniques and outputs required to create an integration management plan			
2. To create a sustainable scope management plan to establish the project deliverables and exclusions.		This method will be used in the data collection process and to collect the requirements for the	This method will be used to provide supporting material and make informed decision in the	Provide supporting data in guiding the scope of the project.

Objectives	Research Methods			
		project.	preparation and execution of the scope management plan.	
3. To prepare a schedule management plan to ensure completion of the project within a realistic and agreed timeframe.	Using information from the sources identified in Chart 1 objective 4 above, to drive decision making when creating the documents that will comprise the time management plan.	Plan meeting with experts to gather qualitative data for reports.	Observe and record various perspectives, experiences and requirements involved in creating the schedule management plan.	
4. To create a cost management plan to apply proper budgetary allocations and	The information would aid in the design of the budget requirements related to the			Analyzing data provided by project sponsors, stakeholders

Objectives	Research Methods			
disbursement of funds throughout the project lifecycle.	project. Use of literary sources to guide the processes, inputs, tools, techniques and outputs required to create a cost management plan			and similar projects.
5. To create a quality management plan to produce quality deliverables that meets the functional, educational and STEM specifications of a smart classrooms and	Information obtained from this method would assist in understanding and identifying the quality, technical and standards requirements for the project.	This method will be applied when analyzing data (qualitative and quantitative) provided by project sponsors, stakeholders, and similar		

Objectives	Research Methods			
laboratories.		projects.		
6. To create a resource management plan to identify, acquire and manage all resources needed for the completion of the project.	This method will be used to gather expert advice and judgment based on the requirements of the project.	This method will be applied when analyzing data provided by project sponsors, stakeholders, and similar projects.		Data collected from surveys will be used to guide the development of the resource management plan.
7. To develop a communication management plan for the effective communication of the project status to stakeholders and sponsor.	The information gathered from this method will be used to guide the decision-making process when creating the documents that will comprise the communications management plan.			

Objectives	Research Methods			
8. To develop a risk management plan to identify and evaluate project risks, and to develop risk response and mitigating measures.	Data gathered will provide insight and provide the necessary data for the development of the risk management plan.	Expert judgment, resources and coordination will be used in the development of a risk management plan for the project.		Based on the data collected and research conducted this method will be used to formulate the risk management plan.
9. To develop a procurement management plan for the project to implement proper procurement procedures and processes.	Data and information obtained during research process will be used to develop an appropriate framework to plan, conduct and control procurements	Data and information gathered from technical experts will assist in the process to plan, conduct and control procurements related to the		The information and data obtained from this method would aid in the process of plan, conduct and control

Objectives	Research Methods			
	related to the project	project.		procurements.
10. To develop a stakeholder management plan that will properly identify and manage stakeholder engagement.	This method will assist with understanding stakeholder needs and expectations.	This method will assist in the identification of stakeholders, expectations, needs, identify, plan, manage and monitor stakeholder engagements.	This method aids with the management and monitoring of stakeholders.	This method aids with the management and monitoring of stakeholders.

3.3 TOOLS

The PMI (2017) defines tools as something "tangible, such as a template or software program, used in performing an activity to produce a product or result".

3.3.1 EXPERT JUDGMENT

Expert judgment is defined as judgment provided based upon expertise in an application area, knowledge Area, discipline, industry, et cetera, as appropriate for the

activity being performed. Such expertise may be provided by any group or person with specialized education, knowledge, skill, experience or training (PMI, 2017).

3.3.2 BRAINSTORMING

This technique is used to identify a list of ideas in a short period of time. It is conducted in a group environment and is led by a facilitator. Brainstorming comprises two (2) parts: idea generation and analysis. Brainstorming can be used to gather data and solutions or ideas from stakeholders, subject matter experts and team members when developing the project charter (PMI, 2017).

3.3.3 FOCUS GROUPS

Focus groups bring together stakeholders and subject matter experts to learn about the perceived project risk, success criteria, and other topics in a more conversational way than a one-on-one interview (PMI, 2017).

3.3.4 INTERVIEWS

Interviews are used to obtain information on high-level requirements, assumptions or constraints, approval criteria and other information from stakeholders by talking directly to them (PMI, 2017).

3.3.5 MEETING MANAGEMENT

Meeting management is taking steps to ensure meetings meet their intended objectives effectively and efficiently (PMI, 2017).

3.3.6 MEETINGS

Are used to discuss and address pertinent topics of the project when directing and managing project work (PMI, 2017).

3.3.7 QUESTIONNAIRES

A written sets of questions designed to quickly accumulate information from a large number of respondents (PMI, 2017)

3.3.8 CHECKLIST

A checklist may guide the project manager to develop the plan or may help to verify that all the required information is included in the PMP (PMI, 2017).

3.3.9 DECOMPOSITION

A technique used for dividing and subdividing the project scope and project deliverables into smaller more manageable parts (PMI, 2017).

3.3.10 EARNED VALUE ANALYSIS

Earned value analysis compares the performance measurement baseline to the actual schedule and cost performance. EVM integrates the scope baseline with the cost baseline and schedule baseline to form the performance measurement baseline (PMI, 2017).

3.3.11 HISTORICAL INFORMATION REVIEWS

Documents and data on prior projects including project files, records, correspondence, closed contracts and closed projects. Reviewing historical information can assist in developing parametric estimates or analogous estimates. Historical information may include project characteristics (parameters) to develop mathematical models to predict total project costs (PMI, 2017).

3.3.12 TREND ANALYSIS

An analytical technique that uses mathematical models to forecast future outcomes based on historical results (PMI, 2017).

Chart 3: Tools

(Source: Author of study)

Objectives	Tools
1. To develop a project integration management plan to identify and coordinate the processes and activities within the project lifecycle.	Expert Judgment, change control tools and meetings.
2. To create a sustainable scope management plan to establish the project deliverables and exclusions.	Expert judgment, meetings, interviews, data analysis, group decision-making techniques, decomposition, data gathering, brainstorming, focus groups
3. To prepare a schedule management plan to ensure completion of the project within a	Expert judgment, meetings, data analysis, decomposition, analogous estimating, project

Objectives	Tools
realistic and agreed timeframe.	management information system: Microsoft Project, Gantt chart
4. To create a cost management plan to apply proper budget allocation and disbursement of funds throughout the project lifecycle.	Expert judgment, alternative analysis, reserve analysis, cost of quality, analogous estimating, historical information review, earned value analysis, trend analysis
5. To create a quality management plan to produce quality deliverables that meets the functional, educational and STEM specifications of a smart classrooms and laboratories.	Benchmarking, brainstorming, interviews, cost of quality, expert judgment, questionnaires, performance reviews, audits, inspection, checklists
6. To create a resource management plan to identify, acquire and manage all resources needed for the completion of the project.	Expert judgment, responsibility assignment matrix (RAM), resource breakdown structure, alternative analysis, bottom-up estimating, analogous estimating, parametric analysis, data representation: Hierarchical Chart
7. To develop a communication management plan for the effective communication of the project status to stakeholders and sponsor.	Expert judgment, communication requirements analysis, communication technology, checklists, communication models, communication methods, project reporting, meetings, stakeholder engagement matrix

Objectives	Tools
8. To develop a risk management plan to identify and evaluate project risks, and to develop risk response and mitigating measures.	Expert judgment, stakeholder analysis. Interviews, checklist, brainstorming, root cause analysis, strengths, weaknesses, opportunities and threats (SWOT) analysis, document analysis, risk categorization, probability and impact matrix, risk probability and impact assessment, assessment of other risks, decision tree analysis, influence diagrams, cost benefit analysis, alternative analysis, strategies for overall project risks, audits, performance analysis.
9. To develop a procurement management plan for the project to implement proper procurement procedures and processes.	Expert judgment, market research, source selection analysis, proposal evaluation, advertising, performance reviews, earned value analysis, trend analysis.
10. To develop a stakeholder management plan to properly identify and manage stakeholder engagement.	Expert judgment, questionnaires, brainstorming, stakeholder analysis, stakeholder mapping, stakeholder engagement matrix, root cause analysis, benchmarking, stakeholder analysis, power and interest matrix, power and influence matrix.

3.4 ASSUMPTIONS AND CONSTRAINTS

3.4.1 ASSUMPTION

A factor in the planning process that is considered to be true, real or certain, without proof or demonstration. (PMI, 2017).

3.4.2 CONSTRAINT

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

Chart 4: Assumptions and Constraints

(Source: Author of study)

Objectives	Assumptions	Constraints
1. To develop and project integration management plan to identify and coordinate the processes and activities within the project lifecycle.	The project charter will be created and approved in a timely manner. All processes are clearly identified, completed and integrated smoothly in the project.	Vague and sketchy estimates and information due to limited details available for project charter creation. Processes are unclear and not properly developed in the project management plan.
2. To create a sustainable scope management plan to establish the project deliverables and exclusions.	Project scope is well defined with all parameters detailed by project management team.	Frequent changes to project scope causes delays in the commencement of the project.

Objectives	Assumptions	Constraints
3. To prepare a schedule management plan to ensure completion of the project within a realistic and agreed timeframe.	Estimated projections and timeframes are accurate. The project is on schedule and does not have significant delays.	Availability and access to financing impacts project timeframe. Project funding must be secured at start.
4. To create a cost management plan to apply proper budgetary allocations and disbursement of funds throughout the project lifecycle.	Detailed and realistic budget developed by project team.	Change in prices, along with supply chain issues for equipment and materials, inflate the cost of project.
5. To create a quality management plan to produce quality deliverables that meets the functional, educational and STEM specifications of a smart classrooms and laboratories.	Project adheres to national and regional quality standards and will be within allocated budget.	Quality standards are not met as a result of not being able to source the required quality resources for the deliverables.

Objectives	Assumptions	Constraints
6. To create a resource management plan to identify, acquire and manage all resources needed for the completion of the project.	The project has access to adequate human and physical resources.	Resources may not be available for the execution of the project.
7. To develop a communication management plan for the effective communication of the project status to stakeholders and sponsor.	Communication with stakeholders will be conducted effectively and efficiently using suitable media of communication.	Deliverables and milestones may not be effectively or efficiently communicated to stakeholders.
8. To develop a risk management plan to identify and evaluate project risks, and to develop risk response and mitigating measures.	All risks are identified, and the contingency and mitigation plans that will be put in place will be effective in minimizing risks.	High impact risks or a force majeure may cause critical delays in the project.
9. To develop a procurement	Sustainable and eco-friendly equipment and materials are	Supply chain issues and import tariffs cause delays in

Objectives	Assumptions	Constraints
management plan for the project to implement proper procurement procedures and processes.	easily accessible by competent contractors and is within the estimated cost.	the availability of materials.
10. To develop a stakeholder management plan to properly identify and manage stakeholder engagement.	A high level of stakeholder collaboration towards the successful completion of the project.	Stakeholder requirements level of interest, influence and power change during the project due to slow progress of work.

3.5 DELIVERABLES

A deliverable is any unique and verifiable product, result or capability to perform a service that is required to be produced to complete a process, phase or project. Deliverables are typically the outcomes of the project and can include components of the PMP (PMI, 2017).

3.5.1 PROJECT INTEGRATION MANAGEMENT PLAN

Project integration management includes the processes and activities to identify, define, combine, unify and coordinate the various processes and project management activities within the Project Management Process Groups (PMI, 2017). A project charter is defined as a document issued by the project sponsor that formally authorizes the existence

of a project and provides the project manager with the authority to apply organizational resources to project activities (PMI, 2017).

3.5.2 SCOPE MANAGEMENT PLAN

Scope management plan describes how the scope will be defined, developed, monitored, controlled and validated (PMI, 2017).

3.5.3 SCHEDULE MANAGEMENT PLAN

A schedule management plan is a component of the PMP that establishes the criteria and the activities for developing, monitoring and controlling the schedule (PMI, 2017).

3.5.4 COST MANAGEMENT PLAN

A cost management plan describes how the project costs will be planned, structured and controlled (PMI, 2017).

3.5.5 QUALITY MANAGEMENT PLAN

A quality management plan describes how applicable policies, procedures and guidelines will be implemented to achieve the quality objectives (PMI, 2017).

3.5.6 RESOURCE MANAGEMENT PLAN

A resource management plan provides guidance on how project resources should be categorized, allocated, managed and released (PMI, 2017).

3.5.7 COMMUNICATION MANAGEMENT PLAN

A communication management plan describes how project communications will be planned, structured, implemented and monitored for effectiveness (PMI, 2017).

3.5.8 RISK MANAGEMENT PLAN

A risk management plan describes how risk management activities will be structured and performed (PMI, 2017).

3.5.9 PROCUREMENT MANAGEMENT PLAN

A procurement management plan contains the activities to be undertaken during the procurement process. It should document whether international competitive bidding, national competitive bidding, local bidding, et cetera, should be done (PMI, 2017).

3.5.10 STAKEHOLDER MANAGEMENT PLAN

A stakeholder management plan is a component of the PMP that identifies the strategies and actions required to promote productive involvement of stakeholders in decision making and execution. (PMI, 2017).

Chart 5: Deliverables

(Source: Author of study)

Objectives	Deliverables
1. To develop a project integration management plan to identify and coordinate the processes and activities within the project lifecycle.	Project charter will be signed and authorized during graduation seminar to allow for the development of the FGP and project integration management plan.
2. To create a sustainable scope management plan to establish the project deliverables and exclusions.	Scope management plan will describe how the project scope will be defined, developed, monitored, controlled and validated.
3. To prepare a schedule management plan to ensure completion of the project within a realistic and agreed timeframe.	Schedule management plan will establish criteria and activities to develop, monitor and control the project schedule.
4. To create a cost management plan to apply proper budgetary allocations and disbursement of funds throughout the project lifecycle.	Cost management plan will describe how costs will be planned, structured and controlled.
5. To create a quality management plan to produce quality deliverables that meets the functional, educational and STEM specifications of a smart classrooms and laboratories.	Quality management plan will describe how policies, procedures and guidelines will be implemented.
6. To create a resource management plan to	Resource management plan will describe how

Objectives	Deliverables
identify, acquire and manage all resources needed for the completion of the project.	project resources will be acquired, allocated, monitored and controlled.
7. To develop a communication management plan to effectively communicate the project status to stakeholders and sponsor.	Communication management plan will describe the administration and dissemination of project information.
8. To develop a risk management plan to identify and evaluate project risks, and to develop risk response and mitigating measures.	Risk management plan will describe how to structure and perform risk management activities.
9. To develop a procurement management plan for the project to implement proper procurement procedures and processes.	Procurement management plan will describe how to acquire external goods and services.
10. To develop a stakeholder management plan to properly identify and manage stakeholder engagement.	Stakeholder management plan will identify strategies and actions to promote productive stakeholder involvement.

4. RESULTS

This chapter speaks to the ten knowledge areas in project managent. Each knowledge area is explored within the context of the FGP as the project management plans are developed and integrated in the project. These management plans all aim for the successful completion of the CICSS project.

4.1 INTEGRATION MANAGEMENT

The purpose of this Project Integration Management Plan is to provide a complete management document to be used on a daily basis by the project team and the beneficiaries of the project in the completion of project deliverables. The Project Integration Management Plan is a dynamic document which is subject to ongoing review due to changes to the contract, management practices, education best practices, local and regional standards, and internal review.

The result of the FGP is the PMP for the upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the CICSS in Saint Lucia. The plan incorporates the PMBOK© Guide's ten (10) project management knowledge areas. The content and proposed processes for each knowledge area cover four (4) project management process groups: initiating, planning, executing, and monitoring and controlling (PMI, 2017).

Project integration management includes the processes and activities to identify, define, combine, unify and coordinate the various processes and project management activities within the project management process groups, (PMI, 2017).

In order to develop a PMP for the CICSS project, it was imperative to develop a project integration management plan that includes characteristics of unification, consolidation, communication and interrelationships. Project integration management is one (1) of the most important knowledge areas because it coordinates the other nine (9) knowledge areas and all of the project management processes throughout the project's lifecycle. Thus, the nine (9) other subsidiary plans form part of the PMP and, as such, are part of the integration process to form one (1) comprehensive PMP. Integration management ensures a holistic and well-informed approach to strategizing and executing a project.

To implement a successful CICSS project integration management plan, the following processes, as outlined in the PMI (2017), will be undertaken:

- Develop a project charter to formally authorize the existence of a project and provide the project manager with the authority to apply organizational resources to project activities;
- Develop a PMP which specifies the project scope statement, deliverables, timelines, milestones, and metrics to evaluate success;
    - Direct and manage project work in which the project manager takes charge of the day-to-day that must be done such as directing the project team; holding stakeholders meeting and tracking project progress;
- Manage project knowledge to use existing knowledge and create new knowledge to achieve the project’s objectives, and contribute to organizational learning;

- Monitor and control project to track and review work, and report on overall progress to meet the performance objectives defined in the PMP;
- Perform integrated change control to review all change requests; approve and manage changes to deliverables, organizational process assets, project documents and the PMP; and communicate said decisions; and
- Close project or phase to finalize all activities for the project, phase or contract.

Saviom (2021), states that project integration management is a component of project management that ensures all processes within a project run efficiently, and resources stay on track to achieve their targeted goal. Project integration management includes the processes and activities to identify, define, combine, unify and coordinate different processes and activities with project management process groups (PMI, 2017).

The CICSS project will also be dependent on the project manager's ability to schedule tasks and allocate resources to multiple teams from different departments and manage the deliverables for various project activities. The adoption of project integration management processes will ensure consistency between project deliverables. The project schedule may be impacted by a shift in the project scope, so it is important to track the project scope, resources and Budget.

The change control process will be outlined for all change requests. Status review meetings provide a catalyst or at least an opportunity for change. When an idea is introduced by a project stakeholder that would change or expand the scope of the project.

Regardless of whether this change increases or decreases the project's value to the organization, the project must have controls in place to manage change.

It should be noted that overall change controls must:

- ensure that a process is in place to evaluate the value of a proposed change;
- determine whether an accepted change has been implemented;
- include procedures for handling emergencies—that is, automatic approval for defined situations; and
- help the project manager manage change so that change does not disrupt the focus or work of the project team.

Figure 21 below outlines the change control process to be utilized in this process. Within the NTRC, a department will oversee the change control process and act as the Change Control Board. The project manager is responsible to for oversight of the project team and overall project progress. Changes in project work can be determined and recommended by any project team member. A formal change request must be prepared and submitted to the project manager. The project manager will be responsible for reviewing the change request and deciding if it should be presented to the project sponsor. The project manager will be responsible for updating the team with the outcome(s) of the change requests.

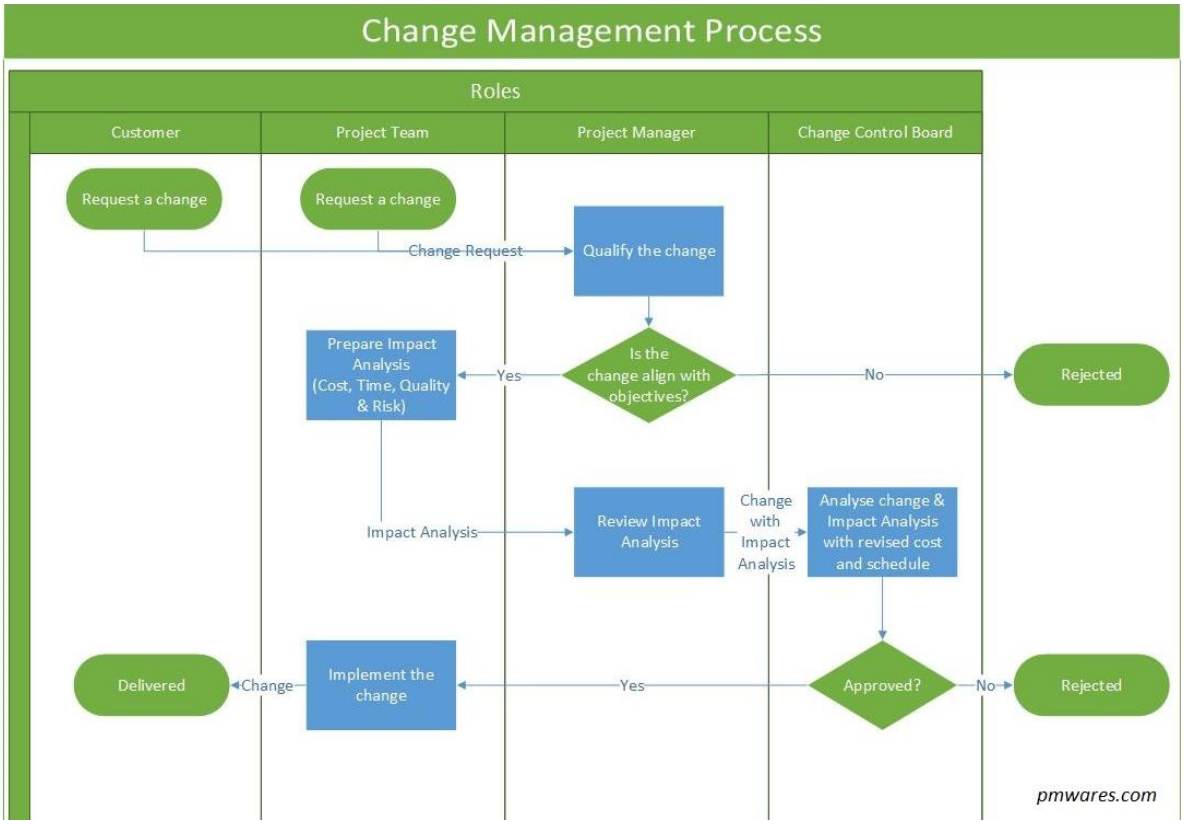


Figure 21: Change Control Process

(Source: https://www.pmwares.com/wp-content/uploads/2016/07/Change-Management-Process.jpg)

4.1.1 INTEGRATION MANAGEMENT PLAN

The PMP consists of the ten (10) subsidiary management plans detailed in this chapter. The project charter is the first process in the project integration management knowledge area. The project charter was developed using notes from discussions, articles, principal reports, focus group meetings, collecting data from the various technology laboratories and the PMBOK® Guide. The project charter formally authorizes the project and provides the project manager with the authority to apply organisational resources to the project to produce the PMP.

The project charter for the upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the CICSS in Saint Lucia was elaborated using a template provided via the UCI platform.

4.1.2 CHARTER OF THE PROPOSED FGP

Project Charter

1. General Project Information	
Project Name	Project Management Plan for the upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia.
Project Sponsor	National Telecommunications Regulatory Commission
Project Start Date	July 18, 2022
Project End Date	January 13, 2023
Knowledge Areas/Processes	**Application Area (Sector/Activity)**
• Project Integration Management • Project Scope Management • Project Schedule Management • Project Cost Management	Education, technology, information and communication technology

• Project Quality Management • Project Resource Management • Project Communications Management • Project Risk Management • Project Procurement Management • Project Stakeholder Management • Initiating, Planning, Monitoring and Controlling	

2. Project Team

	Name	**Area of Responsibility**	**Telephone**	**Email**
Project Manager	Yasmin Tyson	Project Management	758 452 5367	ytyson@ciceron.edu.lc
Team Members				
	Sandra Jones	Financial Manager	758 458 2035	sjones@ectel.int
	MOE IT Manager	Procurement/ Technology Specialist	758 721 7815	jvernor@education.gov.lc
	Adey Paul	Beneficiary	758 451 9242	apaul@ciceron.edu.lc
	Gilda Marcion	Quality Assurance	758 452 5367	gmarcion@ciceron.edu.lc

	Sue Paul	Academic Liaison	758 452 5367	spaul@ciceron.edu.lc
	Lisa Joseph	TVET Coordinator	758 452 5367	ljoseph@ciceron.edu.lc

3. Project Objectives (general and specific)

General Objective:

To develop a Project Management Plan to upgrade existing technological infrastructure, technologies, improve academics, and the attendance and morale of the staff and students of the Ciceron Secondary School in Saint Lucia.

Specific Objectives:

1. To develop and implement management processes according to PMI standards to plan, manage, control, and monitor project activities and deliverables.
2. To upgrade the technological infrastructure at the Ciceron Secondary School.
3. To provide access to students, staff and administration to functioning infrastructure and technological resources at the Ciceron Secondary School.
4. To establish a management hierarchy for the sustainability and monitoring of technology use throughout the Ciceron Secondary School in St. Lucia.
5. To improve the academic performance of students at the Ciceron Secondary School in St. Lucia by at least 30% within the next six months.
6. To provide 100% internet access in all classrooms and laboratories at the Ciceron Secondary School.
7. Implement cross department collaboration through the creation of department plans for sustainability purposes at the Ciceron Secondary School.

8. To create platform for knowledge sharing, processing and integration of data across subject disciplines at the Ciceron Secondary School.
9. To facilitate the hybrid instructional processes at the Ciceron Secondary School.

Project Purpose or Justification

In 2003, the Ciceron Secondary School was the beacon for technology integration education and technological resources in Saint Lucia. It boasted state of the art technology infrastructure, resources and the good academic results, both in academics and vocational subject areas. Over the years, through the neglect of Ministry of Education, Innovation, Gender Relations and Sustainable Development, the infrastructure, resources, student performance and teacher morale have all been hampered and the academic results substantiate this claim. The school moved from a CSEC level percentage pass rate of 85.77% in 2010 to 55.02% in 2022, a 30.75% decline. This along with limited participation in national competitions and extra-curricular activities signaled the need for an urgent intervention.

The lack of technological resources and infrastructure has, in part, accounted for poor student academic performance, low student attendance, declining staff morale and a dormant school environment. This is evident in the stock piled non-functioning computers and other resources, limited WiFi and internet access in classrooms and laboratories. This makes the delivery, execution and completion of classes a challenge. With limited or no technological resources or infrastructure effective learning and participation cannot take place.

The School's student cohort is predominantly from low to middle income families and, so requesting students to get their own technological resources has proved difficult. Attempts to provide students with internet access in the classroom have proven futile as the signal does not get beyond the doorway due to the institution's poor infrastructural layout. It is against this

backdrop that the researcher believes that the Ciceron Secondary School is in need of technological resources and an infrastructure upgrade to meet the demands of an ever-changing curriculum within the STEM framework.

4. **Project Scope Statement:**

To create a technology infused teaching-learning environment through the development of a project management plan for the upgrading of existing technological infrastructure, technologies, improve student academic performance, student attendance and morale of the staff and students of the Ciceron Secondary School in Saint Lucia.

5. Deliverables:

The CICSS physical and human resource Project will consist of the following deliverables aligned with the project's specific objectives:

1. The Project Charter and ten subsidiary management plans.
2. Upgraded ICT resources for staff and students.
3. Training in sustainable practices involving maintenance, operations and integration of technology at the Ciceron Secondary School.
4. Improved internet access and bandwidth throughout the Ciceron Secondary School.

6. Project Milestones

Milestones	Start date	End Date
Final Graduation Deliverables	July 18, 2022	August 12, 2022
Charter	July 18, 2022	July 22, 2022
Work Breakdown Structure	July 18, 2022	July 22, 2022
Chapter I Introduction	July 25, 2022	July 29, 2022
Chapter II: Theoretical Framework	August 1, 2022	August 5, 2022
Chapter III: Methodological Framework	August 8, 2022	August 12, 2022
Annexes	July 25, 2022	August 12, 2022
Graduation Seminar Approval	August 15, 2022	August 19, 2022
Appointment of Tutor	August 22, 2022	August 24, 2022
Adjustments of previous chapter (if needed)	August 25, 2022	August 31, 2022
Chapter IV Development (Results)	September 1, 2022	November 4, 2022
Integration Management Plan	September 1, 2022	September 7, 2022
Scope Management Plan	September 8, 2022	September 14, 2022
Schedule Management Plan	September 15, 2022	September 21, 2022
Cost Management Plan	September 22, 2022	September 28, 2022
Quality Management Plan	September 29, 2022	October 5, 2022
Resource Management Plan	October 6, 2022	October 12, 2022
Communications Management Plan	October 13, 2022	October 19, 2022
Risk Management Plan	October 20, 2022	October 26, 2022
Procurement Management Plan	October 27, 2022	November 2, 2022

Stakeholder Management Plan	November 3, 2022	November 9, 2022
Chapter V: Conclusion	November 10, 2022	November 17, 2022
Chapter VI. Recommendations	November 18, 2022	November 25, 2022
Reviewers Assignment Request	November 21, 2022	November 25, 2022
Assignment of two Reviewers	November 21, 2022	November 22, 2022
Communication	November 23, 2022	November 24, 2022
Submission to Reviewers	November 25, 2022	November 25, 2022
Reviews work	November 28, 2022	December 9, 2022
Reviewer	November 28, 2022	December 9, 2022
Report for reviewers	December 12, 2022	December 22, 2022
FGP update	December 23, 2022	December 23, 2022
Second review by reviewers	December 26, 2022	January 6, 2023
Final Review by Board	January 9, 2023	January 10, 2023
FGP Grade Report	January 11, 2023	January 13, 2023

7. Project Stakeholders

- Students
- School administration
- Teachers
- Funding agency
- Ministry of Education, Sustain Development, Innovation, Science, Technical and Vocational Training
- Parents

8. Resource Requirements:

- ICT experts
- Computer
- Training materials
- Printer

9. Assumptions:

- The Ministry of Education, Innovation, Gender Relations and Sustainable Development will provide the necessary support for this project.
- The National Telecommunications Regulatory Commission will provide full sponsorship for this project.
- The estimated resources will be adequate to complete the project.
- There will be a high level of stakeholder engagement to make the project a success.
- The project scope and requirements will have little to no changes.

10. Constraints:

- Time management is important as the project manager works fulltime and the period of July to December 2022 is usually a very intense working period for her.
- There are some challenges with stakeholders understanding of project expectations, instructions and documentation based on perceived language barriers, unclear and seemingly contradictory guidance and material.
- There may be an insufficient timeframe in which to complete the project.
- There are possibilities of gold plating and scope creep as a result of requests by school administrators.

11. Risks:

- If there is another global outbreak of another virus, e.g., COVID-19, Monkey Pox, Foot and Mouth disease or Polio, the poor health of key stakeholders can prevent the project management plan from being completed on schedule.
- If there is a hurricane or any other severe weather outbreaks, it may significantly impact the project schedule and may delay the intended start and end dates.
- If there is poor participation by key stakeholders in data collection efforts, then the information needed to make informed decisions will be inaccurate and significantly hamper the project.
- If there is ineffective and untimely communication between stakeholders, there may be increased instances of project delays, misunderstandings and leading to loss of data or misinformation and eventual project disruption.

12. Financials:

The expected expenses for the development of the CICSS Project Management Plan is USD$1,000,000.00.

13. Summary of Changes:

Revision	Date approved	Description of changes

14. Approval Signatures:

Project Manager: Yasmin Tyson	**Signature:** 

Authorized by: Carlos Brenes Mena	**Signature:** 

4.2 SCOPE MANAGEMENT PLAN

Scope management plan for the upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia.

Project Identification Number:

Project Prepared by: Yasmin A. Tyson, Project Manager

Document Version:

Chart 6: Document Version

(Source: Author of the study)

REVISION	DESCRIPTION OF CHANGE	AUTHOR	EFFECTIVE DATE
v1	Initial document upload to UCI learning management platform	Project Manager	09/25/22

Approved by Project Sponsor:

Approved by Beneficiary:

Date:

Table of Contents

4.2.0 INTRODUCTION

Project scope management includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully (PMI, 2017). As such, the scope management plan is an integral part of all projects. Asana (2021), notes that the purpose of a scope management plan is to create project structure by documenting the resources required to achieve the project objectives. PMI (2017), states that the scope management plan describes how the scope will be defined, developed, monitored, controlled and validated.

The development of the scope management plan and the detailing of the project scope begin with the analysis of information contained in the project charter, the latest approved subsidiary plans of the PMP, historical information contained in the organizational process assets and any other relevant enterprise environmental factors (PMI, 2017).

4.2.1 SCOPE MANAGEMENT APPROACH

The project manager is responsible for the execution of the scope management plan and the scope statement, work breakdown structure and WBS dictionary define the scope of this project. The project manager, sponsor and the Project Management Committee are responsible for establishing and approving the documentation for measuring the project scope. They are also responsible for initiating changes to the project scope.

The project manager is required to review and evaluate all scope changes initiated by the project team. Once the scope change is accepted, the project manager will submit the change request to the Project Management Committee for approval. Following its approval, the Chair of Project Management Committee will submit the scope change request, with its written justification, to the sponsor for approval.

On the other hand, the project manager, Project Management Committee and Technology Consultant are responsible for approving operational and technical scope changes. The Project Management Committee and the sponsor are responsible for approving scope changes that affect the schedule and cost.

Following the project manager's approval of all scope changes, the Project Management Committee, and the sponsor, the project team will update all project documents, and communicate the scope changes to all stakeholders. The project sponsor and the Project Management Committee are responsible for the approval of the completed project deliverables.

4.2.2 ROLES AND RESPONSIBILITIES

Chart 7: Requirements Roles and Responsibilities Matrix

(Source: Author of the study)

Scope Management Roles and Responsibilities		
Name	**Roles**	**Responsibilities**
Yasmin Tyson	Project Manager	• Measure and verify project scope • Assess scope change requests • Make recommendations for scope change requests to the Project Management Committee • Organize and convene change control meetings, and communicate the outcomes of scope change requests • Update the project documents upon approval of all scope changes Monitors project performance • Monitor project risk and implement risk responses measures. • Receive information from and report to the Project Committee members
National Telecommunications Regulatory Commission	Project Sponsor	• Provide project finances • Provide policy direction throughout the execution of the project • Provide final approval of project deliverables

Scope Management Roles and Responsibilities		
		• Approve or deny scope change requests • Review and evaluate scope change requests • Approve and provide additional project funds based on changes to scope and cost • Approve or deny scope change requests • Evaluate the need for scope change requests • Accept project deliverables
MOE IT Manager	Technology Consultant	• Communicate directly with the sponsor • Provide overall guidance on the monitoring of the project • Review, evaluate and make recommendations on projects scope baseline • Review, evaluate and recommend scope changes to the sponsor for approval • Resolve project implementation issues escalated by the project manager • Provide technical and functional direction to the project manager and team • Review and approve scope changes
School Administrative	Project Management	• Provide guidance to the project manager • Recommend scope changes to the project

Scope Management Roles and Responsibilities		
Team	Committee members	manager • Escalate technical and functional issues to the project manager • Participate in scope changes meeting • Participate in meetings with the project manager on issues relating to the project scope • Communicate scope changes to stakeholders • Receive feedback from stakeholders
Stakeholders	Beneficiary	• Participate in meetings to define project requirements • Recommend project changes to the project manager and team • Escalate, as appropriate, project implementation challenges to the project manager and team
Ministry of Education, Sustainable Development, Innovation, Science, Technical and	Beneficiary	• Provide project implementation guidance and support • Participate in meetings of the Project Committee • Receive and approve reports on project implementation • Communicate with project manager on project

Scope Management Roles and Responsibilities		
Vocational Training		implementation
Heads of Department	Project sub-committee members	• Monitor the curriculum for their various departments to integrate the use of technology and technology tools • Oversee the technology integration process • Liaise with teachers and students • Provide guidelines for teachers • Follow the project schedule so that the completion deadline is not missed • Give progress reports and communicate any difficulties they encounter to the project committee

4.2.3 SCOPE DEFINITION

The scope for the upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the CICSS in Saint Lucia was defined through a comprehensive requirements collection process. Firstly, a thorough inventory and analysis was performed based on the availability of resources, staff perceptions and student feedback. Based on this information, the project team developed the project requirements documentation, the requirements management plan and the

requirements traceability matrix of what the upgrade of existing technological infrastructure, resources and the provision of technological support training must resemble.

4.2.4 PROJECT SCOPE STATEMENT

The scope statement is where you will identify the work that needs to be done in order to complete the project. It defines your objectives and directs the processes for completing the project (Global Knowledge, 2020). The upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia includes improved internet access to students and staff; replaced and upgraded technological devices and infrastructure, technological support from the MOE; and staff training in the use of the upgraded technological resources and infrastructure.

4.2.4.1 PROJECT SCOPE DESCRIPTION

The project will achieve the following deliverables:

- Development and upgrade of infrastructure at the CICSS
- Upgrade of internet access at the CICSS
- Provision of ICT tools and technology for staff and students at CICSS
- Provision of training opportunities for staff and students of CICSS
- Technology support for staff and students at CICSS
- Maintenance and security for technological infrastructure, devices and ICT tools at the CICSS

4.2.5 PROJECT BENEFITS

The following benefits will be realized as a result of the scope management plan:

- Increasing the probability of achieving the desired objectives and project success;
- Fostering stakeholder confidence as a formal document or best practice in the project world;
- Serving as a reference point for similar projects;
- Establishing effective communication among stakeholders;
- Promoting monitoring and control procedures during and after the project; and
- Creating a systematic approach for the coordination of key processes and activities.

If executed successfully this PMP can:

- Upgrade the infrastructure and ICT integration in various subject disciplines;
- Improve the teaching learning environment;
- Improve student and teacher access to technological tools and resources;
- Improve student academic performance;
- Reduce the amount of paper being used especially at examination time;
- Boost teacher morale; and
- Increase student chances of employability.

4.2.6 PROJECT ACCEPTANCE CRITERIA

This project will be accepted once the upgrade of existing technological infrastructure, resources is accomplished and technological support training for the staff

and students has been successfully implemented, tested and shown to be functional and compatible with the current technological infrastructure and curriculum at the CICSS.

4.2.7 PROJECT DELIVERABLES

The project will achieve the following deliverables:

- Integration management Plan;
- Scope Management Plan;
- Schedule Management Plan;
- Cost Management Plan;
- Quality Management Plan;
- Resource Management Plan;
- Communication Management Plan;
- Risk Management Plan; and
- Procurement Management Plan.

4.2.8 PROJECT EXCLUSIONS

This project does not include the following:

- Development of an ICT integration policy; and
- After school program supervision.

4.2.9 KEY PERFORMANCE INDICATORS

According to Twin (2022), key performance indicators (KPIs) refer to a set of quantifiable measurements used to gauge a company's overall long-term performance. More specifically, Scoro (2022), notes that project KPIs are measurable indicators that help

to track a project's performance. To ensure that projects get completed on time, project managers need to monitor and understand their team's work process and lead the project towards long-term goals.

Chart 8: Key Performance Indicators

(Source: Author of study)

Key Performance Areas	Success Criteria	KPI	Timeline	How is it going to be measured	How often to measure
Access to the internet within classrooms	Students and staff are able to access the internet in laboratories and classrooms	100% classrooms and laboratories have internet access.	6 months	Observational Checklist	Fortnightly
Infrastructure and resources development upgrade	Functioning infrastructure and resources development at 95% capacity.	95% of hardware and software upgraded or replaced to ensure maximum Implementation	6 months	Inventory and technician reports	Monthly and/or termly

Key Performance Areas	Success Criteria	KPI	Timeline	How is it going to be measured	How often to measure
		efficiency			
Online examinations	Increase in online examinations	50% of the students are provided with practice in online examinations	6 months	Teacher PLC reports and statistics from learning management platforms	Monthly and termly
Maintenance plan	Routine maintenance of hardware	IT Technician is on plant by October 2022	6 months	Technician's report	Monthly
Staff engagement	Increase use of ICT hardware and software in the planning, preparation and delivery of lessons.	100% of the staff use technology in their day-to-day operations at the school.	6 months	Survey results	Monthly
Trained teachers	Greater number of	100% of the teachers are	6 months	Results of staff survey	Termly

Key Performance Areas	Success Criteria	KPI	Timeline	How is it going to be measured	How often to measure
	teachers trained in the use of and integration of ICT tools and resources in their lessons.	trained in the use of ICT tools and resources in their lessons.			

4.2.10 WORK BREAKDOWN STRUCTURE

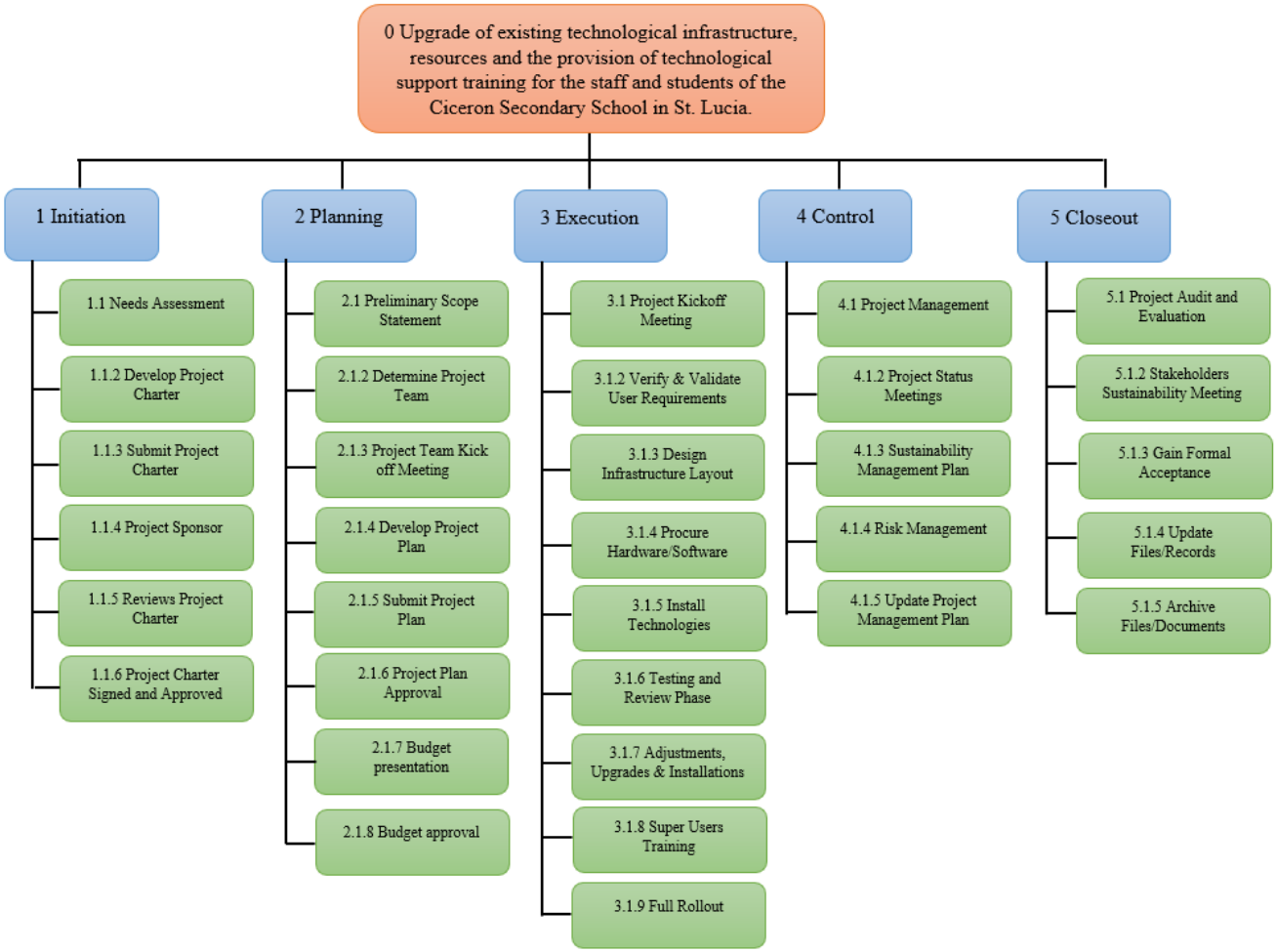


Figure 22: FGP WBS

(Source: Author of Study)

4.2.11 WBS DICTIONARY

Chart 9: WBS Dictionary

(Source: Author of study)

WBS Dictionary						
Project Title: A Project Management Plan for the upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia.						
Project Identification Number:						
WBS Code	**Component Name**	**Description of work**	**Assumptions and constraints**	**Responsible organization**	**Deliverables**	**Acceptance criteria**
1	Initiation	Brainstorming and preparation of project documents that will assist in presenting a viable case for the approval of	Stakeholders come together to decide on project and prepare the business case. Limited stakeholder	CICSS	Business case	Completed business case giving the ‘go’ ahead for the project.

		the project.	involvement.			
1.1	Needs Assessment	Identification of the critical areas that needs to be addressed to attain the positive outcome that is desired by stakeholders.	Stakeholders are able to clearly identify crucial areas that require immediate attention by the project. Needs identified are those of a select few and will not significantly impact the project.	CICSS	Needs Assessment Report SWOT analysis	Thorough report of the technological and ICT needs of the staff and students of the Ciceron Secondary School.
1.1.2	Project	Develop project	All information	CICSS	Project Charter	Completed

	Charter	charter	will be easily acceptable for the compilation of the project charter with clearly defined objectives. Project charter does not address the problems of the stakeholders.			project charter
1.1.3	Submit Project Charter	Review of all project documents by the project	Project charter reflects needs and objective the project.	CICSS	Updated and final project charter	Project Charter approved and circulated

		manager and project team.	Project charter may not be submitted as a result of stakeholder conflict.			
1.1.4	Project Sponsor	Review of all project documents by the project manager and project team for submission to the sponsor	Project sponsor accepts project charter and views this project as a viable one. Project sponsor not identified and no	MOE CICSS	Sponsor identified	Sponsor commits to provide funding for this project.

			funding is forthcoming.			
1.1.5	Reviews Project Charter	Review of comments and feedback by sponsor on the project documents	All project updates are accepted by all stakeholders. Sponsor withdraws due to inability of stakeholders to reach a compromise.	MOE CICSS	Sponsor and stakeholder satisfaction realized	Adjustments requested by the sponsor are acceptable to project team and stakeholders.
1.1.6	Project Charter Signed and Approved	Submission of updated project documents to sponsor	Sponsor satisfied with changes and adjustments and ready to finalize	MOE CICSS	Sponsor finalized and contracts signed	Approved and signed document

			contracts. Sponsor unable to access all funds required for the project.			
2	Planning	Project manager and project team begin intense planning and preparations.	Collaboration among stakeholders facilitates planning and preparation measures. Insufficient details available to	CICSS MOE	Project reports and minutes of meetings	Comprehensive project plan

			commence planning stages			
2.1	Preliminary Scope Statement	Project scope developed based on the Project Charter		CICSS	Scope statement	Draft scope statement
2.1.2	Determine Project Team	Identify team members with the skillset to effectively contribute to the successful completion of the project.	Project team is available for entire project lifecycle. COVID-19 cases still being reported.	CICSS	Names of project team members	Established project team
2.1.3	Project Team Kick off	Meeting to set ground rules,	Team members avail themselves	CICSS	Report and minutes of the	All project team members attend

	Meeting	roles and responsibilities for project team.	for meeting. Schedule compatibility	MOE NTRC	meeting	meeting and make meaningful contributions.
2.1.4	Develop PMP	Project team formulates plan.	Data collected accurately for PMP development. Insufficient data to complete PMP in a timely manner.	CICSS MOE	PMP	Data collected and available for timely PMP completion.
2.1.5	Submit PMP	Finalize and submit project plan.	Active participation and availability by MOE.	Ciceron Secondary School	PMP submitted	Supported submission of PMP

			Isolated project by CICSS with no MOE assistance.	MOE		
2.1.6	PMP Approval	PMP accepted by stakeholders.	Plans only require final review and approval. Indecisiveness among stakeholders.	CICSS	PMP	Approved PMP
2.1.7	Budget presentation	Project manager presents budget for project.	Cost of supplies unchanged. Close supervision	CICSS NTRC	Preliminary budget	Draft project documents developed and approved by

			required.			project team
2.1.8	Budget approval	Budget approved by sponsors and project team.	Budget is in keeping with stakeholder's expectations and is approved. Budget rejected due to high costs of resources.	NTRC CICSS	Project budget	Project budget approved and circulated
3	Execution	Design and develop PMP	Plans only require final review and approval. Data not readily	NTRC CICSS	PMP	Completed PMP

			available to complete plans.			
3.1	Project Kickoff Meeting	Engage project team to commence the execution of the project.	Team members avail themselves for meeting. Schedule compatibility	CICSS MOE	Minutes and reports	All project team members attend meeting and make meaningful contributions.
3.1.2	Verify and Validate Project Scope	Project team and stakeholders ‘collaboration to verify and validate scope	All requirements of the project have been met according to the project plan. Project sponsor is	CICSS MOE	Project scope	Signed project deliverable acceptance document

			still uncertain about various aspects of the project.			
3.1.3	Design Infrastructure Layout	Prepare infrastructural layout and design	Designs are compatible with existing infrastructure. Existing infrastructure are inadequate and cannot support designs.	MOE	Network diagram	Compatible network diagram and infrastructure layout
3.1.4	Procure	Implement	Material and	NTRC	Report	Delivery of

	Hardware and Software	procurement strategy and process for the hiring of a consultant	supplies available and within budget. Heavy supervision required as a result of gold plating.		procurement process and actions	procured resources
3.1.5	Install Technologies	Implement process and checklists for the installations	No delays due to human resource challenges. Availability of technology experts.	MOE	Checklist	Successful installation of technologies
3.1.6	Testing and Review	Execute plans for operations of	Skilled and experienced	CICSS	Operating guidelines	Successful implementation

	Phase	technologies	workers available for this phase. Lack of product knowledge	MOE	Check List	
3.1.7	Adjustments, Upgrades and Installations	Adjustments and upgrades to ensure optimum performance.	Upgrades and adjustments are made to resources to ensure compatibility. IT technician not readily available to make the necessary	CICSS MOE	Reports and checklist	Functional installations

			upgrades and adjustments to resources.			
3.1.8	Super Users Training	Practical training and workshops conducted for Heads of Department and administration	Training plans and materials are well received by participants. Training materials are above the level of participants and, therefore, the technology integration practices are not	CICSS MOE NTRC	Training manual and guidelines	Training guidelines

			fully understood.			
3.1.9	Full Rollout	Dissemination, installation and operation of all hardware, software and ICT tools.	Project is able to be fully implemented by the project team. Gold plating is causing delays in the project implementation.	CICSS MOE NTRC	Reports, checklist and guidelines	Project implementation plan full roll out.
4	Control	Presentation of reports and document concerning audits,	Skilled and experienced experts conduct audits and quality management	CICSS MOE NTRC	Evaluation and observation checklists	Results of audits and checklists

		evaluations and amendments.	checks. Insufficient documentation for audits			
4.1	Project Management	All project management documents updated	PMP are developed and implemented. Project management areas not adequately addressed by the project team.	CICSS MOE NTRC	PMP	Project management documents and plans
4.1.2	Project Status	Updates and	Meetings are	CICSS	Reports and	Project status

	Meetings	rectifications of issues	conducted in a timely manner and addresses all project areas. No status reports are available due to poor documentation.	MOE NTRC	minutes	reports
4.1.3	Sustainable Scope Management Plan	Guidelines and processes for sustainable development	Areas of sustainability are easily identified and implemented.	CICSS MOE NTRC	Sustainable scope management plan	Sustainability measures used in scope management plan

			Sustainability measures are not easily integrated into the project.			
4.1.4	Risk Management	Project documents for the execution and implementation of the project developed	Project team is able to identify, mitigate and avoid risks. Not all risks are identified and no response measures put in place.	CICSS MOE NTRC	Risk management plan	Comprehensive risk management plan
4.1.5	Update PMP	Adjustments to project	PMP updated in a timely manner.	CICSS	Reviewed and updated PMP	Updated PMP

		documents	No adjustments made to PMP due to poor record keeping and documentation.	MOE NTRC		
5	Closeout	Handing over deliverables to the beneficiary, closing supplier contracts, releasing staff and equipment, and informing stakeholders of	Data collected accurately. Reduced availability of data after project completion.	CICSS MOE NTRC	Project closure report	Complete project closure report

		the closure of the project				
5.1	Project Audit and Evaluation	Work Related to closing the project. Final evaluations	Audit conducted in a timely manner. Evaluation of project incomplete due to poor documentation.	CICSS MOE NTRC	Audit report	Completed audit
5.1.2	Stakeholders Sustainability Meeting	Review project impact and implementation	Sustainable practices are embraced by stakeholders. Limited time	CICSS MOE NTRC	Stakeholder management plan	Implemented stakeholder management plan

			factor and scheduling challenges.			
5.1.3	Gain Formal Acceptance	Handing over deliverables to the beneficiary, closing supplier contracts, releasing staff and equipment, and informing stakeholders of the closure of the project	All contracts are fulfilled and stakeholder satisfaction is high. Delays in the closing of project	CICSS MOE NTRC	Reviewed and updated project documents	Acceptance of deliverables and project closure reports
5.1.4	Update Files	Adjustments to	Change request	CICSS	Reviewed and	All project

	and Records	reports and lessons learnt register	documents are tracked and updated. Inaccurate reports and recording of information.	MOE NTRC	updated project documents and lessons learnt	documents updated
5.1.5	Archive Files and Documents	Work related to closing the project	All project deliverables and outcome completed. Scope creep and gold plating cause delays in the	CICSS MOE NTRC	Lessons learnt Lessons updated Contract Closing Letter	Successful project completion stakeholder satisfaction met.

			project completion according to schedule.			

4.2.12 SCOPE VERIFICATION

As the PMP for the upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the CICSS in Saint Lucia progresses, the project manager will verify interim project deliverables against the original scope as defined in the scope statement, WBS and WBS Dictionary. Once the project manager verifies that the scope meets the requirements defined in the project plan, the project manager and sponsor will meet for formal acceptance of the deliverable.

During this meeting the project manager will present the deliverable to the project sponsor for formal acceptance. The project sponsor will accept the deliverable by signing a project deliverable acceptance document. This will ensure that project work remains within the scope of the project on a consistent basis throughout the life of the project.

4.2.13 SCOPE CONTROL

The project manager and the project team will work together to control the scope of the CICSS project. The project team will leverage the WBS dictionary by using it as a statement of work for each WBS element. The project team will ensure that they perform only the work described in the WBS dictionary and generate the defined deliverables for each WBS element. The project manager will oversee the project team and the progression of the project to ensure that this scope control process is followed and progress is reported through project scope measurements tools.

4.3 REQUIREMENTS MANAGEMENT PLAN

Table of Contents

4.3.0 INTRODUCTION

The purpose of the CICSS Requirements Management Plan is to establish a common understanding of how requirements will be identified, analyzed, documented, and managed for the CICSS project.

Requirements will be divided into two categories: project requirements and product requirements. Project requirements are the requirements identified to meet the needs of the project and ensure its completion and readiness to hand over to operations. These consist mostly of non-technical requirements. Product requirements are the requirements identified to meet the technical specifications of the product being produced as a result of the project: network reconfiguration and upgrade, computer hardware and software upgrades and ICT resources. These will consist of requirements to ensure that performance specifications are met and hardware specifications are properly documented.

The inputs for the requirements management plan include the CICSS Project Charter and Stakeholder Register.

4.3.1 DOCUMENT CONTROL INFORMATION

Chart 10: Document Control Information

(Source: Aurthor of study)

Document Title	Requirements Management Plan
Project Title	Project Management Plan for the upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia.
Document Author	Yasmin Arlet Tyson
Project Owner	Ciceron Secondary School
Project Manager	Yasmin Arlet Tyson
Document Version	Version 1
Date	

Document Approver(s)

Name	Role	Action	Date
		(approve/review)	

4.3.2 VERSION CONTROL

Harrin (2022), states that document version control is the process of tracking and managing different versions (or drafts) of a document so you know which is the current iteration of a file. By incorporating the document version control into this project, it further supports the documentation process and ensures that all project team members are on track

and information is readily available and traced throughout the project. All project documentation will be loaded into the NTRC Database as the central repository for the CICSS Project. Appropriate permissions will be granted to the project team for editing and revising documentation. Once these proposed changes are approved and the documentation is edited, the project manager will be responsible for communicating the change to all project stakeholders.

Chart 11: Document Version Control

(Source: Author of study)

Version	Date	Author	Rationale	Approval date and Signature
0.1	September 25, 2022	Yasmin Tyson	First Draft	

4.3.3 REQUIREMENTS MANAGEMENT PROCESS

Requirements management is the process of documenting, analyzing, tracing, prioritizing and validating project requirements (Scavetta, 2022). Therefore, developing a process for managing requirements creates consistency and transparency. Barenscheer (2022), summarized the following by stating that project requirements are one of the most important aspects of project management, a requirements management plan is a key document that helps to ensure that project requirements are gathered and managed effectively.

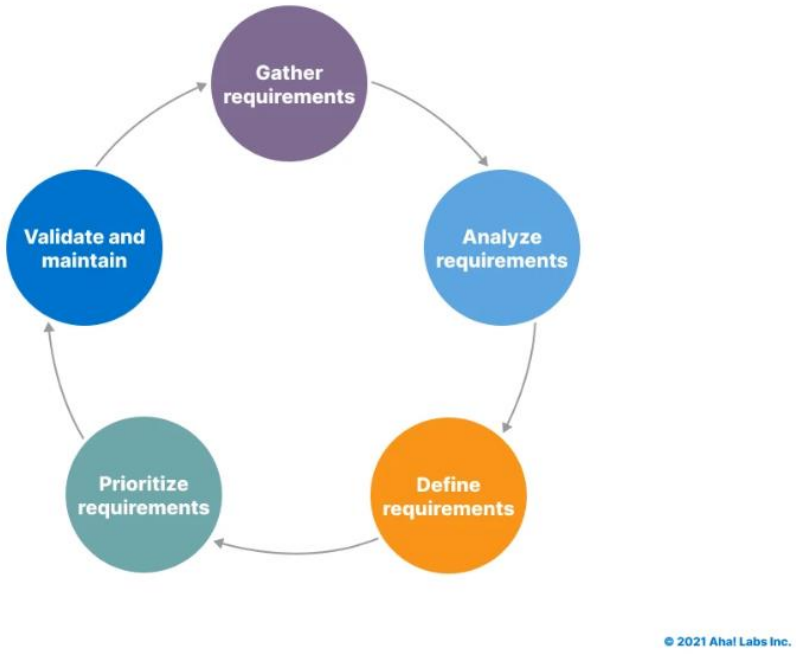


Figure 23: Requirements process lifecycle in an Agile environment

(Source: https://www.lucidchart.com/blog/is-agile-waterfall-hybrid-right-for-your-team)

The CICSS project represents a hybrid approach in that some activities and tasks may follow a linear process whereas others follow a phased cyclical process as shown in the Figure 23 above.

4.3.4 REQUIREMENTS, TOOLS AND TECHNIQUES

The following techniques will be used for requirements management herein, namely, interviews, brainstorming, workshops, observation, surveys, checklists and focus group discussions. Notwithstanding, the requirements traceability matrix is the main technique used in this plan.

4.3.5 REQUIREMENTS MANAGEMENT LIFECYCLE

Nicholas (2022), states that the requirements lifecycle management is the knowledge area that describes the tasks that a project manager performs to manage and maintain requirements from initiation right through to final implementation. The process includes collect, identify, define, evaluate, prioritize, approve and trace the project requirements.

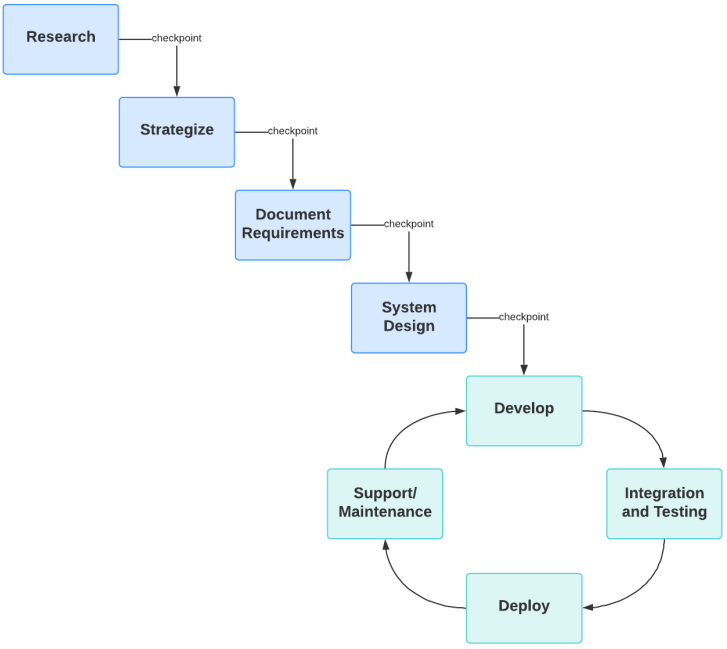


Figure 24: Agile-Waterfall Hybrid

(Source: https://www.lucidchart.com/blog/is-agile-waterfall-hybrid-right-for-your-team)

As defined by Bergmann and Hamilton (2019), the Agile-Waterfall hybrid model typically allows teams developing software to work within the Agile methodology, while hardware development teams and product managers normally stick to the Waterfall

approach. The CICSS project deals both with hardware and software improvements along with other technological resources, so a joint approach is necessary.

REQUIRMENTS IDENTIFICATION

The project requirements were obtained from project stakeholders using various data gathering tools, including interviews, focus groups, surveys, brainstorming, observational checklists and historical data.

REQUIREMENST EVALUATION

The project team will assess and classify each requirement to ensure synchronization, transparency and consistency with the overall project objectives, including the implementation costs. Moreover, the project manager will confirm that the requirements are within the project scope as defined in the project charter. The requirements that are out-of-scope would be logged in the requirements documentation. In the requirements traceability matrix, the acceptance criteria will identify the achievement of the project requirements.

REQUIREMENTS DOCUMENTATION

Requirements documentation in project management describes how each requirement meets the business needs for the project (PMI, 2017). The website goes further to state that requirements should be measurable, traceable, consistent, complete and acceptable to the stakeholders.

The requirements that are identified will be evaluated and documented in the project. The requirements will be added to the project plan where the project team will identify the appropriate methodology that will be used to monitor and report on each requirement.

Chart 12: Requirements Documentation Matrix

(Source: https://www.pm2alliance.eu/publications)

Requirements documentation	
Change Identification and Description	
ID	The unique requirement identifier. It should be numbered sequentially.
Name	Short name of the requirement.
Category	Categorizes the requirement, Functional Requirements, Technical Requirements, Training Requirements, Quality Requirements, Performance Requirements, Security requirement, Support Requirements, Maintenance Requirements, System quality requirement,
Type	Requirement type refers to the technique used to describe the requirement, for example: User story, Story board, Use Case, Report structure.
Requirement Description and Details	A description of the requirement in text or using picturizing techniques like use case diagrams, sketches.
Acceptance Criteria	One (1) or more acceptance criteria that allow the stakeholders to test if the deliverable meets the requirement.

Status	The status of a requirement can be any of the following: Specified, Proposed, Approved, Incorporated, Implemented, Validated, For Fixing and Rejected.
Requested by	The source of the requirement. The stakeholder(s) to whom the requirement is important.
Identification Date	The date that the requirements were brought up.

Chart 12 above, shows the structure of the requirements documentation to be used for identifying, documenting, evaluating, prioritizing, approving and validating requirements.

APPROVAL REQUIREMENTS

The sponsor, project team and project manager will come to a consensus on the requirements for the project and their prioritization. The project team must ensure that all the in-scope requirements can be achieved within the project cost and schedule. The formal approval of all requirements would be entered in the Decision Log and the minutes of meetings will be recorded.

MONITOR AND VALIDATE REQUIREMENTS

The project manager will be vigilant in monitoring the implementation of each requirement. The new requirements and changes will be dealt with via the formal change control process. Formal acceptance of the requirements for the project must be in alignment with the deliverables and the agreed upon acceptance criteria.

4.3.6 ROLES AND RESPONSIBILITIES

Chart 13: Requirements Roles and Responsibilities

(Source: https://www.pm2alliance.eu/publications)

Roles	Responsibilities
Project Owner (PO)	• Accountable for all requirements • Approving or rejecting requirement documentation • Approving requirements acceptance criteria • Approving the prioritization of requirements
Project Manager (PM)	• Managing, monitoring, controlling and reporting the status of the requirement documentation and processes • Identifying, documenting, evaluating, prioritizing, approving and validating requirements • Assign specific tasks to the project team, member or to another project stakeholder
Project Team (PT)	• Informed on the status of the requirements gathering and management processes • Support the PM in the requirements management related activities • A consultant may be a part of the project team
Consultants and Heads of Department	• Tailor and elaborate on the requirements documentation and the priorities • Identify the relevant staff to assist with the requirement(s)

Roles	Responsibilities
(HOD/C)	gathering process, e.g., participation in workshops and interviews • Identify the staff and students to participate in deliverable testing during deliverable acceptance
MOE	• Review requirements documentation • Recommend changes to project requirements and acceptance criteria
Project Sponsor (PS)	• Informed about the status of the requirements gathering process and on changes to the approved requirements documentation and priorities

A Responsible, Accountable, Supportive, Consulted, Informed (RASCI) matrix is a matrix, i.e., chart, model or framework, that is used to help identify all the roles and responsibilities of each stakeholder on a project. It clearly defines who is working on a specific subtask of a project (Brulotte, 2021).

The following RASCI table defines the responsibilities of those involved in requirements management on the CICSS project.

Chart 14: RASCI Table

(Source: https://www.pm2alliance.eu/publications)

RAM (RASCI)	**MOE**	**PS**	**PO**	**HOD/C**	**PM**	**PT**
Requirements Management Plan	S	I	A	C	R	S
Manage Requirements	I	I	A	C	R	S

4.3.7 REQUIREMENTS PRIORITIZATION

Requirements prioritization is the process of assembling requirements in ascending order of relative urgency and importance. Prioritizing requirements must be done in conjunction and collaboration with all the key stakeholders and the CICSS project being no exception. Chart 15 below displays the requirements prioritization for the project. Any approved changes will be updated in the requirements traceability matrix.

Chart 15: Requirements Prioritization

(Source: Author of study)

Priority Level	**Definition**
High	The requirements are critical and required for the project's success, performance and implementation to progress to the next level.
Medium	These requirements can be completed before the next project phase commences.
Low	These requirements are functional and are not critical to the success of the project.

The requirements traceability matrix is a grid that links product requirements from their origin to the deliverables that satisfy them (PMI, 2017).

4.3.8 REQUIREMENTS TRACEABILITY MATRIX

Chart 16: Requirements Traceability Matrix for Ciceron Secondary School Project

(Source: Adapted from PMI (2017))

REQUIREMENTS TRACEABILITY MATRIX							
PROJECT TITLE		A Project Management Plan for the upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia.					
ID	**Requirements Description**	**Project objectives**	**Project deliverable**	**Product development requirements**	**Priority**	**Verification**	**Status**
1.1	Conduct Needs Assessment	To determine needs of stakeholders	Needs Assessment Report	Funds to support project team	High	Stakeholder register Notes	
1.1.1	Develop	To create a	Project	Funds to	High	Completed	

REQUIREMENTS TRACEABILITY MATRIX							
	Project Charter	project charter	Charter	support project team		project charter document	
1.1.2	Submit Project Charter	To submit completed project charter	Updated and final project charter	Funds to support project team	High	Completed project charter document	
1.1.3	Source Project Sponsor	To identify and approach a project sponsor	Sponsor identified	Meeting with project sponsor	High	Completed project charter document	
1.1.4	Review Project Charter	To discuss and collect feedback from stakeholders	Updated project charter document	Funds for the project team Inputs from data gathering methods among	High	Updated project charter document Notes and minutes from	

REQUIREMENTS TRACEABILITY MATRIX							
				stakeholder		review meetings	
1.1.5	Approve and Sign Project Charter	To complete the development and approval processes of the project charter.	Sponsor finalized Contracts signed Sign off by all stakeholders on project charter	Funds for the project team Inputs from data gathering methods among stakeholder Official application forms required by the sponsor	High	Signed documents and contract	
2.1	Prepare	To commence	Scope	Funds for the	Medium	Completed	

REQUIREMENTS TRACEABILITY MATRIX							
	Preliminary Scope Statement	preparations of draft of scope statement.	statement	project team Inputs from data gathering methods among stakeholder		scope statement and notes of meetings and discussions	
2.1.1	Determine Project Team	To determine the composition and creation of the project team.	Names of project team members Roles and responsibilities of project team members	Funds for the project team Inputs from data gathering methods among stakeholder Project Team	Medium	Project team members along with roles and responsibilities.	

REQUIREMENTS TRACEABILITY MATRIX							
2.1.2	Conduct Project Team Kick off Meeting	To appoint team leaders. To introduce project team members. To present information on the project charter and timelines.	Report and minutes of the meeting	Funds for the project team Meeting templates Project Team	Medium	Meeting notes Minutes	
2.1.3	Develop PMP	To engage the project team	PMP	Funds for the project team	High	Notes from discussions	

REQUIREMENTS TRACEABILITY MATRIX							
		in the development of the PMP		Inputs from data gathering methods among stakeholder Historical data		and meetings Draft PMP	
2.1.4	Submit PMP	To complete and submit the PMP to stakeholders	PMP submitted	Funds for the project team Inputs from data gathering methods among stakeholder	High	Completed PMP Handover document	
2.1.5	Approve	To ensure	Approved	Funds for the	High	Approved	

REQUIREMENTS TRACEABILITY MATRIX							
	Project PMP	official documents are presented and within project scope.	Project document	project team Inputs from data gathering methods among stakeholder Official application forms required by the sponsor		project documents with relevant signatures Written approval from project owner and sponsor	
2.1.6	Present Budget	To outline all cost and expenditure within the project.	Preliminary budget	Funds for the project team Inputs from data gathering methods among	High	Notes from budget meeting Budget	

REQUIREMENTS TRACEABILITY MATRIX							
				stakeholder Official application forms required by the sponsor Project team			
2.1.7	Approve Budget	To finalize all budgetary requests and financial forecasts.	Project budget	Funds for the project team Inputs from data gathering methods among stakeholder	High	Written approval from sponsor	

REQUIREMENTS TRACEABILITY MATRIX							
				Application forms required by the sponsor			
3.1	Conduct Project Kickoff Meeting	To ensure allocations are assigned as outlined in the PMP	Minutes and reports	Funds for the project team Inputs from data gathering methods among stakeholder Application forms required by the sponsor	Medium	Notes Minutes	

REQUIREMENTS TRACEABILITY MATRIX							
				Project team			
3.1.1	Verify and Validate project scope	To ensure that the project stays on schedule. To avoid scope creep and gold plating.	Project scope	Funds for the project team Inputs from data gathering methods among stakeholder Approved project charter Project team	Medium	Project Reports	

REQUIREMENTS TRACEABILITY MATRIX							
				Project deliverables verified			
3.1.2	Design Infrastructure Layout	To ensure that the layout is compatible with the new resources being procured through the project.	Network diagram Electrical plan Data network plan	Finances for the procurement of IT/ICT consultant Procurement plan and strategy Qualification requirements for expert	High	Consultancy reports Acceptance of deliverables by the beneficiary Trained professionals as established by project	

REQUIREMENTS TRACEABILITY MATRIX							
				Assign a project team member		baselines	
3.1.3	Procure Hardware/Software	To ensure that the procurement of hardware and software meets the quality standards of the project.	Report procurement process and actions	Finances for the procurement of IT/ICT consultant Procurement plan and strategy Hardware and software specifications	High	Procurement report	

REQUIREMENTS TRACEABILITY MATRIX							
3.1.4	Install Technologies	To ensure that all technological resources are installed by an expert consultant.	Checklist	Finances for the procurement of IT/ICT consultant Warranty Hardware and software specifications	High	Consultant report Installation checklist/guide	
3.1.5	Commence Testing and Review Phase	To ensure that all installed resources are functional within its	Operating Guidelines	Finances for the procurement of IT/ICT consultant	High	Consultant report Installation checklist/guid	

REQUIREMENTS TRACEABILITY MATRIX							
		existing environment.		Warranty Hardware and software specifications		e Assessment reports	
3.1.6	Initiate Adjustments, Upgrades and Installations	To make the necessary modifications so that all resources are operational and performing optimally.	Reports and checklist	Finances for the procurement of IT/ICT consultant Qualification requirements of consultants Warranty	High	Consultant report Installation checklist/guide Assessment reports	

REQUIREMENTS TRACEABILITY MATRIX							
				Hardware and software specifications			
3.1.7	Train Super Users	To conduct training of all Heads of department using the newly acquired resources.	Training manual and guidelines	Designate project team members and or IT/ICT consultant Qualification requirements of consultants Training	Medium	Consultant report on training	

REQUIREMENTS TRACEABILITY MATRIX							
				equipment Finances to execute training activities Training guides			
3.1.8	Conduct full roll out	To continue full project implementation through to project closure.	Reports, checklist and guidelines	Designate project team members and or IT/ICT consultant Qualification requirements of	High	Reports Checklists Quality audit report Finance reports	

REQUIREMENTS TRACEABILITY MATRIX							
				consultants Training equipment Finances to execute all activities Training guides		Evaluation reports	
4.1	Develop Project Management Plan	To develop all aspects of the PMP	PMP	Designate project team members and or IT/ICT consultant	High	Completed PMP Templates for use by	

REQUIREMENTS TRACEABILITY MATRIX							
				Qualification requirements of consultants Finances to execute all activities		stakeholders to ensure sustainability Site visit reports	
4.1.1	Conduct Project Status Meetings	To keep the project stakeholders up to date on the progress of the project.	Reports and minutes	Designate project team members and or IT/ICT consultant Qualification	Medium	Completed PMP Templates for use by stakeholders to ensure	

REQUIREMENTS TRACEABILITY MATRIX							
				requirements of consultants Finances to execute all activities Consultant		sustainability Site visit reports	
4.1.2	Develop Sustainable Scope Management Plan	To engage all stakeholders to develop a sustainable scope management plan.	Sustainable scope management plan	Designate project team members and or IT/ICT consultant Qualification	High	Completed PMP Templates for use by stakeholders to ensure	

REQUIREMENTS TRACEABILITY MATRIX							
				requirements of consultants Finances to execute all activities Consultant Identify stakeholders		sustainability Sustainability report	
4.1.3	Develop Risk Management Plan	To develop a risk management plan for the	Risk management plan	Designate project team members and or IT/ICT	High	Completed risk management plans	

REQUIREMENTS TRACEABILITY MATRIX							
		projects.		consultant Qualification requirements of consultants Finances to execute all activities Consultant		Templates for use by stakeholders to ensure sustainability	
4.1.4	Update PMP	To provide updated versions of the PMP.	Reviewed and updated PMP	Designate project team members and or IT/ICT	Medium	Completed PMP Templates for	

REQUIREMENTS TRACEABILITY MATRIX							
				consultant Qualification requirements of consultants Finances to execute all activities Consultant		use by stakeholders to ensure sustainability	
5.1	Conduct Project Audit and Evaluation	To perform a project audit before the final handover	Audit report	Project deliverables verified	High	Audit reports	

REQUIREMENTS TRACEABILITY MATRIX							
		of the project.					
5.1.1	Conduct Stakeholders Sustainability Meeting	To engage stakeholders in developing project sustainability.	Sustainability management plan		Medium	Notes Minutes sustainability management plan	
5.1.2	Gain Formal Acceptance	To formally close the project and handover all deliverables to the beneficiary,	Reviewed and updated project documents	Funds for the project team Inputs from data gathering methods among stakeholder	High	Signed documents Closing Letter	

REQUIREMENTS TRACEABILITY MATRIX							
		closing supplier contracts, releasing staff and equipment.					
5.1.3	Update Files and Records	To formally close the project and handover all deliverables to the beneficiary, closing supplier	Reviewed and updated project documents and lessons learnt	Funds for the project team	Medium	Project implementation and performance reports	

REQUIREMENTS TRACEABILITY MATRIX							
		contracts, releasing staff and equipment.					
5.1.4	Archive Files and Documents	To formally close the project and handover all deliverables to the beneficiary, closing supplier contracts, releasing staff	Lessons learnt Lesson updated Contract Closing Letter	Funds for the project team	Medium	Project implementation and performance reports Lessons learnt Lesson updated	

REQUIREMENTS TRACEABILITY MATRIX							
		and equipment.				Contract Closing Letter	

4.3.9 CONFIGURATION/CHANGE MANAGEMENT PLAN

The Change and Configuration Management Plan for the project defines the activities that will manage and control change during the execution and control stage of the project. Change management refers to changes to the plan, process, and baselines, while configuration management deals with changes related to the product scope. The job of the project manager is to raise these requests and ensure that they are properly reviewed.

Any proposed changes to project requirements must be carefully considered before approval and implementation and will be reviewed by the Change Control Board (CCB). Any changes affect the project scope, time, and/or cost. The role of the CCB is to determine the impact of the proposed change on the project, seek clarification on proposed change, and ensure any approved changes are added to the NTRC database. The project sponsor, who also sits on the CCB, is responsible for approving any changes in project scope, time, or cost and is an integral part of the change review and approval process.

4.4 SCHEDULE MANAGEMENT PLAN

Schedule Management Plan for the upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia.

PREPARED BY: YASMIN TYSON

DOCUMENT VERSION

Approved by Project Sponsor: _____

Approved by Beneficiary: _____

Date:_____

Table of Contents

Chart 17: Revisions

(Source: http://pm2alliance.eu/publications)

REVISION	DESCRIPTION OF CHANGE	AUTHOR	EFFECTIVE DATE
v1	Initial document upload	Yasmin Tyson	7/10/22

4.4.0 INTRODUCTION

The project schedule is the roadmap for how the project will be executed. Schedules are an important part of any project as they provide the project team, sponsor and stakeholders with a picture of the project's status at any given time. The purpose of the Schedule Management Plan is to define the approach the project team will use in creating the project schedule. This plan also includes how the team will monitor the project schedule and manage changes after the baseline schedule has been approved. This includes identifying, analysing, documenting, prioritizing, approving or rejecting, and publishing all schedule-related changes.

4.4.1 WORKFLOWS AND ACTIVITIES

A project management workflow is a carefully planned sequence of the tasks and activities you need to do to complete a specific project (Averbuch, 2022). In this project, the tasks and activities are outlined below and is adapted from the templates retrieved from (2021, Project Schedule Management Template, PM^2 Alliance http://pm2alliance.eu/publications).

Plan Schedule Management

Plan Schedule Management is the process of establishing the policies, procedures, and documentation for planning, developing, managing, executing and controlling the project schedule (Akkartal, 2022).

Develop Project Schedule

Developing the project schedule involves analyzing activity sequences, durations, resource requirements and schedule constraints to create the project schedule model.

Monitor and Control Schedule

The process of monitoring the status of the project activities to update project progress and manage changes to the schedule baseline to achieve the plan. Controlling the schedule includes monitoring and controlling any and all of the project schedules. It involves observing the process after project implementation, identifying problems and risks, and deploying a mitigation strategy (CAPMF, 2019).

Schedule Activity and Progress Updates

The process of establishing how and at what intervals project activity and progress updates will be collected during the project.

Schedule Monitoring

The process of establishing how schedule progress updates are being compared to the schedule baseline.

Schedule Control

The process of establishing the control tools and techniques for how the schedule will be managed and how changes will be addressed.

Schedule Reporting

The process of defining what schedule reporting metrics and reports are necessary for the project, at what intervals reporting should occur and to what audiences.

4.4.2 ROLES AND RESPONSIBILITIES

Chart 18: Roles and Responsibilities

(Source: http://pm2alliance.eu/publications)

Name	Roles	Responsibilities
NTRC	Project Sponsor	• Review and approve final schedule baseline and schedule progress reports • Provide overall guidance and mentoring
Yasmin Tyson	Project Manager	• Lead the team in the development of the Schedule Management Plan and the Project Schedule • Lead the project team in Schedule Management related activities • Review, evaluate and provide feedback on schedule progress reports and time-risk recommendations from the Project Scheduler • Provide regular status information in meetings with the Project Sponsor and steering committees
School administrative team	Functional Managers	• Review and approve time estimates for staff reporting to them • Notify the Project Manager and Project Scheduler of workload changes that may affect the schedule • Work with the Project Manager and Project Scheduler on resource schedule-related items for risks, issues

Name	Roles	Responsibilities
		and possible changes
Gilda Marcion	Project Scheduler	• Assist in the development of the Schedule Management Plan • Coordinate daily schedule-related analysis and update activities • Lead the schedule management activities, communicates schedule status, maintains the project schedule and provides updates • Make schedule risk, issue and change recommendations to the Project Manager • Serve as the subject matter expert for Schedule Management processes
Heads of Department	Project Team Members	• Notify the Project Manager and Project Scheduler about possible schedule risks and issues • Assist with schedule estimating activities • Provide accurate time estimates for project work packages • Provide accurate progress reporting during the project
MOE	Business Partners	• Review project schedule and schedule management status and progress documents

4.4.3 SCHEDULE MANAGEMENT PROCESS

The project charter, WBS, WBS dictionary, resource requirements and the scope management plan were the inputs used in the development of the schedule management plan. The schedules for this project will be managed at the individual task level, where each task reflects a task identified at the third level of the approved WBS.

Staff time durations will be measured in terms of hours and/or days, as appropriate. The critical path method will be used to control and monitor the schedules. The project manager is responsible for executing the project schedule and this will be reviewed by the project team and approval of the project sponsor.

4.4.4 SCHEDULE DEVELOPMENT

The project schedule will be developed from the approved WBS constructed as part of the scope management planning effort. The project manager and the appointed project scheduler will identify task durations associated with each task. Microsoft Projects was be used to develop the project schedule as a Gantt chart.

Tasks and their associated activities and durations will be entered into the project schedule software tool, Microsoft Projects, with both predecessor and successor tasks assigned at the activity level. Task sizing will be within the project's established work package limits for both effort and duration. Named resources will be assigned to each task. Once completed, the project manager will examine the schedule to ensure it is technically correct and reasonable. After the schedule is approved, the project will be baselined and put under configuration control.

Chart 19: Project Calendar

(Source: Author of study)

PROJECT CALENDAR	
Project Start Date: July 18, 2022	
Project End Date: December 5, 2022	
Hours of work: 8 1/2 hours	
Lunchtime: 1 hour	
Work week: 40 hours (Monday-Friday)	
Average monthly workdays: 21	
In Work hours: 8:00am-4:30pm, 1:00pm-4:30pm	
Non-working days for project duration: 7	
Non-working days/holidays	**Date**
Emancipation Day	August 1, 2022
Thanksgiving Day	October 1, 2022
National Day	December 13, 2022
Christmas Day	December 25, 2022
Boxing Day	December 26, 2022
New Year's Day	January 1, 2023
New Year's Holiday	January 2, 2023

4.4.5 UNITS OF MEASURE AND LEVEL OF ACCURACY

The units used for schedule development are usually days, hours and production units. Generally, the units of "days" should be used unless there is a reason not to, because the Gantt chart works best in days and the project completion date is on a certain day. Each of the project's resources can also be given defined units of measure. The assigned tasks

were linked together to identify the relationships between deliverables and sub-deliverables.

Usmani (2022), notes the following:

- A predecessor activity comes before a dependent activity in a schedule;
- A successor activity is a dependent activity that comes after another;
- A lead is when the work of a successor activity is started before the predecessor finishes and is indicated by the "-" sign; and
- A lag is a delay of a successor activity, denoted by the "+" sign.

The four (4) types of dependencies used to develop the project schedule for the CICSS project are as follows:

- Finish-to-Start (FS) where the initiation of the successor activity depends upon the completion of the predecessor activity;
- Finish-to-Finish (FF) where the completion of the successor activity depends upon the completion of the predecessor activity;
- Start-to-Finish (SF) where the completion of the successor activity depends upon the initiation of the predecessor activity; and
- Start-to-Start (SS) where the initiation of the successor activity depends upon the initiation of the predecessor activity.

The development of the project schedule was conducted using the processes outlined below:

a) All tasks had at least one (1) successor and one (1) predecessor;

b) There were no unlinked tasks;
c) The start and finish dates were included in the schedule;
d) All dependencies were linked to a detailed task or deliverable; and
e) The earliest and latest date on which a task could start or finish, based on a time analysis approach, were reflected in the Gantt chart.

Viter (2022), states that analogous estimating is one (1) of the most detailed and accurate ways to estimate the cost data for a given project, so that you can set up an accurate cost baseline, without using statistical models. The PMI defines analogous estimating as using the values of parameters, from a previous, similar project, as the basis for estimating the same parameter or measure for a current project. Project parameters that can be estimated through the analogous estimating technique include scope, cost, budget and project duration.

According to the PMI, expert judgment is one (1) of the most common project management planning tools. PMI, further notes that expert judgment requires the engagement of an expertise that is not present within the project team and, as such, it is common for an external group or person, with a specific relevant skill set or knowledge base, to be brought in for a consultation.

Based on the abovementioned information analogous estimating was used for the task durations and expert judgment was used as a baseline for the development of the schedule.

Chart 20: Activities List and Duration Estimates

(Source: Author of study)

Task Name	Duration	Milestone	Start	Finish	Predecessors
Upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the CICSS in Saint Lucia.	101 days	Yes	Mon 18/07/22	Mon 05/12/22	
Commence Initiation Phase	**17 days**	**No**	**Mon 18/07/22**	**Tue 09/08/22**	
Conduct Needs Assessment	3 days	No	Wed 10/08/22	Fri 12/08/22	
Develop Project Charter	5 days	No	Wed 10/08/22	Tue 16/08/22	
Submit Project Charter	1 day	No	Wed 17/08/22	Wed 17/08/22	4
Source Project Sponsor	3 days	Yes	Thu 18/08/22	Mon 22/08/22	4,5
Review Project Charter	2 days	No	Tue 23/08/22	Wed 24/08/22	6
Sign and Approve Project Charter	3 days	Yes	Thu 25/08/22	Mon 29/08/22	6
Conduct Planning Phase	**22 days**	**No**	**Tue 30/08/22**	**Wed 28/09/22**	
Work Breakdown Structure	5 days	No	Tue 30/08/22	Mon 05/09/22	4
Develop preliminary Scope	3 days	No	Wed 07/09/22	Fri 09/09/22	4,6

Task Name	Duration	Milestone	Start	Finish	Predecessors
Statement					
Determine Project Team	2 days	No	Mon 12/09/22	Tue 13/09/22	10
Conduct Project Team Kick off Meeting	1 day	No	Wed 14/09/22	Wed 14/09/22	12
Develop Project management plan	3 days	No	Thu 15/09/22	Mon 19/09/22	8,11,13
Submit Project management plan	1 day	No	Tue 20/09/22	Tue 20/09/22	14
Approve Project Plan	3 days	Yes	Wed 21/09/22	Fri 23/09/22	15
Present Budget	1 day	No	Mon 26/09/22	Mon 26/09/22	8,13,16
Approve Budget	3 days	Yes	Tue 27/09/22	Thu 29/09/22	17
Conduct Execution Phase	**24 days**	**No**	**Thu 29/09/22**	**Tue 01/11/22**	**2,9**
Conduct Project Kick off Meeting	1 day	No	Fri 30/09/22	Fri 30/09/22	16,18
Verify and Validate project scope	3 days	No	Mon 03/10/22	Wed 05/10/22	16,18,20
Design Infrastructure Layout	3 days	No	Tue 11/10/22	Thu 13/10/22	21
Procure Hardware/Software	7 days	No	Fri 14/10/22	Mon 24/10/22	16,18,21,22
Install Technologies	5 days	No	Fri 28/10/22	Thu 03/11/22	22,23
Testing and Review Phase	5 days	No	Fri 04/11/22	Thu 10/11/22	23,24

Task Name	Duration	Milestone	Start	Finish	Predecessors
Perform Adjustments, Upgrades and Installations	5 days	No	Fri 11/11/22	Thu 17/11/22	25
Train Super Users	2 days	No	Thu 17/11/22	Fri 18/11/22	25
Conduct Full Rollout	5 days	Yes	Sat 19/11/22	Thu 24/11/22	25
Conduct Control Phase	**11 days**	**No**	**Wed 02/11/22**	**Wed 16/11/22**	**2,9,19**
Project Management	4 days	No	Fri 30/09/22	Wed 05/10/22	8,16,18
Project Status Meetings	1 day	No	Tue 08/11/22	Tue 08/11/22	30
Sustainable scope Management Plan	2 days	No	Thu 06/10/22	Fri 07/10/22	30
Develop Risk Management Plan	3 days	No	Mon 14/11/22	Wed 16/11/22	30,32
Update Project Management Plan	1 day	Yes	Thu 17/11/22	Thu 17/11/22	30,31,32,33
Perform Closeout Phase	**13 days**	**No**	**Thu 17/11/22**	**Mon 05/12/22**	**29**
Project Audit and Evaluation	5 days	No	Fri 18/11/22	Thu 24/11/22	34
Conduct Stakeholders Sustainability Meeting	1 day	No	Tue 06/12/22	Tue 06/12/22	35
Gain Formal Acceptance	2 days	Yes	Wed 07/12/22	Thu 08/12/22	36
Update Files and Records	3 days	No	Fri 25/11/22	Tue 29/11/22	36
Archive Files and	2 days	Yes	Wed 30/11/22	Thu 01/12/22	39

Task Name	Duration	Milestone	Start	Finish	Predecessors
Documents					

4.4.6 ESTIMATE ACTIVITY RESOURCES

The Program Evaluation Review Technique (PERT) technique uses four (4) standard calculations when determining the appropriate length of a project:

- Optimistic time (O) which is the least possible amount of time required to accomplish a task. This represents the best possible scenario;
- Most likely time (M) which is an educated estimate of how long a task will take to complete without problems or delays. This represents the most realistic scenario;
- Pessimistic time (P) which is the maximum amount of time required to accomplish a task. This represents the worst-case scenario; and
- Expected time (E) which is a reasonable estimate of how long a task will take to complete, taking into account possible problems or delays.

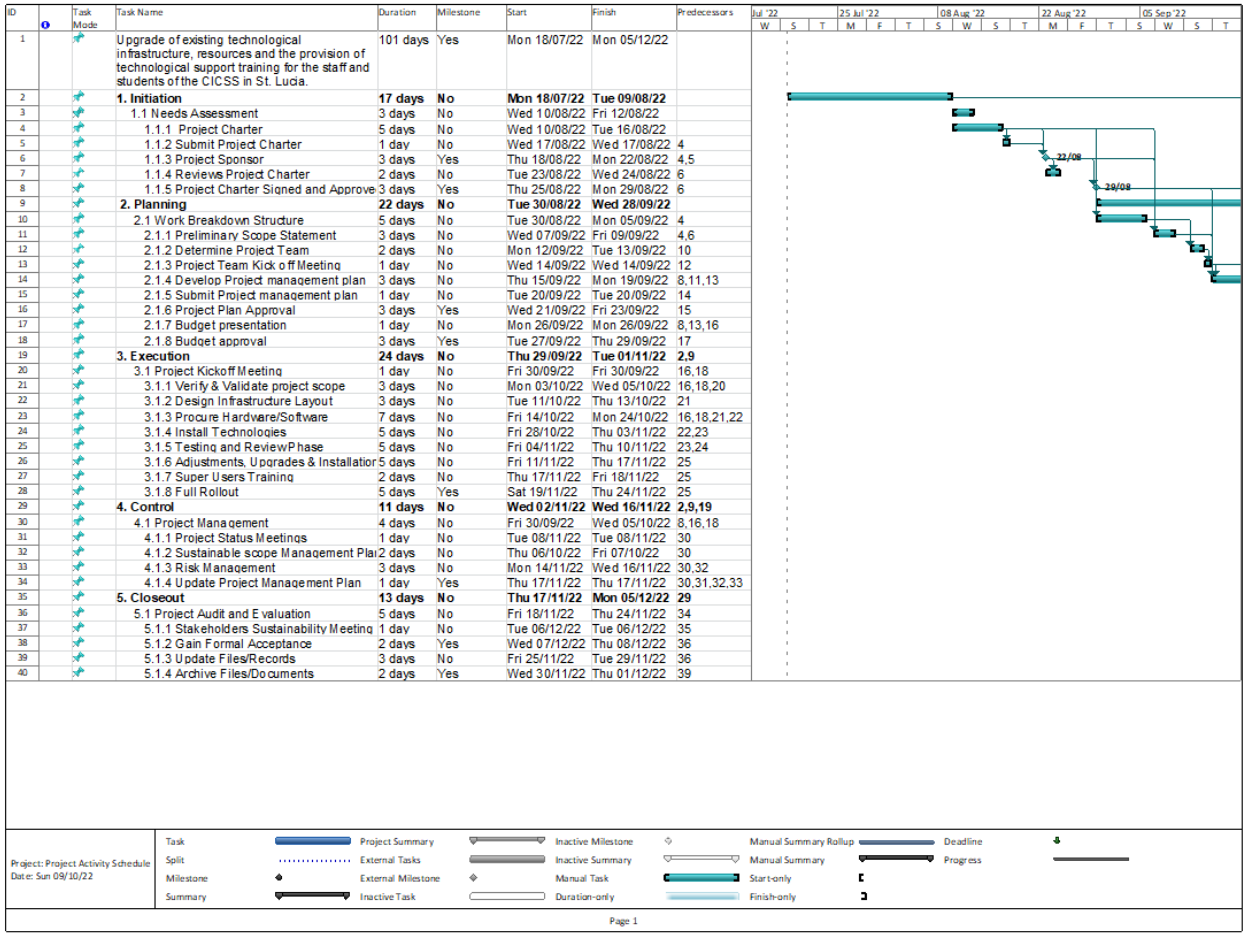
The PERT estimate equation used to determine your expected time is $E = (O + 4M + P)/6$ and related calculations are normally captured in the matrix illustrated in Chart 21.

Chart 21: Estimate Duration Template

(Source: PM2 Alliance http://pm2alliance.eu/publications)

WBS ID	Optimistic Value	Most Likely Duration	Pessimistic Value	Estimated Activity Duration

4.4.7 PROJECT GANTT CHART



ID	Task Mode	Task Name	Duration	Milestone	Start	Finish	Predecessors
1		Upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the CICSS in St. Lucia.	101 days	Yes	Mon 18/07/22	Mon 05/12/22	
2		**1. Initiation**	**17 days**	**No**	**Mon 18/07/22**	**Tue 09/08/22**	
3		1.1 Needs Assessment	3 days	No	Wed 10/08/22	Fri 12/08/22	
4		1.1.1 Project Charter	5 days	No	Wed 10/08/22	Tue 16/08/22	
5		1.1.2 Submit Project Charter	1 day	No	Wed 17/08/22	Wed 17/08/22	4
6		1.1.3 Project Sponsor	3 days	Yes	Thu 18/08/22	Mon 22/08/22	4,5
7		1.1.4 Reviews Project Charter	2 days	No	Tue 23/08/22	Wed 24/08/22	6
8		1.1.5 Project Charter Signed and Approve	3 days	Yes	Thu 25/08/22	Mon 29/08/22	6
9		**2. Planning**	**22 days**	**No**	**Tue 30/08/22**	**Wed 28/09/22**	
10		2.1 Work Breakdown Structure	5 days	No	Tue 30/08/22	Mon 05/09/22	4
11		2.1.1 Preliminary Scope Statement	3 days	No	Wed 07/09/22	Fri 09/09/22	4,6
12		2.1.2 Determine Project Team	2 days	No	Mon 12/09/22	Tue 13/09/22	10
13		2.1.3 Project Team Kick off Meeting	1 day	No	Wed 14/09/22	Wed 14/09/22	12
14		2.1.4 Develop Project management plan	3 days	No	Thu 15/09/22	Mon 19/09/22	8,11,13
15		2.1.5 Submit Project management plan	1 day	No	Tue 20/09/22	Tue 20/09/22	14
16		2.1.6 Project Plan Approval	3 days	Yes	Wed 21/09/22	Fri 23/09/22	15
17		2.1.7 Budget presentation	1 day	No	Mon 26/09/22	Mon 26/09/22	8,13,16
18		2.1.8 Budget approval	3 days	Yes	Tue 27/09/22	Thu 29/09/22	17
19		**3. Execution**	**24 days**	**No**	**Thu 29/09/22**	**Tue 01/11/22**	**2,9**
20		3.1 Project Kickoff Meeting	1 day	No	Fri 30/09/22	Fri 30/09/22	16,18
21		3.1.1 Verify & Validate project scope	3 days	No	Mon 03/10/22	Wed 05/10/22	16,18,20
22		3.1.2 Design Infrastructure Layout	3 days	No	Tue 11/10/22	Thu 13/10/22	21
23		3.1.3 Procure Hardware/Software	7 days	No	Fri 14/10/22	Mon 24/10/22	16,18,21,22
24		3.1.4 Install Technologies	5 days	No	Fri 28/10/22	Thu 03/11/22	22,23
25		3.1.5 Testing and ReviewPhase	5 days	No	Fri 04/11/22	Thu 10/11/22	23,24
26		3.1.6 Adjustments, Upgrades & Installation	5 days	No	Fri 11/11/22	Thu 17/11/22	25
27		3.1.7 Super Users Training	2 days	No	Thu 17/11/22	Fri 18/11/22	25
28		3.1.8 Full Rollout	5 days	Yes	Sat 19/11/22	Thu 24/11/22	25
29		**4. Control**	**11 days**	**No**	**Wed 02/11/22**	**Wed 16/11/22**	**2,9,19**
30		4.1 Project Management	4 days	No	Fri 30/09/22	Wed 05/10/22	8,16,18
31		4.1.1 Project Status Meetings	1 day	No	Tue 08/11/22	Tue 08/11/22	30
32		4.1.2 Sustainable scope Management Plai	2 days	No	Thu 06/10/22	Fri 07/10/22	30
33		4.1.3 Risk Management	3 days	No	Mon 14/11/22	Wed 16/11/22	30,32
34		4.1.4 Update Project Management Plan	1 day	Yes	Thu 17/11/22	Thu 17/11/22	30,31,32,33
35		**5. Closeout**	**13 days**	**No**	**Thu 17/11/22**	**Mon 05/12/22**	**29**
36		5.1 Project Audit and Evaluation	5 days	No	Fri 18/11/22	Thu 24/11/22	34
37		5.1.1 Stakeholders Sustainability Meeting	1 day	No	Tue 06/12/22	Tue 06/12/22	35
38		5.1.2 Gain Formal Acceptance	2 days	Yes	Wed 07/12/22	Thu 08/12/22	36
39		5.1.3 Update Files/Records	3 days	No	Fri 25/11/22	Tue 29/11/22	36
40		5.1.4 Archive Files/Documents	2 days	Yes	Wed 30/11/22	Thu 01/12/22	39

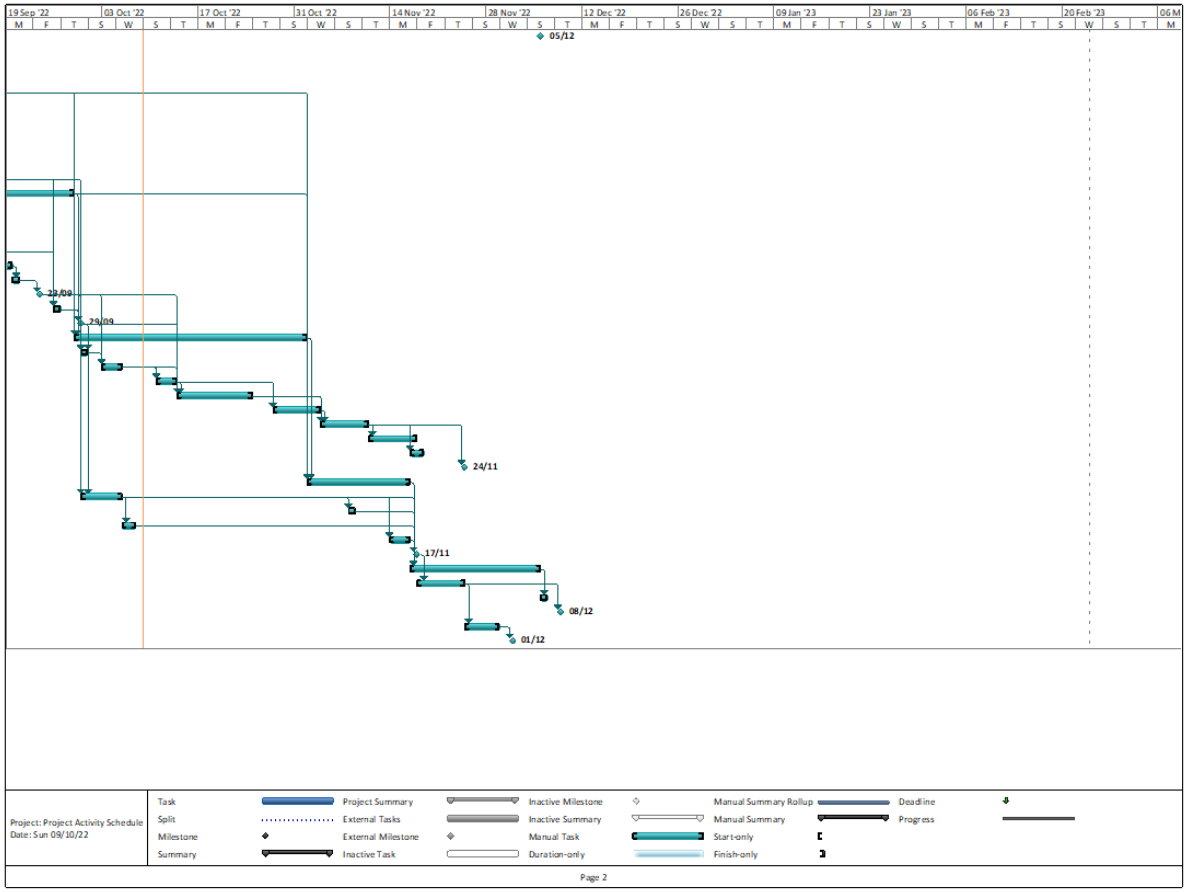


Figure 25: Project Gantt Chart

(Source: Author of study)

4.4.8 PROJECT SCHEDULE METRICS

The project will use Schedule Variance (SV) and Schedule Performance Index (SPI) calculations as the basis for measuring schedule performance. In addition, the Earned Value Management (EVM) methodology will also be utilized to integrate schedule, cost and scope to measure the project performance. EVM integrates the scope baseline with the cost baseline and schedule baseline to form the performance measurement baseline (PMI, 2017). EVM allows the project manager to answer these three questions:

1. Where have we been?
2. Where are we now?
3. Where are we going?

Earned Value Management (EVM) also allows the project manager to evaluate, predict and adjust project performance.

Once it has been determined that 20% of the project has been implemented by the project team, the Earned Value Management (EVM) would be used to predict the future of the project with a plus and minus 10% deviation. This approach allows for benchmarking and comparing the status against the project baseline to determine its critical paths. Performance metrics will be used to inform crucial decisions that keep projects on track including SV, planned versus actual tasks using SPI and Estimate to Complete (ETC).

4.4.9 CONTROL THRESHOLDS

Variance thresholds for monitoring schedule performance may be specified to indicate an agreed upon amount of variation to be allowed before some action needs to be taken. Thresholds are typically expressed as percentage deviations from the parameters established in the baseline plan. The SV threshold controls the project's schedule performance. Project managers can use variance thresholds to help identify potential issues with cost and schedule performance. The goal is to identify issues before they become catastrophic and have time to impact project objectives (Humphreys & Associates, 2022).

Based on the abovementioned, the project team will identify the affected tasks, calculate the variance and recommend an alternative for the consideration and endorsement of the project sponsor and the beneficiary. The SV metric will be used to keep the CICSS project on track and is calculated by subtracting the budgeted cost of work performed from the cost of work scheduled. That is, SV = EV (Earned Value)–PV (Planned Value)

- If SV < 0, the project is behind schedule;
- If SV = 0, the project is right on schedule; and
- If SV > 0, the project is ahead of schedule.

PV indicates how much work was planned to be completed at that point in the project and the SV will be reported monthly.

Yarbrough (2022), describes the SPI as part of a greater project performance measurement method, the EVM. The SPI itself is a ratio of EV to PV. Depending on the

resultant integer value, SPI reflects a project being on schedule, behind schedule or ahead of schedule. More specifically, to find the SPI, first find the PV and EV then divide this EV integer by the PV integer; Thus, the SPI formula is reflected mathematically below.

SPI = EV/PV:

- If SPI < 1, the project is behind schedule;
- If SPI = 1, the project is right on schedule; and
- If SPI > 1, the project is ahead of schedule.

Like the SV, the higher the value, the better it is for the project. If the SPI is above 1, the project is good and the project manager would then provide a report outlining the reasons for the exceptions. If, however, the SPI it is below 1, the project is in trouble and the project manager would be required to provide a report detailing the corrective actions, including the cost implications and the associated risks. The SPI is a percentage value and the value 1 represents that 100% of the work expected at a certain point is complete and an SPI of 1.2 means that the project is 20% ahead of schedule. Therefore, SPI is the other metric that will be used in the CICSS project, on a monthly basis, to control thresholds.

4.4.10 SCHEDULED CONTROL

Controlling Schedule is the process by which progress on project activities is compared against the schedule baseline to understand whether the project is ahead or behind of the schedule. Based on the deviation, the project manager can plan corrective or preventive actions and manage changes to the baseline. This process helps reduces the risk

of delivery slippage, when managed effectively. The project will be guided by the following techniques outlined in Chart 22 which highlights the schedule control definitions.

Chart 22: Schedule Control Definitions

(Source: http://pm2alliance.eu/publications)

Technique	Definition
Performance Reviews	Performance reviews measure, compare and analyze schedule performance, e.g., actual start and finish dates, percent complete and remaining duration for the work in progress.
Critical Path Method (CPM)	CPM is used to predict project duration by analyzing the sequence of activities (network path) that has the least amount of scheduling flexibility. Earlier dates are calculated by a forward pass using a specified start date. Later dates are calculated by a backward pass starting from a specified completion date.
Variance Analysis	Variance Analysis is used to determine the causes of a variance, e.g., the difference between an expected result and an actual result.
Adjust Leads and Lags	A lead is a modification of a logical relationship that allows an acceleration of the successor activity, e.g., when a task has a finish-to-start dependency with a 10-day lead, the successor activity can start as much as ten (10) days before the predecessor activity has finished. A lag is a modification of a logical relationship that directs a delay in the successor activity, e.g., when a task has a finish-to-start dependency with a 10-day lag, the successor activity cannot start until ten (10) days

	after the predecessor activity has finished. Adjusting leads and lags is used to find ways to bring lagging project activities into alignment with the plan.

The CPM will be used for schedule control and the project manager will review the critical path monthly, when a new baseline is required, when entering a new project phase, when mitigating schedule-related risks, and as needed to ensure the critical path is maintained.

The SV and SPV will be utilized in this project and the project's schedule performance will be analyzed by comparing the actual performance against the schedule baseline at each phase throughout the project's lifecycle. The data obtained from this process will provide information for a change request; help identify new risks and resources; and cost analysis of the overall project. The project team members will report to the project manager on a weekly, fortnightly or monthly basis, according to their assigned tasks. Weekly, fortnightly or monthly updates, to the project schedule, will reflect actual project performance. Further, scheduled reports will be available at specified time intervals during the project (see Chart 23).

Chart 23: Scheduled Reports

(Source: http://pm2alliance.eu/publications)

Report	Frequency	Author	Reporting Responsibility
Resource Task Lists and Work Packages	Weekly	Project Supervisors	Generate individual resource task lists and work packages from the scheduling tool and make them available online to project team members.
Project Schedule Report	Monthly	Project Manager	Generate the schedule progress report for use in the project status meeting.
Project Master Schedule (Gantt chart)	Monthly	Project Manager	Generate the updated schedule Gantt chart for use in the project status meeting.
Sponsor Project Report	Monthly	Project Manager	Generate the sponsor project status report for presentation to the Project Sponsor.
Project Consultancy Report	Fortnightly	Project Consultant	Generate the CICSS project status report for submission to project team and sponsor for review.

4.5 COST MANAGEMENT PLAN

Cost Management Plan for the upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia.

PREPARED BY: YASMIN TYSON

DOCUMENT VERSION

Approved by Project Sponsor: _____

Approved by Beneficiary: _____

Date:_____

Chart 24: Revision

(Source: Author of study)

REVISION	DESCRIPTION OF CHANGE	AUTHOR	EFFECTIVE DATE
v1	Initial document presented for approval	Project Team	26/09/22
v2	Revised based on feedback	Project Team	28/09/22

ABSTRACT

The purpose of this cost management plan is to define the methodology by which costs associated with the CICSS project will be managed throughout the project lifecycle. To ensure the successful completion of the project within the allotted budget, this plan sets the format and standards by which the project costs are measured, reported and controlled. Several cost components are associated with this project. Metrics, cost variance considerations and reporting activities will be outlined in this plan. To complete this project successfully, all key project members and stakeholders must adhere to and work within this cost management plan and the overall project plan it supports.

The Plan was developed based on a template retrieved from (2019, Cost management Plan Template, Project Management Docs. https://www.projectmanagementdocs.com/template/project-planning/cost-management-plan/#axzz7hKDHWL7B)

Table of Contents

4.5.7 Cost Controls

4.5.0 INTRODUCTION

The cost management plan clearly defines how the costs on a project will be managed throughout the project's lifecycle. It sets the format and standards by which the project costs are measured, reported and controlled.

The project manager will be responsible for managing and reporting on the project's cost throughout the duration of the project. During the monthly project status meeting, the project manager will meet with management to present and review the project's cost performance for the preceding month. Performance will be measured using EV calculations. The project manager is responsible for accounting for cost deviations and presenting the project sponsor with options for getting the project back on budget. The project sponsor has the authority to make changes to the project to bring it back within budget.

4.5.1 COST MANAGEMENT APPROACH

The project manager and the project sponsor(s) for the CICSS project will jointly create the cost baseline and the cost management plan. Beginning with the preliminary cost estimates identified in the Initiation phase, the project manager will develop updated cost estimates to perform the work included in the revised schedule.

Costs for this project will be managed at the third level of the WBS and control accounts (CA) will be created, at this level, to track costs. EV calculations, for the CA, will measure and manage the financial performance of the project.

The cost management plan establishes the activities and criteria for planning, structuring and controlling project costs. Actual costs and cost variances must be reported regularly to project team and project sponsors. Any cost change over 5% requires project manager's approval. Costs may be rounded to the nearest dollar and work hours rounded to the nearest whole hour.

PMI (2017), notes that the accuracy of single-point duration estimates may be improved by considering estimation uncertainty and risk. Using three-point estimates helps define an approximate range for an activity's duration, that is:

- Most likely (tM) where this estimate is based on the duration of the activity, given the resources likely to be assigned, their productivity, realistic expectations of availability for the activity, dependencies on other participants and interruptions;
- Optimistic (tO) where the activity duration based on analysis of the best-case scenario for the activity; and
- Pessimistic (tP) where the duration based on analysis of the worst-case scenario for the activity.

Cost variances of +/- 0.1 in the cost and SPI will change the status of the cost to cautionary and those values will be changed to yellow in the project status reports. Cost variances of +/- 0.2 in the cost and SPI will change the status of the cost to an alert stage; as such, those values will be changed to red in the project status reports. This will require corrective action from the project manager in order to bring the cost and/or SPI below the alert level. Corrective actions will require a project change request and must be approved by the project sponsor before it can be accepted within the scope of the project.

4.5.2 ROLES AND RESPONSIBILITIES

Chart 25: Roles and Responsibilities

(Source: Author of study)

Roles	Responsibilities
Procurement Specialist– project team	• Track project costs • Reconciles project cost • Assist in cost research and ensures cost transactions are adequately documented • Manage overall project within the budgetary constraints • Report issues to the project management team on project cost deviations • Approve funding documents and represents CICSS at the budget meetings • Review, approves or denies project expenditures at the weekly project management meeting
MOE	• Review project funding documents • Review, approve or deny project expenditures at the weekly project management meeting
Project Manager	• Lead the cost management effort • Track activities • Facilitate communication on fiscal status • Ensure the project cost tool and supporting documentation is

Roles	Responsibilities
	maintained • Approve cost management plan • Provide recommendations and statuses on the project budget and expenditures • Ensure project funding and approval documents and expenditure tracking and reconciliation in accordance with state processes • Develop the project costs based on project need • Manage costs in keeping with the latest approved baseline • Review project funding documents, reviews and approves (or denies) project expenditure at the weekly project management meeting
Team Leads	• Identify funding needs and ensures all transactions have appropriate supporting documentation to assist in the tracking of expenditures, including tracking of staff efforts and costs
NTRC Finance Department	• Coordinate the review and submission of budgetary documents, budget change concepts and budget change proposals to Accounts Department at the MOE

4.5.3 COST PLANNING AND ESTIMATING

Plan Cost Management is the process of defining how the project costs will be estimated, budgeted, managed, monitored and controlled, (PMI, 2017). Cost planning and cost estimating outcomes provide the framework for cost control through the lifecycle of

any initiative. Cost Planning consists of the activities performed to identify and categorize costs based on project needs throughout the project lifecycle. The project objectives and deliverables are taken into consideration in the cost planning process.

Estimate Costs is the process of developing an approximation of the cost of resources needed to complete project work (PMI, 2017). A cost estimate is a quantitative assessment of the likely costs of resources required to complete the activity. The estimating process will include all the resources needed to complete project activities including consultancy services, installations, hardware, software, upgrades and contingency cost. The project costs are estimated using analogous and bottom-up estimating from historical and recent projects of a similar nature and scope. The budget includes a 10% contingency reserve and only the sponsor can authorize its use.

A 'bottom-up' approach will be used for preparing a detailed cost estimate of each cost component involved with each project activity. Costs estimates will be prepared using the best information available at the time of estimation. The budget was developed based on the third activity level of the WBS, which were totaled to form the request for funding and the overall project budget. The budget was in Eastern Caribbean Dollars (XCD). The cost baseline will be used to measure and monitor the project's cost performance and the project sponsor is responsible for approving changes to the project cost baseline.

4.5.4 PROJECT BUDGET

Budget determination involves the process of aggregating the estimated costs of individual activities or work packages to establish a baseline for the project budget. The project budget consists of the sum total of the monetary resources necessary to successfully execute the project including the use of internal resources, e.g., existing staff who will work on the project. A budget baseline should be established for the entire project in an amount equal to the total cost of ownership calculated during cost estimation.

Once the needs of the CICSS project have been determined, the project team will finalize the resource and staffing requirements necessary for the successful completion of the project. The project manager and the project team will respectively complete the internal and external WBS. CA and staff labor categories will be created in each WBS element. Based on the labor costs and planned duration of each WBS element, an estimate will be determined. WBS element costs will then be totaled and verified against the allotted project budget.

When the project budget is approved, the project manager and team leads will compare the allocation for each WBS element against the overall budget and adjust allocations, as necessary, to comply with the project budget. Once all allocations have been reviewed and approved by the project manager, the project budget will be baselined. The project budget baseline may only be changed with authorization by the project sponsor. Once the sponsor approves the budget, it would be used for comparing planned versus

actual costs. Accordingly, the project's financial manager is responsible for producing the reports

Chart 26: Project Budget

(Source: Author of study)

Equipment, Software, Infrastructure, Installations	Quantity	Unit Costing (XCD$)	Total Cost (XCD$)	% 0f Total Budget
Security Cameras	25	$1,100.00	$27,500.00	5.77%
Wi-Fi ¼ Mile Omni directional: Access points, Gateways	8	$5,000.00	$40,000.00	8.39%
SMART Led TV	9	$3,162.38	$28,461.42	5.97%
Interactive Whiteboards	10	$12,739.81	$127,398.10	26.73%
24 Port Network Managed Switches	3	$2,000.00	$6,000.00	1.26%
Portable Charging Cart for 24 laptops	2	$6,000.00	$12,000.00	2.52%
Computer Servers	3	$27,000.00	$81,000.00	17.00%
Software Licenses	5	$3,000.00	$15,000.00	3.15%
Installations	5	$1,000.00	$5,000.00	1.05%
Laptop Computers	48	$3,100.00	$148,800.00	31.22%
Projectors	10	$2,000.00	$20,000.00	4.20%
Desktop Computers	77	$3,500.00	$269,500.00	56.55%
24" Monitors	77	$550.00	$42,350.00	8.89%
Graphic Tablets	12	$2,500.00	$30,000.00	6.29%

3D Printers	2	$2,750.00	$5,500.00	1.15%
Laser Printers	5	$5,000.00	$25,000.00	5.25%
Toner	8	$820.00	$6,560.00	1.38%
VR Headsets System	25	$810.00	$20,250.00	4.25%
Air Condition Units 24BTU	4	$4,000.00	$16,000.00	3.36%
UPS line conditioners to regulate power flow	8	$800.00	$6,400.00	1.34%
16 channel NVR	1	$5,000.00	$5,000.00	1.05%
			$937,719.52	
Project Team salaries	Per Month	Per Annum		
Project Manager	$8,000.00	$96,000.00		20.14%
Project Administrative Assistant	$5,000.00	$60,000.00		12.59%
Project Accountant	$6,500.00	$78,000.00		16.37%
Consultant	$6,500.00	$78,000.00		16.37%
Technician	$3,000.00	$36,000.00		7.55%
			$348,000.00	

Contingency			$128,571.95	
		Total Budget	$1,285,719.52	

4.5.5 MEASURING PROJECT COST

The performance of the project will be measured using EVM. Four (4) EV metrics, i.e., SV, CV, SPI and cost performance index (CPI), will be used to measure the project cost performance.

If the SPI or CPI have a variance between 0.1 and 0.2, the project manager will report the reason for the exception. If the SPI or CPI have a variance of greater than 0.2, the project manager must report the reason for the exception and provide management a detailed corrective plan to bring the projects performance back to acceptable levels.

Chart 27: Performance Measures

(Sources: Author of study)

Performance Measure	Yellow Condition	Red Condition
SPI	Between 0.9 and 0.8 or Between 1.1 and 1.2	Less Than 0.8 or Greater than 1.2
CPI	Between 0.9 and 0.8 or Between 1.1 and 1.2	Less Than 0.8 or Greater than 1.2
To Complete Performance Index (TCPI)	Between 0.9 and 0.8 or Between 1.1 and 1.2	Less Than 0.8 or Greater than 1.2

As stated, the SV is a measure of schedule performance expressed as the difference between the EV and PV (PMI, 2017), and it will be used by the project manager to determine how much the project is ahead or behind schedule. The SV formula is EV – PV

and if the SV is zero, the project is considered to be on schedule; if the SV is greater than zero, the project is earning more value than planned and is considered to be ahead of schedule; and if the SV is less than zero, the project is earning less value than planned and is considered to be behind schedule.

The Cost Variance (CV) is the amount of budget deficit or surplus at a given point in time, expressed as the difference between the EV and actual cost (AC) (PMI, 2017). The formula for calculating the CV is EV–AC and if CV is zero, the project is considered to be on budget; if CV is greater than zero, the project is earning more value than planned and is considered to be under budget; and if CV is less than zero, the project is earning less value and is considered to be over budget.

The SPI is a measure of schedule efficiency expressed as the ratio of EV (performed work) to PV (scheduled work) (PMI, 2017). It measures how efficiently the project team is accomplishing the work. The formula for calculating SPI is EV/PV and if EV is less than the PV then the value is less than 1, the project is considered to be behind schedule; and if EV is greater than the PV then the value of the SPI is greater than one, the project is considered to be ahead of schedule. By extension, a well performing project should have its SPI as close to 1 as possible.

The CPI is a measure of the cost efficiency of budgeted resources, expressed as a ratio of EV to AC (PMI, 2017) and it measures the cost efficiency for completed work. A CPI value of less than 1 indicates a cost overrun for work completed and a CPI value

greater than 1 indicates a cost underrun of performance to date. The formula for calculating CPI is EV/AC and if CPI is equal to 1 the project is considered to be on budget.

4.5.6 COST REPORTING FORMAT

Cost management measures will be reported in the monthly CICSS Project Status Report. All cost variances outside of the thresholds, identified in this Cost Management Plan, will be highlighted and aligned with appropriate planned corrective actions. Change requests triggered by project cost overruns will be identified and tracked in the monthly status report.

Reporting for cost management will be included in the monthly project status report. The Monthly Project Status Report will include a section labelled, “Cost Management” and this section will contain the EV metrics. All cost variances outside of the thresholds identified in this cost management plan will be reported on, including any planned corrective actions. Change requests which are triggered based upon project cost overruns will be identified and tracked in this report.

4.5.7 COST CONTROLS

EcoSYS (2021), defines cost control as the process of measuring cost variances from the baseline and taking appropriate action, e.g., increasing budgetary allocations or reducing the scope of work to correct related gaps. Cost control is a continuous process done throughout the project lifecycle. The emphasis herein is equally on timely and clear reporting, and proper measurements.

The success of the CICSS project is dependent on the ability of the project team to control costs and deliver within the specified timeframe. The project manager will track how the project's spending varies from baseline expectations throughout the life of the project and create corrective plans, if necessary, to ensure success.

The project manager is responsible for the project's cost controls, including operating and monitoring software, and investigating any cost differences. Good project cost control requires a detailed knowledge of the project's planning and execution. The project manager will identify when the project exceeds the projections and put mitigation measures in place to curb this situation.

The cost control process will be used with the project change request process. Approvals for project budget/cost changes must be approved by the project sponsor. A summarization of the change control process is as follows:

i. Monitor cost performance (actual versus planned);
ii. Identify and investigate cost variances;
iii. Forecast final cost;
iv. Identify and document changes;
v. Adjust budget based on approved cost changes; and
vi. Communicate changes to the project team and other relevant stakeholders.

The project sponsor, NTRC, along with the project manager is charged with the responsibility to implement cost control measures. Project manager implements tracking procedures to see how the project's spending compares to the projected costs, and, if it is different, the variance is calculated.

The project manager along with the project sponsor will look at project plan to see what potential corrective actions could bring the project back within budgetary specifications, if it is over budget. Depending on the project, this may involve adjusting the schedule, the staffing or the project timeline to reduce costs.

The project manager and procurement officer will implement corrective actions by negotiating with teammates, vendors or contractors. They may also communicate with the client to explain the changes and the reasoning behind them. The project manager then uses the new data and the budget tracking practices to evaluate whether the corrective actions were effective. If not, the project manager creates and implements new corrective actions until they get the desired results.

4.6 QUALITY MANAGEMENT PLAN

Quality Management Plan for the upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the CICSS in Saint Lucia.

PREPARED BY: YASMIN TYSON

DOCUMENT VERSION

Chart 28: Document Control Information

(Source: https://www.pm2alliance.eu/publications)

Settings	Value
Document Title	Quality Management Plan
Project Title	Project Management Plan for the upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia.
Document Author	Yasmin A. Tyson
Project Owner (PO)	Ciceron Secondary School
Project Manager (PM)	Yasmin A. Tyson
Doc. Version	v1
Sensitivity	Public
Date	30/10/2023

Document Approver(s) and Reviewer(s):

Name	Role	Action	Date
		<Approve / Review>	

Abstract

The purpose of the Quality Management Plan is to describe how quality will be managed throughout the project's lifecycle. The Quality Management Plan confirms that a product or service that is delivered conforms to contract requirements and meets the needs of the customer. The quality management process is iterative and incremental. The process encompasses quality requirements identification, planning, implementation and execution of the plan. Once the plan is operational, the Quality Assurance (QA) team leverages the plan to assess, measure, monitor and continually improve the plan. This plan was developed based on a template from (2021, Project Quality Management Template, PM^2 Alliance http://pm2alliance.eu/publications) and (2022, Quality Management Plan Template, Tennessee State Government, https://www.tn.gov/content/dam/tn/finance/tbsm/TBSMQualityManagementPlan.docx)

Table of Contents

4.6.5 Quality Metrics and Measurements

4.6.5.1 Measuring Reports

4.6.6 Quality Assurance

4.6.7 Quality Control

4.6.0 INTRODUCTION

A QMP assists the Project Manager and project team to execute project quality management and assurance activities. Quality management is the act of overseeing all activities and tasks that must be accomplished to maintain a desired level of excellence and includes the determination of a quality policy, and creating and implementing quality planning, assurance, control, and improvement activities. A QMP documents the process for ensuring quality measure are implemented on a project by defining quality methodology, standards, criteria, activities, expectations, tools and resources, reporting and corrective actions. The QMP serves as the foundation for quality management on any project.

4.6.1 QUALITY MANAGEMENT OBJECTIVES

Project quality management aims to ensure that the current project will meet the expected results in the most efficient way and that deliverables will be accepted by the relevant stakeholders. It involves overseeing all activities needed to maintain a desired level of excellence. This includes creating and implementing quality planning and assurance, as well as quality and quality improvement.

More specifically, the QMP is intended to accomplish the following CICSS project objectives:

- Outlines the purpose and scope of quality activities;
- Defines how quality will be planned and managed;
- Defines QA activities;

- Defines QC activities;
- Defines acceptable quality standards; and
- Defines roles and responsibilities for quality management activities.

4.6.2 QUALITY MANAGEMENT PROCESS

The project quality management process comprises all activities that will increase the ability to meet the project expected results as identified in the project charter. Figure 26 outlines the various steps in the quality management process.

Figure 26: Quality Management Process

(Source: https://portal.ct.gov/-/media/Departments-and-Agencies/DSS/CT-METS/Library/General/CTDSSQualityManagementPlanv11.pdf?la=en&hash=F2077EC8ADE3B5625C58E2E380868FA4)

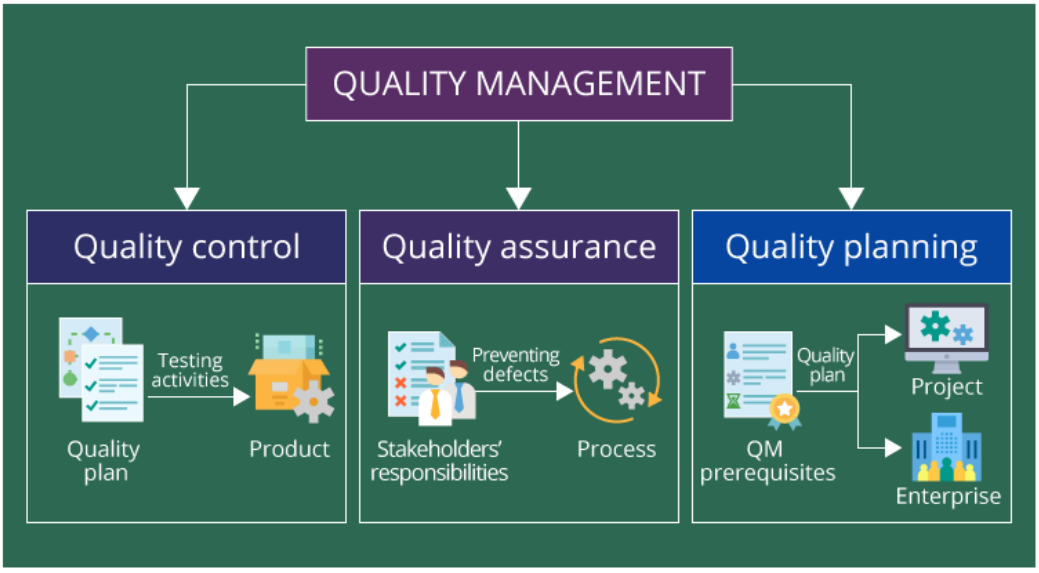


Figure 27: Quality Management

(Source: https://www.scnsoft.com/software-testing/quality-management-optimization)

The quality management process for this project comprises five (5) key steps, namely:

- Define the project quality;
- Perform quality assurance;
- Perform quality control;
- Perform deliverables acceptance; and
- Perform the Final CICSS project acceptance.

Define Project Quality

The purpose of this step is to identify the objectives, approach, requirements, activities and responsibilities of the project's quality management process and how it will be implemented throughout the project. These are documented in this plan based on the project objectives, approach, deliverables, expected benefits and resources available.

The QMP includes appropriate descriptions of the following:

- Quality objectives, approach and requirements;
- Quality standards, guidelines, tools and techniques, e.g., the quality review checklist and deliverables acceptance checklist;
- Quality assurance activities and related responsibilities, e.g., project review meetings, monthly activities report, and compliance verification and audits to contractors' quality assurance activities; and
- Quality control activities for continuous improvement, e.g., project management artefacts review and quality plans reviews.

The techniques that will be used for the CICSS project's quality planning will be cost benefit analysis (CBA) and cost of quality (CoQ). The PM will determine the balance between deliverables' cost, time, risk and quality of based on a CBA and define the quality assurance and control activities.

Perform Quality Assurance

The purpose of this step is to verify the performance and compliance of project activities with the defined quality requirements. The quality assurance activities are defined based on the overall project management approach and are part of the CICSS project work plan.

Quality assurance will be performed by evaluating the design of the project controls, by confirming that they are implemented, and by assessing their operational effectiveness. These activities will consider the project quality objectives along with the project risks. The CICSS project will be in compliance with the Saint Lucia Bureau of Standards (SLBS) and the MOE rules and regulations, and with other relevant governmental and industrial rules, regulations and legislation.

Quality assurance activities will be performed by a Project Quality Assurance (PQA) team member, and SLBS and MOE representatives, and outsourcing audits to external entities/auditors will be performed when necessary. The results of the quality assurance activities will be documented in the relevant quality and status reports or/and in relevant project logs. Recommendations for improvements may result from quality assurance and are processed by quality control in the form of change requests.

Perform Quality Control

The purpose of this step is to monitor and consolidate results from the quality assurance activities in order to assess compliance and performance, recommend necessary changes, and plan new or refined existing quality assurance activities. Quality monitoring and controlling is performed throughout the project lifecycle by the PM.

The quality review checklist will be used by the PM to evaluate the quality control activities and validate compliance with the plans for scope, time, cost, quality, project organization, communication, risks, contracts and client satisfaction. The PM will

summarize and document the quality review checklist findings, their impact, recommendations and any remediation or improvement actions. The project logs will then also be used to document related risk, issues, decisions and changes.

The PM will determine the effectiveness of project processes, look for potential improvements in processes efficiencies, analyze measurement results and their effectiveness, and develop quality review reports to consolidate results and recommendations.

The results of the QA activities will be used to improve the quality of project activities, so they may generate change requests for corrective or preventive actions, or updates in project documentation. After the identification of all non-conformities or opportunities for improvement, the PM will elaborate and validate recommendations, and establish action plans in consultation with the relevant stakeholders.

Actions may result in change requests, the identification of new risks and issues, the rescheduling of activities or the adding new ones to the project work plan. It can also identify training and resources needs, and additional quality assurance activities. These actions will identify which project documentation should be updated and the ID of the action from the related documents (project logs or project work plan). All these actions will be incorporated (at least the most effort and cost consuming ones) into the project work plan, in order to have a consolidated view of all project related activities.

All changes to the Quality Management Plan and deliverables acceptance plan will be agreed upon by the relevant stakeholders and then approved by the PM.

Perform Final Acceptance

The purpose of this step is to manage the final acceptance of the project, including the accepted deliverables, and to perform the administrative closure of the project. The final acceptance is obtained from the Project Owner (PO) and project sponsor.

Before the formal project sign-off, the PM will report on project performance in the Project-End Review Meeting, discuss lessons learned and develop the Project-End Report. This report should summarize project performance throughout project lifecycle and describe the main risks, issues, constraints, opportunities and lessons learned. It can also identify stakeholders' satisfaction level based on questionnaires or other type of received feedback. The pitfalls, best practices and solutions implemented should be maintained in a project repository which remains accessible for future projects.

The administrative closure of the project includes updating, reviewing, organizing and archiving all project documentation and records, with support from the SLBS and MOE. It also comprises the release of project resources, final project acceptance and communication of project end to the relevant stakeholders. The phase-exit review checklist will be used to validate the completion of project activities.

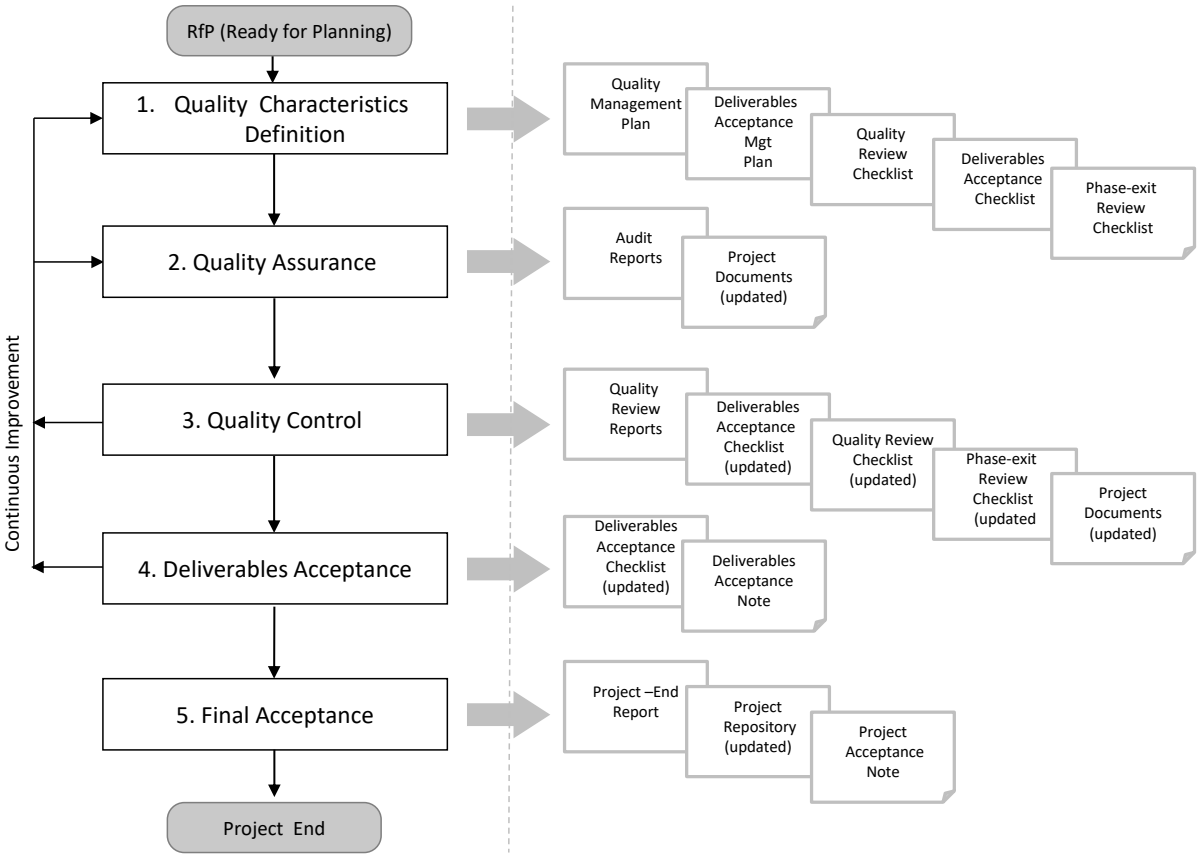


Figure 28: Quality Management Processes

(Source: https://www.pm2alliance.eu/publications)

4.6.3 ROLES AND RESPONSIBILITIES

All members of the CICSS project team will be given roles and responsibilities in quality management. It is imperative that the team ensures that work is completed at an adequate quality level from individual work packages to the final project deliverable.

Chart 29: Roles and Responsibilities

(Source: Author of study)

Roles	Responsibilities
Sponsor	• Approve all quality standards for the CICSS project • Review quality reports and assists in resolution of escalated issues • Sign off authority on the final acceptance of the project deliverables
Project Manager	• Implement the QMP to ensure all tasks, processes and documentation are compliant with the plan • Oversee quality management throughout the duration of the project • Collaborate with the quality manager, quality specialists and process owners to develop quality metrics and standards by phase • Ensure team member compliance with quality management processes • Support the quality manager to secure resources to perform quality management • Participate in quality management reviews, as required • Provide oversight to the closure of corrective actions arising from quality reviews • Communicate quality standards to the project team and stakeholders

CICSS Quality Manager	• Provide overall leadership of quality management activities, including managing quality reviews and overseeing follow-on corrective actions • Develop and maintains the project quality assurance plan • Generate and maintains a schedule of software quality assurance activities • Collaborate with the PM, quality specialists and process owners to develop quality metrics and standards • Schedule and performs evaluations of process quality assurance reviews • Escalate non-compliance issues to the PM • Update the QMP and maintains the overall quality standards for the CICSS project's processes and products. • Provide oversight to the closure of corrective actions arising from quality reviews
CICSS PROJECT Quality Specialists /Team Leads/ Managers	• Oversee and support the application of quality standards for the CICSS project processes and products to their respective team members • Collaborate with the quality manager and process owners in the development of the quality plan, including quality metrics and standards • Participate in quality management reviews, as required • Perform QA activities and QC inspections, as appropriate • Recommend tools and methodologies for tracking quality and standards to establish acceptable quality levels • Create and maintain QC and QA logs throughout the project • Conduct and process product assessments, as defined herein, using

	objective criteria • Communicate results from assessments to relevant stakeholders • Ensure resolution of non-compliance instances and escalate any issues that cannot be resolved within the project • Identify lessons learned that could improve processes for future products • Develop and maintain metrics
CICSS Project Process Owners	• Oversee and support the application of quality standards for the CICSS project processes • Collaborate with the PM, quality manager and quality specialists in the development of quality metrics and standards Participate in quality management reviews, as required

The following RASCI table defines the responsibilities of those involved in quality management, that is, those responsible for carrying out the entrusted task, responsible for the whole task (and who is responsible for what has been done), who provide support during the implementation of the activity/process/service, who can provide valuable advice or consultation for the task, and who should be informed about the task progress or the decisions on the task. Here, we introduce the some new key stakeholders to be reflected in the quality management plan RAM (RASCI) chart, namely: Project Owner (PO); Head of Department (HOD); Saint Lucia Bureau of Standards (SLBS); Project Manager (PM) and CICSS Administrative Team (AT).

Chart 30: RAM (RASCI)

(Source: https://www.pm2alliance.eu/publications)

RAM (RASCI)	MOE	NTRC	PO	HOD	SLBS	PM	AT	CICSS
Quality Management Plan	I	**A**	C	C	I	**R**	C	C
Deliverables Acceptance Plan	I	**A**	C	I	I	**R**	**S**	C
Perform Quality Assurance	I	I	I	C	I	**A**	**S**	**R**
Perform Quality Control	I	I	I	C	I	**R**	C	C
Perform Deliverables Acceptance	I	I	**A**	C	I	**R**	**S**	C
Perform Final Acceptance	I	**A**	C	I	I	**R**	C	I

The contact details of each of the above stakeholders will be documented in the project stakeholder matrix.

Project quality approach and criteria are agreed upon by the Project Management Team. The PM is ultimately accountable for the correct and full completion of QA activities.

As a result, a project team member or an independent expert is appointed in the role of project auditor or reviewer. This individual can be someone internal to the organization or external as mentioned in the first statement.

The PM, supported by the Heads of Department (HOD) and Administrative Team (AT), is accountable for scheduling the acceptance activities and ensuring that they are performed as planned.

The PM is also responsible for performing QC throughout the project under the supervision of the MOE and SLBS.

The PO is accountable for deliverables and project acceptance and for ensuring the availability of resources and guidelines for acceptance testing.

4.6.4 QUALITY ACCEPTANCE CRITERIA

Chart 31: Quality Acceptance Criteria

(Source: Author of study)

Deliverables	Acceptance Criteria	Verification
Access to the internet within classrooms	100% students and staff are able to access the internet in laboratories and classrooms	Observational checklist
Infrastructure and resource development upgrades	Functioning infrastructure and resource development at 95% capacity	Inventory and technician reports
Trained teachers	Greater number of teachers trained in the use of and integration of ICT tools	Results of staff survey
Maintenance plan	Routine (fortnightly) hardware maintenance	Technician report
Training in the use of selected hardware and software	Point persons trained in the installation, configuration and use of various computer hardware and software based on the technical specification	Report of a Quality Checklist on the reliability of the hardware
Contracting of experts and	Consultants meet the experience and qualification	Fulfillment of the scope of work – Report of the training

specialists, i.e., ICT expert, IT technician and networking expert	requirements approved in the terms of reference.	sessions verified by the Education Specialist and Quality Assurance.

4.6.5 QUALITY METRICS AND MEASUREMENTS

The CICSS project team will maintain records that document assessments performed on the project. Maintaining these records will provide objective evidence and traceability of assessments performed throughout the project's lifecycle. The project team will use a shared document repository to contain the reporting data and the reports produced as part of the quality activities and reviews. The records will be maintained through the implementation phase of the project.

All CICSS project products and processes must be measured and fall within the established standards and tolerances. The tables below are examples of quality assurance and quality control logs that may be used by the CICSS project team to conduct these measurements. These logs will also be retained as supporting documentation.

4.6.5.1 MEASURING REPORTS

The CICSS project team will maintain records that document assessments performed on the project. Maintaining these records will provide objective evidence and traceability of assessments performed throughout the project's lifecycle. The project team

will use a shared document repository to contain the reporting data and the reports produced as part of the quality activities and reviews. The records will be maintained through the implementation phase of the project.

Chart 32: Quality Metrics and Measurements

(Source: https://www.tn.gov/content/dam/tn/finance/tbsm/TBSMQualityManagementPlan.docx.)

Quality Area	Metric	Measurement	Frequency	Threshold Tolerance
Change Control	Number of opened and closed change requests	Total new of change requests approved, rejected or deferred during the reporting period.	Weekly	No tolerance
Schedule	SPI	EV/PV		SPI must be one or greater, or else less work is being completed than the planned work. The means project is behind schedule.
Consultancies	Contractual deliverable timeliness	Number of deliverables submitted on time per reporting period	Monthly	No tolerance

Quality Area	Metric	Measurement	Frequency	Threshold Tolerance
Training	The number of persons participating in the training workshops	Guidelines and grading scale	Fortnightly	No tolerance

4.6.6 Quality Assurance

Quality assurance, which is focused on the project processes, provides confidence that the quality requirements can be fulfilled and helps ensure that the project processes used to manage and deliver the project's product or service are effective and being applied. In order to ensure quality, an iterative quality process will be used throughout the project life cycle. This iterative process includes measuring process metrics, analyzing process data, and continuously improving the processes.

To identify, assess, respond to, monitor, and control project quality, all CICSS stakeholders will be involved. The Project Manager will schedule regularly occurring meetings to review the findings of the quality assurance activities. In these reviews, an agenda item will include a review of project processes, any discrepancies and/or audit findings from the Quality Manager or other assigned project team owner, and a discussion on process improvement initiatives. These reviews, findings, and assessments should result in some form of process and/or product improvement. All process improvement efforts must be documented, implemented, and communicated to all team members as changes are made.

Chart 33: Sample Quality Assurance Log

(Source: https://www.tn.gov/content/dam/tn/finance/tbsm/TBSMQualityManagementPlan.docx.)

ID #	Review Date	Process Reviewed	Findings	Resolution	Date Resolved	Recommendation	Acceptable? (Y/N)

4.6.7 Quality Control

Quality control is focused on the products and deliverables of the project. It is the process of monitoring project deliverables to verify that the deliverables are of acceptable quality and are complete and correct, and includes the inspection, analysis, and actions required to ensure quality output. The CICSS Quality control process involves the following steps:

- Verifying, validating, and monitoring of work products to ensure the requirements for quality and scope of work are being fulfilled
- Inspecting deliverables and documentation and comparing these items to a standard of quality defined by the stakeholders of the project
- Verifying that both the user's requirements and technical specifications are met before and after the work product is approved and is promoted into a stable production environment
- Monitoring output of workflows progress, detecting problems and defects, and allowing for corrections prior to delivery of work products or services

The Project Manager will schedule regularly occurring project, management, and document reviews. In these reviews, an agenda item will include a review of products, any discrepancies and/or audit findings from the quality manager/quality reviewer, and a discussion on product improvement initiatives.

Chart 34: Sample Quality Control Log

(Source: https://www.tn.gov/content/dam/tn/finance/tbsm/TBSMQualityManagementPlan.docx.)

ID #	Review Date	Deliverable Reviewed	Findings	Resolution	Date Resolved	Recommendation	Acceptable? (Y/N)

4.7 RESOURCE MANAGEMENT PLAN

Resource Management Plan for the upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia.

PREPARED BY: YASMIN TYSON

DOCUMENT VERSION

Chart 35: Document Control Information

(Source: https://www.pm2alliance.eu/publications and www.ProjectManagementDocs.com)

Settings	Value
Document Title	Resource Management Plan
Project Title	Project Management Plan for the upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia.
Document Author	Yasmin A. Tyson
Project Owner (PO)	Ciceron Secondary School
Project Manager (PM)	Yasmin A. Tyson
Doc. Version	v1
Sensitivity	Public
Date	31/10/2022

Document Approver(s) and Reviewer(s):

Name	Role	Action	Date
		<Approve / Review>	

Abstract

The resource management plan lists all the resources required to complete the project successfully. The broad resources category for the project covers time, people, supplies and equipment. The development of the resource management plan is linked to the project budget and schedule which allows the project team to identify resource gaps. Additionally, the appropriate allocation of resources, to the project team, is also achieved through this plan. The resource management plan was developed and adapted based on templates retrieved from (*Resource Management Plan*, 2020), (2021, Project Resource Management Template, PM^2 Alliance http://pm2alliance.eu/publications) and (n.d., Resource management Plan Template, Project Management Docs. https://www.projectmanagementdocs.com/template/project-planning/human-resource-plan/)

Table of Contents

4.7.0 INTRODUCTION

The purpose of the resource management plan is to achieve project success by ensuring that the appropriate resources with the necessary skills are acquired for the Project team. Human resources need to be trained, obtained and if any gaps in skills are identified, team building strategies are clearly defined, and team activities are effectively managed. The resource management plan for this project includes time, people, supplies and equipment and its development is linked to the project budget and schedule, which allows the project team to identify resource gaps. If used effectively, this plan will serve as a tool to aid in the management of human resource activities throughout the CICSS project lifecycle.

This plan includes information regarding the following topics:

- Roles and responsibilities of team members throughout the project;
- Project organization charts;
- Budgetary allocations;
- Performance measurements; and
- Schedule baselines for each project phase.

4.7.1 RESOURCES ALLOCATED

Resource allocation is an important part of resource scheduling, that requires the scheduling of tasks and the associated resources (Landau, 2022). Landau (2022), further asserts that part of resource allocation is knowing the availability of your resources and scheduling them to coincide with your project timeline.

Chart 36: Resource Allocations

(Source: Author of study)

Resource Description	Location	Allocation
Project Management Team		
Project Manager	Internal	100% of time and effort
Project Sponsor Representative	External	100% of time and effort
Procurement Officer	External	100% of time and effort
Project Accountant	External	100% of time and effort
Quality Assurance Officer	Internal	100% of time and effort
Academic Liaison	Internal	100% of time and effort
TVET Coordinator	Internal	100% of time and effort
Project Administrative Assistant	Internal	100% of time and effort
Consultants and Technical Experts		
Technology Specialist - Curriculum	External	4 months
Information Technology consultant – hardware and software installation	External	4 months
Training expert	Internal	4 months
Networking Consultant	External	4 months
Training		
Training Materials	Internal	4 months
Training room	Internal	4 months
Training Equipment	Internal	4 months
Equipment		

Computer hardware and software	External	4 months
Digital surveillance equipment	External	4 months
Infrastructural equipment	External	4 months
Office supplies	External	4 months
Electronics	External	4 months
Telecommunications		
Telephone	Internal	Full time
Email, Drop box, Google documents – report development and transmission	Internal	Full time
Online communication software	Internal	Full time
Office Space		
Project team office space	Internal	Full time

4.7.2 RESOURCE REQUIREMENTS

Resource requirements identify the types and quantities of resources required for each work package or activity in a work package and can be aggregated to determine the estimated resources for each work package, each WBS branch and the project as a whole (PMI, 2017). Resource requirements are defined by the project manager to establish the resources needed to execute the work on the project. Chart 37 below outline the resource requirements for the CICSS project.

After the activities are defined, the resources needed for the project will be determined, through a process called “identifying the resource requirements”. Resources can be physical

or human resources and resource requirements determine the type and quantity of resources that are needed for an activity. Usually, the lowest level of the WBS is considered and the resource requirements of a work package is identified. These requirements are then combined to determine the resource requirements of the higher level of activities and, ultimately, the overall project.

Chart 37: Project Resource Requirements

(Source: Author of study)

Resource Description	**Skills Level**	**Associated Task(s)**	**Duration and time required**	**Level of Risk (H,M,L)**
Project Management Team				
Project Manager	5	Manage the overall implementation of the project	100% of time and effort	High
Project Sponsor Representative	3	Review, approve and accept project deliverables	50% of time and effort	High
Procurement Officer	5	Responsible for procurement logistics	100% of time and effort	High
Project Accountant	4	Responsible for all project-related payments, budget and cost estimates	100% of time and effort	High
Quality	4	Responsible for	100% of time	High

Assurance Officer		the management of the quality component of the project and training	and effort	
Academic Liaison	3	Responsible for the curriculum integration and spearheads audit	100% of time and effort	High
TVET Coordinator	3	Responsible for the curriculum integration and spearheads audit	100% of time and effort	High
Project Administrative Assistant	2	Administrative support to the project team	75% of time and effort	Medium
Consultants and Technical Experts				
Technology Specialist - Curriculum	5	Responsible for the development and supervision of the technology integration	4 months	High

		process		
Information Technology consultant – hardware and software installation	5	Set up and install hardware and software for training and use by beneficiaries	4 months	High
Training expert	5	Responsible for the development of training materials and execution of the training plan	4 months	High
Networking Consultant	5	Responsible for the set up and update of network infrastructure	4 months	High
Training				
Training Materials	Prepare and print according to outlined specifications	Training materials will be collated by training expert	4 months	High

		as part of the consultancy		
Training room	Functional	Execution of project activities	3 months	Medium
Training Equipment	Functional	Execution of project activities	3 months	High
Equipment				
Computer hardware and software	According to specifications	Execution of project activities	4 months	High
Digital Surveillance equipment	According to specifications	Execution of project activities	4 months	High
Infrastructural equipment	According to specifications	Execution of project activities	4 months	High
Office supplies	According to specifications	Execution of project activities	4 months	High
Electronics	According to specifications	Execution of project activities	4 months	High
Telecommunications				
Telephone	Functional	Execution of project activities	Full time	High

Email, Drop box, Google docs – report development and transmission	Functional	Execution of project activities	Full time	High
Online communication software	Functional	Execution of project activities	Full time	High
Office Space				
Project team office space	Functional	Working space	Full time	Low

Key

Skills Level Scale

5 Expert	4 Specialist	3 Professional	2 Skilled	1 Semi-Skilled

Level of Risk

H High	M Medium	L Low

Chart 38: Priority Levels

(Source: https://www.projectmanagementdocs.com/#axzz7iwbJ2RF2)

Priority Level	Definition
High	These requirements are mission critical. They are required for project/product success or for progression to next project phase
Medium	These requirements support product/process operations but can be completed under the next product release
Low	These requirements are quality and/or functional enhancements and are not desirable if time and resources permit

4.7.3 BASIS OF ESTIMATES

The amount and type of additional details supporting the duration estimate vary by application area. Regardless of the level of detail, the supporting documentation should provide a clear and complete understanding of how the duration estimate was derived (PMI, 2017). According to the PMI (2017), the supporting detail for duration estimates may include:

- Documentation of the basis of the estimate (how it was developed);
- Documentation of all assumptions made;
- Documentation of any known constraints;
- Indication of the range of possible estimates (±10%) to indicate that the duration is estimated between a range of values);
- Indication of the confidence level of the final estimate; and
- Documentation of individual project risks influencing this estimate.

The project manager and procurement officer will conduct meetings with internal and external stakeholders to receive input on the resources needed, i.e., the skills level, quantity and quality of materials for the project for the basis of estimates.

4.7.4 RESOURCE BREAKDOWN STRUCTURE

A resource breakdown structure (RBS) is a hierarchical outline of the resources needed to deliver a project. Project managers typically use it to create a complete list of resources needed, while estimating costs and timeframes.

Viter (2022), states that an RBS can help you and your team to:

- Plan for the resources you will need to deliver a successful project;
- Identify missing resources and develop strategies for sourcing them;
- Identify risks associated with acquiring required resources;
- Manage budgets, to know how much money is being spent; and
- Give stakeholders confidence in your ability to meet project deadlines.

Below in figure 29 is the RBS for the CICSS project.

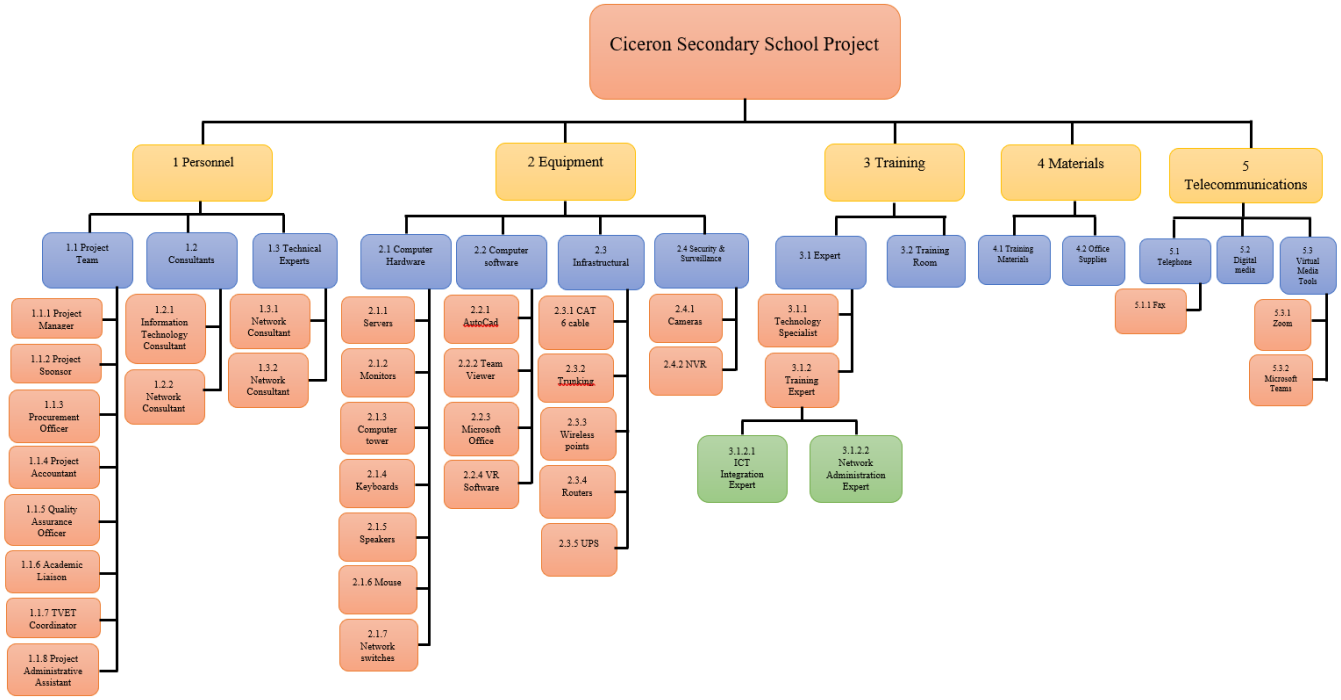


Figure 29: Resource Breakdown Structure

(Source: Author of study)

4.7.5 ACQUIRE RESOURCES

Acquire resources is the process of obtaining team members, facilities, equipment, materials, supplies and other resources necessary to complete project work (PMI, 2017). The resources can either be internal or external to the organization that is performing the project. Internal resources are assigned by the functional or resource managers while external resources are acquired or leased through procurement process. The project manager, in collaboration with the sponsor, would assign the internal resources. The external resources would be acquired through the procurement process which is guided by the procurement officer.

A resources calendar will be used to determine the period that each resource would be required for the project. The use of the calendar will be linked to the project schedule. The Acquire Resources process will be performed at periodic intervals throughout the project lifecycle and will help in preventing the exhaustion or depletion of resources.

4.7.6 PROJECT TEAM ASSIGNMENTS

The following organizational chart illustrates the reporting structure and responsibilities of team members relative to the project tasks.

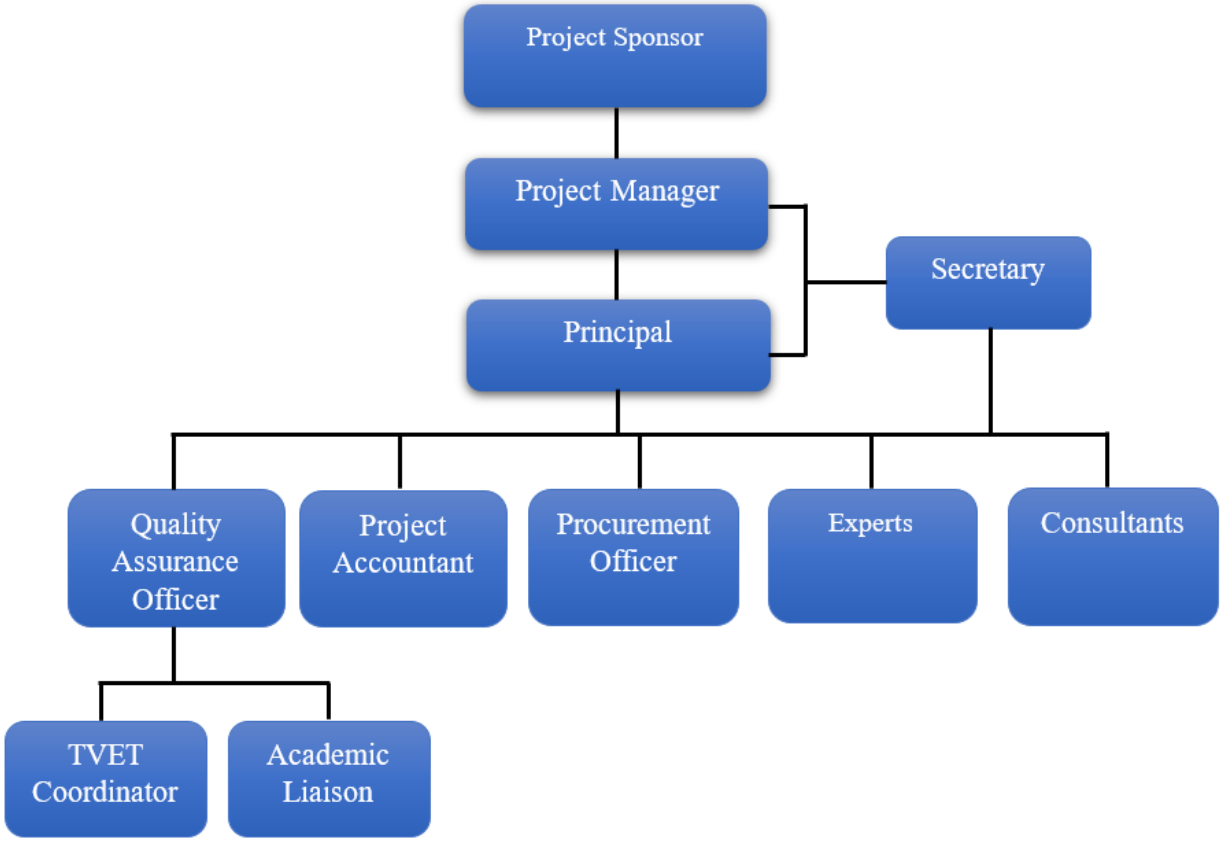


Figure 30: Organizational Chart

(Source: Author of study)

The following RACI chart (Chart 39) shows the relationship between project tasks and team members. Any proposed changes to project responsibilities must be reviewed and approved by the project manager. Changes will be proposed in accordance with the project's change control process. As changes are made, all project documents will be updated and redistributed accordingly.

Chart 39: RAM (RACI)

(Source: Author of study)

Roles / Project Tasks	Project Sponsor	Project Manager	Procurement Officer	Project Accountant	Quality Assurance Officer	Academic Liaison	TVET Coordinator	Project Secretary
Project Planning	A	A	R	C	I	C	C	I
Project Management	A	A	R	R	C	I	I	I
Procurement	C	R	A	C	C	I	I	I
Project Launch	A	R	I	I	I	I	I	I
Training	I	R	C	C	I	R	R	I
Infrastructure Preparation	C	R	C	C	R	I	I	I
Implementation Hardware Testing	C	R	A	R	R	C	C	I
Installations Software Testing	C	R	A	A	R	C	C	I
Project Closure	A	R	R	R	R	R	R	I

RACI Definition Key

Responsible (R) The responsible person is the one who does the work to complete the task or create the deliverable.

Accountable (A) The accountable person delegates and reviews the work involved in a project and ensures that the responsible person(s) or team know the expectations of the project and complete work on time. They are accountable for ensuring task completion and sign off.

Consulted (C) The consulted parties may be individuals on the project team who are not working on a given task but whose work will be affected by the outcome. They are consulted before any decisions are made.

Informed (I) The informed persons need to be looped into the progress of a project (when an action or decision has been made) but not consulted or overwhelmed with the details of every task. They need to know what is going on because it could affect their work, but they are not decision makers in the process.

4.7.7 TEAM DEVELOPMENT AND PERFORMANCE MEASURE

Develop Team is the process of improving competencies, team member interaction and overall team environment to enhance project performance (PMI, 2017).

The process of developing project team is associated with teamwork management and incorporates all team building factors such as cultural diversity, team climate and global environment. Teamwork management and team building should be organized and

implemented in the context of clearly and timely stated communication between team members throughout the project lifecycle.

The day-to-day management of the project staff for this project is the responsibility of the project manager and team leaders. Performance evaluations and performance issues and recognition are the responsibility of the project manager. So, a project manager needs to use multiple leadership approaches throughout the lifecycle of a project. The project manager also completes formal and informal team performance assessments to develop the project team and enhance the overall effectiveness of the team.

Staff Training

Training opportunities for team members help improve their skills and decrease overall project cost and schedule by increasing efficiency. Conducting training is a cost to the project which should be paid by the project and documented in the human resource plan.

When new staff join the project, the project manager (or delegated project staff) will provide a project orientation. The orientation will include discussions related to the following topics:

- Background of the project;
- Current status of the project;
- Specific job duties and expectations;
- Introduction to the staff and consultants;

- Overview of the facility and infrastructure; and
- Overview of the project processes, including time reporting, attendance and status meetings.

Performance Reviews

The project manager will review each team member's assigned work activities at the onset of the project and communicate all expectations of work to be performed. The project manager will then evaluate each team member throughout the project to assess their performance and overall work efficiency level. Prior to releasing project resources, the project manager will meet with the appropriate team leaders and provide feedback on team member's project performance. The project manager will then perform a formal performance review with each team member.

Recognition and Rewards

Although the scope of this project does not allow for monetary rewards, there are several planned recognition and reward items for project team members. The project manager will work with appropriate staff to identify potential opportunities and tools for creative recognition and rewards. Suggested Rewards include, upon successful completion of the project:

- Celebration of the success of each team member; and
- Distribution of certificate of thanks, from the project sponsor, to any team member who satisfactorily completes all assigned work packages on time.

4.7.8 CONTROL RESOURCES

Control Resources is the process of ensuring that the physical resources assigned and allocated to the project are available as planned, as well as monitoring the planned versus actual utilization of resources and taking corrective action, as necessary (PMI, 2017). Control Resources is performed throughout the project lifecycle.

The CICSS project will use performance reviews as the control resources technique to measure the planned resource utilization against the actual resources being utilized. Results will be used to identify any issues that are being encountered which can affect project performance. Control Resources will follow the processes outlined below:

- Monitoring resource expenditures–this process will be monitored by the project accountant and project manager;
- Identifying and dealing with resource shortage or surplus in a timely manner–this is the responsibility of the project manager, procurement officer and project accountant;
- Ensuring that resources are used and released according to the plan and project needs–this is the responsibility of the project manager and procurement officer;
- Informing appropriate stakeholders if any issues arise with relevant resources–this process will be undertaken by the project manager;
- Influencing the factors that can create resource utilization change–this is the responsibility of the project manager; and
- Managing the actual changes as they occur–this is the responsibility of the project manager and quality control officer.

The outputs from this process will provide updates to the overall resource plan as well as the risk and issue logs.

4.8 COMMUNICATIONS MANAGEMENT PLAN

Communication Management Plan for the upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia.

PREPARED BY: YASMIN TYSON

DOCUMENT VERSION

Chart 40: Document Control Information

(Source: https://www.pm2alliance.eu/publications and www.ProjectManagementDocs.com)

Settings	Value
Document Title	Communication Management Plan
Project Title	Project Management Plan for the upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia.
Document Author	Yasmin A. Tyson
Project Owner (PO)	Ciceron Secondary School
Project Manager (PM)	Yasmin A. Tyson
Doc. Version	v1
Sensitivity	Public
Date	11/112022

Document Approver(s) and Reviewer(s):

Name	Role	Action	Date
		<Approve / Review>	

Abstract

Communication facilitates discussion, understanding and decision making which provide direction to drive progress. The purpose of the communications management plan is to define the communication requirements for the project and how information will be distributed. The plan was developed based on a template retrieved from https://www.pmalliance.eu/publications and (n.d., Communications Management Plan Template, Project Management Docs. https://www.projectmanagementdocs.com/template/project-planning/communications-management-plan/)

Table of Contents

4.8.0 INTRODUCTION

The communications management plan determines how to communicate most efficiently and effectively with the various stakeholders. It defines and documents the communication items content, format, frequency, the audience and expected results. It also defines how to communicate project status and the assignment of activities to the various stakeholders, and the communication strategy for each stakeholder, based on their interests, expectations and influence in the project.

4.8.1 COMMUNICATION MANAGEMENT APPROACH

The project manager will take a proactive role in ensuring effective communication practice on this project. The communications requirements are documented in the subsequent communications matrix and it will serve as the guide for what information is to be communicated, team member communication responsibilities, communication scheduling and target audience details.

As with most project plans, updates or changes may be required as the project progresses or changes are approved. Changes or updates may be required due to changes in personnel, scope, budget or other reasons. Additionally, updates may be required as the project matures and additional requirements are needed. The project manager is responsible for managing all proposed and approved changes to the communications management plan. Once the change is approved, the project manager will update the plan and supporting documentation, and will distribute the updates to the project team and all relevant stakeholders. This methodology is consistent with the project's change management plan

and ensures that all project stakeholders remain aware and informed of any changes to communications management.

Figure 31: 5 W's And 1 H's Of Effective Communication

(Source: https://business.adobe.com/blog/basics/project-management-101-the-5-ws-and-1-h-that-should-be-asked-of-every-project#:~:text=The%20Five%20Ws%2C%20Five%20Ws,often%20mentioned%20in%20journalism%20(cf.)

4.8.2 COMMUNICATION OBJECTIVES

The overall objective of a communications management plan is to promote the success of a project by meeting the information needs of project stakeholders and outlining the goals of all communication efforts to reach and inform each group. Further, the specific objectives of the communications management plan for this project are as follows:

- To establish open and collaborative communication among all stakeholders;
- To provide opportunities to give and receive feedback to stakeholders and project team;

- To foster a supportive environment within the project and among stakeholders;
- To circulate accurate and timely information about the project;
- To ensure that the various communication media are utilized effectively throughout the project lifecycle;
- To use the most efficient communication tools and techniques;
- To increase the knowledge and understanding of the benefits and importance of the project;
- To ensure smooth information flow within the project team;
- To ensure adoption of the responsibilities and actions assigned to each role; and
- Reduce negative effects of rumours and/or misinformation about the project in the stakeholder populations.

4.8.3 COMMUNICATIONS MANAGEMENT ASSUMPTIONS

This communication management assumptions include:

- NTRC and MOE will provide the necessary support to develop and execute the communications plan;
- Timely and consistent communication will be practiced among the project team members and key stakeholders;
- Efficient and effective communication tools and techniques will be utilized throughout the project lifecycle; and
- All the necessary resources to implement and execute the communication management plan will be available and accessible in a timely manner throughout the project lifecycle.

4.8.4 STAKEHOLDER COMMUNICATIONS REQUIREMENTS

Chart 41: Roles and Responsibilities

(Source: Author of study)

Roles	Responsibilities
Project Manager	• Identify project communication needs • Create and reviews project communications • Publish and distributes project communications • Create project status reports and post to project online collaboration site • Add communication activities to project workplan, as needed • Track communication activities in the project workplan to ensure timely completion • Report on project status • Facilitate project core team, project team, sponsors and steering committee meetings and provides meeting minutes • Report on project status at various stakeholder group meetings • Monitor project email inbox as a backup to the implementation lead.

Communications Lead	• Draft communications management plan • Create and reviews project communications • Publish and distributes project communications • Keep project manager informed about project communication activities • Identify and manages stakeholder communication needs, monitor project email box, schedule and facilitate meetings with identified stakeholders, provides next steps • Prepare project updates • Maintain project collaboration site • Attend and reports on project activities at various stakeholder group meetings
Project Communication Team	• Identify project communication needs • Create project communications, when needed • Review project communications, when needed
Unit Manager	• Identify project communication needs • Review and approves project communications
Sponsors	• Identify project communication needs

	• Create project communications, when needed • Review project communications, when needed
Project Team	• Keep project manager informed about project activities • Provide content for some project communications • Review project communications, when needed

The communication requirements are listed in Chart 42 below and are derived based on guidance from stakeholders identified in the stakeholder register.

Chart 42: Stakeholder Communications Requirements

(Source: Author of study)

Stakeholder	Role	Contact Information	Communication Type
NTRC	Sponsor	758 458 2035	Status reports, emails, face-to-face meetings, media presentations, online project meetings, focus group meetings
Yasmin Tyson	Project Manager	758 452 5367	Status reports, emails, face-to-face meetings, media presentations, online project meetings, focus group meetings
MOE appointee	Consultant/ Experts	758 721 7815	Status reports, emails, face-to-face meetings, media presentations, online project meetings, focus groups meetings
NTRC appointee	Project Accountant	758 458 2035	Status reports, emails, face-to-face meetings, media

Stakeholder	Role	Contact Information	Communication Type
			presentations, online project meetings, focus groups meetings
NTRC appointee	Procurement Officer	758 458 2035	Status reports, emails, face-to-face meetings, media presentations, online project meetings, focus groups meetings
NTRC appointee	Project Accountant	758 458 2035	Status reports, emails, face-to-face meetings, media presentations, online project meetings, focus groups meetings
Principal	Liaison	758 452 5367	Status reports, emails, face-to-face meetings, media presentations, online project meetings, focus groups meetings
CICSS appointee	TVET Coordinator	758 452 5367	Status reports, emails, face-to-face meetings, media presentations, online project meetings, focus groups meetings
CICSS appointee	Academic Liaison	758 452 5367	Status reports, emails, face-to-face meetings, media presentations, online project meetings, focus groups meetings
NTRC & CICSS appointee	Quality Assurance Officer	758 458 2035	Status reports, emails, face-to-face meetings, media presentations, online project meetings, focus groups meetings

4.8.5 PROJECT COMMUNICATION FRAMEWORK

The development of a communication management plan is an essential element of a project. It aligns the communication strategies with all stakeholders. The project manager has to ensure that all the accurate and complete information gets to the proper channels by establishing a framework which is a plan that allows for efficient communication with the project team, stakeholders and executives. This means that the project manager and the project team will agree on who communicates, what, to whom, when and how.

The following should be taken into consideration when formulating the strategic plan:

- Stakeholders, both internal and external;
- Urgency of the need for information. The urgency, frequency and format of the information to be communicated and within different phases of a project;
- Project environment. Whether the team will meet and operate on a face-to-face basis or in a virtual environment and the physical location of the project team members and stakeholders;
- Availability and reliability of technology. The technology that is required for distribution of project communications documents should be compatible, available and accessible for all stakeholders throughout the project;
- Ease of use. The choice of communication technologies should be suitable for project participants and proper training events should be planned, where appropriate. The language of communication is simple, clear and unambiguous; and

- The knowledge management repository of the organization is kept updated, accurate and accessible. Knowledge management is the ability of a business to capture information, share it and apply it effectively.

The CICSS project's success is dependent upon excellent communication practices among stakeholders and project team members. As a result, three (3) methods of communication will be used in the CICSS project.

Firstly, the interactive model of communication will be used in this project and Tiwari (2022), explains it as a method of communication in which the sender and receiver exchange ideas, messages and information within physical and psychological contexts. An interactive model of communication is defined as an exchange of ideas, information or message from a sender to a receiver and vice versa.

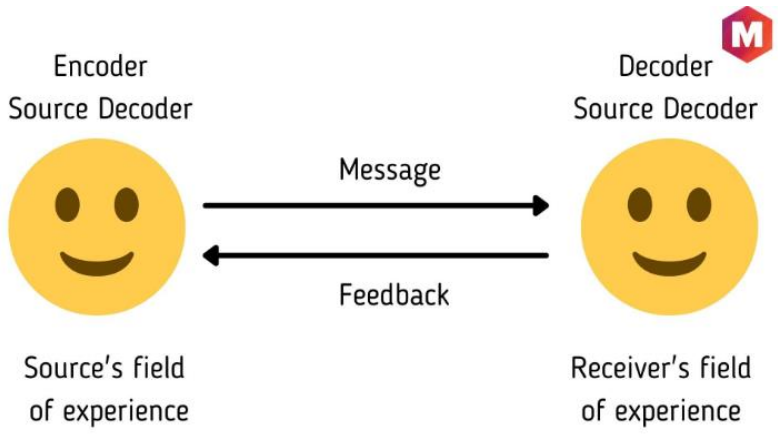


Figure 32: Interactive Model of Communication

(Source: https://www.marketing91.com/interactive-model-of-communication/)

Examples of Interactive communication used in the CICSS project include any face-to-face contact, such as meetings, phone and video calls and conferencing, and push communication.

Secondly, push communication is communication that is delivered by the sender to recipients. While the communication can be confirmed that it was sent, it does not necessarily mean it was received and understood. This type of communication is necessary as it includes memos, emails, status reports, voice mail, faxes and letters. It is not face-to-face communication, but is typically done through some written medium. Push communication is used for one-way communication with individual stakeholders or groups of stakeholders. It, however, inhibits the ability to immediately gauge reaction and assess understanding, so it should be used deliberately. The CICSS project will use push communication when the recipients need the information, but it does not require an immediate response and the communication is non-urgent or sensitive in nature.

Thirdly, pull communication is a communication method that provides access to the information; however, the receiver must proactively retrieve the information. Pull communication should be used when the communication is informational in purpose. Notably, if the recipients do not read it, it will not affect the project, but pull communication information is traditionally sought by the stakeholder, e.g., a project team member going to an intranet to find communication policies or templates, running internet searches and using online repositories or bulletin boards. Pulling information is used for indirect sensing of stakeholder concerns.

Figure 33 provides a summary of the three (3) communication methods that will be utilized in this project.

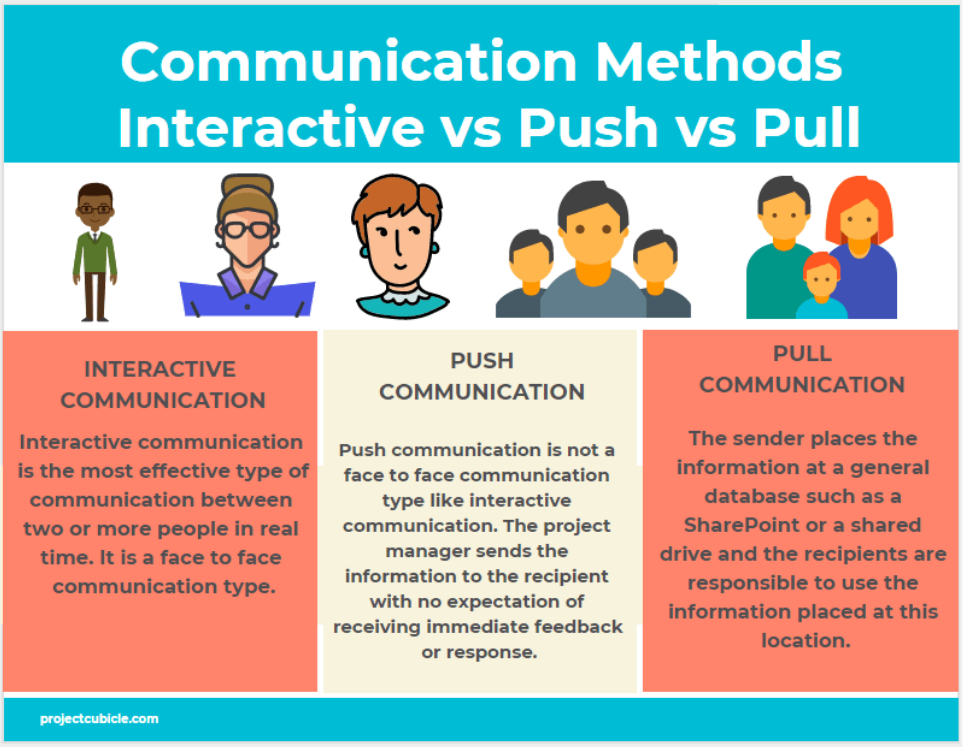


Figure 33: Summation of Communication Methods

(Source: http://www.projectcubicle.com)

Chart 43: Project Communication Requirements

(Source: http://www.projectmanagementdocs.com)

Communication Type	Objective of Communication	Medium	Frequency	Audience	Owner	Deliverables	Format
Kickoff Meeting	• Introduce the project team and the project • Review project objectives and management approach	• Face-to-Face	Once	• Project Sponsor • Project Team • Stakeholders	Project Manager	• Agenda • Meeting Minutes	• Hard copy provided at the meeting • Soft copy emailed and available in Google

							Docs
Project Team Meetings	• Review status of the project with the team	• Face-to-Face • Conference Call • Zoom	Weekly	• Project Team	Project Manager	• Agenda • Meeting Minutes • Project schedule	• Hard copy provided at the meeting • Soft copy emailed and available in Google Docs

Layout and Design Meetings	• Discuss and develop network and infrastructural design solutions for the project	• Face-to-Face	As Needed	• Project Technical Staff	Technological Lead	• Agenda • Meeting Minutes	• Hard copy provided at the meeting • Soft copy emailed, available in Google Docs and Dropbox
Monthly Project Status Meetings	• Report on the status of the	• Face-to-Face	Monthly	• Project Sponsor	Project Manager	• Document updates	• Hard copy

	project to management	• Conference Call • Zoom		• Project Team • Stakeholders • MOE		• Project schedule	provided at the meeting • Soft copy emailed, available in Google Docs and Dropbox
Project Status Reports	• Report the status of the project including activities,	• Email	Monthly	• Project Sponsor • Project Team • Stakeholders	Project Manager	• Project Status Report • Project schedule	• Hard copy provided at the

	progress, costs and issues			• MOE			meeting • Soft copy emailed, available in Google Docs and Dropbox

4.8.6. COMMUNICATION ESCALATAION PROCESS

Efficient and timely communication is key to successful project completion. As such, it is imperative that any disputes, conflicts or discrepancies, regarding project communications, are resolved in a way that is conducive to maintaining the project schedule, ensuring the correct communications are distributed and preventing any ongoing difficulties. In order to ensure that the CICSS project stays on schedule and issues are resolved, a standard escalation model will be utilized to provide a framework for escalating communication issues. The Chart 44 below defines the priority levels, decision authorities and timeframes for resolution.

Chart 44: Escalation Matrix

(Source: http://www.projectmanagementdocs.com)

Priority	Definition	Decision Authority	Timeframe for Resolution
Priority 1	Major impact to project or business operations. If not resolved quickly there will be a significant adverse impact to revenue and/or schedule.	Project Manager and Project Sponsor	Within 24 hours
Priority 2	Medium impact to project or business operations which may result in some adverse impact to revenue and/or schedule.	Project Manager and Project Sponsor	Within 5 business day
Priority 3	Slight impact which may cause some minor scheduling difficulties with the	Project Manager	Within 7 business days

	project but no impact to business operations or revenue.		
Priority 4	Insignificant impact to project but there may be a better solution.	Project Manager	Work continues and any recommendations are submitted via the project change control process

Chart 45: Glossary of Communication Terminology

(Source http://www.projectmanagementdocs.com)

Term	Definition
Communication	The effective sending and receiving of information. Ideally, the information received should match the information sent. It is the responsibility of the sender to ensure this takes place.
Stakeholder	Individuals or groups involved in the project or whose interests may be affected by the project's execution or outcome.
Communications Management Plan	Portion of the overall PMP which details how project communications will be conducted, who will participate in communications, frequency of communications and methods of communications.
Escalation	The process which details how conflicts and issues will be passed up the management chain for resolution as well as the timeframe to achieve resolution.

4.8.7 MONITOR COMMUNICATION

Monitor Communications is the process of ensuring the information needs of the project and its stakeholders are met (PMI, 2017). The project manager needs to control the flow of communication and the information shared in the communication. The Monitor Communications process makes sure that every stakeholder gets the information he or she is supposed to get, at the time the individual or group is expecting it and using the method the individual or group is supposed to get it by, as defined in the communication plan and stakeholder management plan. The CICSS project manager's approach to tracking the project's progress will be collaborative, transparent and timely.

Expert judgment is a necessary component in the communication monitoring process. The effectiveness of communication and the accessibility to the stakeholders will be monitored by the communication specialist under the guidance of a communications expert. This will ensure that stakeholders and or project managers communicate effectively sending or receiving:

- the right messages (including accuracy);
- the right impact;
- at the right time;
- to the right people;
- at the right place;
- the right level of detail;
- using the right medium, format and distribution method;
- with the right formality;

- considering confidentiality;
- for the right reason; and
- at the right cost.

Checklists will be utilized to ensure that all areas are covered by the sender and relevant matters are addressed, and that the stakeholders and project team receive the information that pertains to their tasks.

Stakeholder engagement audits will be performed to ensure that risks are being managed, reports are being documented as agreed upon, recommendations are being acted upon and the flow of communication remains unclogged by bureaucracy. The audit would measure the frequency, mode, satisfaction, audience and changes experienced by communication actions, activities and processes. These audits will be performed at stipulated times and intervals along with a stakeholder satisfaction survey and team check-ins.

Meetings will be conducted face-to-face and or virtually in the decision making, responding to stakeholder requests and having discussions with suppliers, vendors and other project stakeholders. Dependent on the phase of the project, frequency and duration of meetings will be determined by the communication specialist and the project manager. Meetings will follow set guidelines stated in the following sub-sections.

4.8.7.1 MEETING AGENDA

Meeting agenda will be distributed at least one (1) business day in advance of the meeting. The agenda will identify the presenter for each topic along with a time limit for that topic. The first item in the agenda should be a review of action items from the previous meeting.

4.8.7.2 MEETING MINUTES

Meeting minutes or notes will be distributed within two (2) business days following the meeting. Meeting minutes or notes will include the status of all items from the agenda along with new action items.

4.8.7.3 ACTION ITEMS

Action items are recorded in both the meeting agenda and minutes. Action items will include both the action item and the owner of the action item. Meetings will start with a review of the status of all action items from previous meetings and end with a review of all new action items resulting from the meeting. The review of the new action items will include identifying the owner for each action item.

4.8.7.4 MEETING CHAIR PERSON

The Chairperson is responsible for distributing the meeting agenda, facilitating the meeting and distributing the meeting minutes. The Chairperson will ensure that the meeting starts and ends on time and that all presenters adhere to their allocated timeframes.

4.8.7.5 NOTE TAKER

The note taker is responsible for documenting the status of all meeting items and taking notes of other important matters during the meeting. The note taker will give a copy of their notes to the chairperson at the end of the meeting as the chairperson will use the notes to create the meeting minutes.

4.8.7.6 TIME KEEPER

The time keeper is responsible for helping the facilitator adhere to the time limits set in the meeting agenda. The time keeper will let the presenter know when they are approaching the end of their allocated time.

Chart 46: Meeting Template

(Source: https://www.pm2alliance.eu/publications)

MEETING	Name of Meeting
PURPOSE	
LOCATION	
FREQUENCY	
CHAIRPERSON	
MINUTES BY	
ATTENDEES	
AGENDA ITEMS	
DISTRIBUTION LIST	
MEDIA	

4.8.7.7 CHANGE CONTROL

Changes to the communication management plan throughout the project lifecycle will be evident as project dynamics change or shift. As a result, changes should be documented and a process followed whereby these changes are logged and reviewed by the change control committee within the NTRC. Consultations with the project team and feedback from stakeholders will encompass the change request as the impact on the project's budget, schedule, quality, and scope has to be determined before final decisions are made by the Change Control Committee.

4.9 RISK MANAGEMENT PLAN

Risk Management Plan for the upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia.

PREPARED BY: YASMIN TYSON

DOCUMENT VERSION

Chart 47: Document Control Information

(Source: www.ProjectManagementDocs.com)

Settings	Value
Document Title	Risk Management Plan
Project Title	Project Management Plan for the upgrade of existing technological infrastructure, resources and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia.
Document Author	Yasmin A. Tyson
Project Owner (PO)	Ciceron Secondary School
Project Manager (PM)	Yasmin A. Tyson
Doc. Version	v1
Sensitivity	Public
Date	17/11/2022

Document Approver(s) and Reviewer(s):

Name	Role	Action	Date
		<Approve / Review>	

Abstract

The purpose of the document is to outline the risk management approach for the project. The plan specifies the methodology, standards, tools and techniques used to develop and support risk management. The plan also defines the risk monitoring and escalation processes taking into account the risk response actions. The risk management plan was developed based on a template retrieved from (2021, Risk Management Template, PM^2 Alliance http://pm2alliance.eu/publications), (n.d., Risk Management Plan Template, Project Management Docs. https://www.projectmanagementdocs.com/template/project-planning/risk-management-plan/) and (2022, Risk Management Plan Template, Tennessee State Government, https://www.tn.gov/content/dam/tn/finance/tbsm/TBSMRiskManagementPlan.docx

Table of Contents

4.9.6 Risk Registry

4.9.7 Control or Monitor Risk

4.9.0 INTRODUCTION

This risk management plan establishes the process for implementing proactive risk management as part of the overall management of CICSS project. The purpose of risk management is to identify potential problems before they occur, so that risk-handling activities may be planned and invoked as needed across the life of the project to mitigate adverse impacts on achieving objectives.

Risk management is a continuous, forward-looking process that addresses issues that could endanger achievement of critical objectives, and includes early and aggressive risk identification through the collaboration and involvement of relevant stakeholders. The risk management approach is tailored to effectively anticipate and mitigate the risks that have critical impact on project objectives.

While technical issues are a primary concern, both early on and throughout all project phases, risk management considers both internal and external sources for cost, schedule and technical risk. Early and aggressive detection of risks are a CICSS project objective, because it is typically easier, less costly and less disruptive to make changes and correct work efforts during the earlier phases of the project. This RMP describes the process to:

- Identify risk events and risk owners;
- Evaluate risks with respect to likelihood and consequences;
- Assess the options for the risks and develop mitigation plans;
- Track risk mitigation efforts; and

- Conduct periodic reassessments of project risks.

The risk management plan should be updated, as necessary, so identified risks will be tracked until they are retired.

4.9.1 RISK MANAGEMENT OBJECTIVES

The main objectives of project risk management are:

- To identify and assess project risks;
- To report all risks to the project management team;
- To ensure that risk response strategies are in-line with approved risk level thresholds;
- To effectively implement the appropriate risk response measure; and
- To ensure that all risks are monitored and controlled.

4.9.2 RISK MANAGEMENT PROCESS

The project risk management process defines the activities to identify, assess, prioritize, manage and control risks that may affect the execution of the project and the achievement of its objectives.

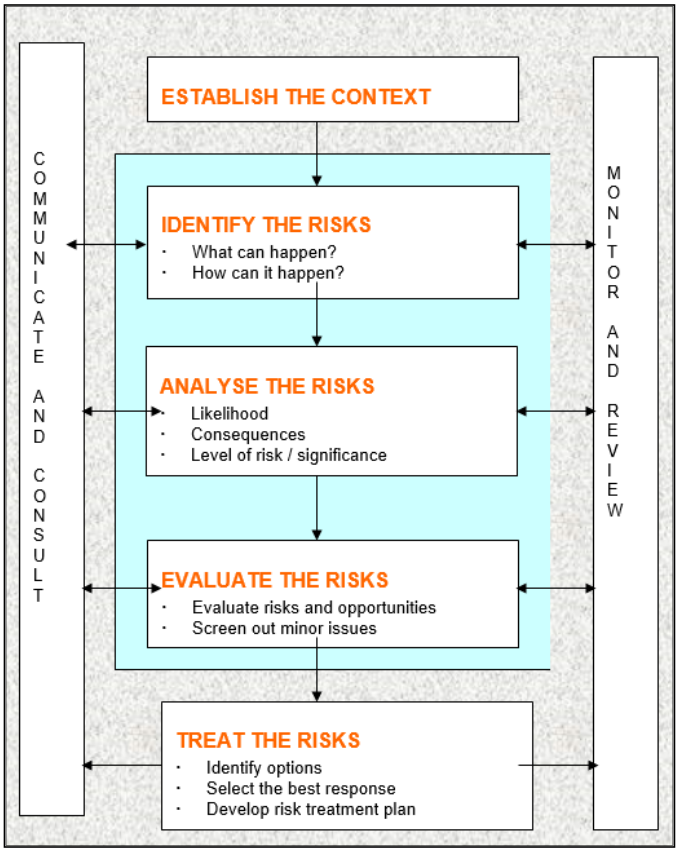


Figure 34: Risk Management Process

(Source: https://www.education.vic.gov.au/hrweb/Documents/OHS/riskassessmenttemplate.docx)

This risk management process comprises four (4) steps and they will be discussed herein.

Step 1: Risk Identification

Risk identification will involve the support of the CICSS project team, and appropriate stakeholders, and will include an evaluation of environmental factors, organizational culture and the PMP, especially the project scope, schedule, cost and quality considerations. Careful attention will be given to the project deliverables, assumptions,

constraints, WBS, cost and or effort estimates, resource plan and other key project documents.

To complement these efforts, some methods will be used to assist in the identification of risks associated with the CICSS project including:

- Expert Interviews;
- Risk Assessment Meetings;
- Historical Reviews of Similar Projects;
- Brainstorming;
- Interviewing;
- SCOT (Strengths, Challenges, Opportunities and Threats); and
- Diagramming.

The Risk Register will be updated as needed and will be stored electronically in the project library located at the NTRC.

Risks will be continuously identified throughout the project lifecycle; however, very early during the initiation phase, an initial risk list will be created and it will thereafter be frequently updated. The same process will be followed for the creation of the risk log and its appropriate population later on in the project.

Chart 48: Risk Log

(Source: https://www.pm2alliance.eu/publications)

Risk Identification and Description	
ID	The risk identifier
Category	Risk category related to the area affected by the risk
Title	A short title that is assigned to the risk.
Description	A description of the risk, i.e., its causes, the kinds of problems that it could result in (potential effects) and risk dependencies.
Status	The risk status can be any of the following: **Proposed** refers to the initial risk status and is used while the risk is still being specified; **Assessing** is used to initiate an assessment; **Waiting for Approval** use this to request approval for proposals. Before doing this, make sure that the assessment is complete and that the estimates are reliable; **Approved** status is set once the risk possibility has been accepted; **Rejected** status is set if the risk was rejected for not being relevant; and **Closed** status is set once the risk has been managed, e.g., mitigation actions were implemented, and it is not a risk for the project anymore.
Identified by	The person who identified the risk.

Identification date	The date on which the risk was identified.
Risk Assessment	
Likelihood (L)	A numerical value denoting the estimate of the probability that the risk will occur.
Impact (I)	A numerical value denoting the severity of the risk's impact should it occur.
Risk Level (RL)	The risk level is the product of the likelihood and impact, i.e., RL = L*I.
Risk owner	The person accountable for managing and monitoring the risk.
Escalation	Whether or not the risk is to be increased (**Yes** or **No)**.

Risk Response	
Risk response strategy	The possible strategies to deal with identified (negative) risks are: - risk avoidance, i.e., which is modifying the project or project plan to eliminate the conditions or activities that introduce the risk; - risk mitigation or reduction, i.e., which is the proactive implementation of risk reduction activities; - risk acceptance, i.e., which is the development of contingency plans in case the risk occurs (also called active acceptance); and - risk transfer or sharing, with other entities, e.g., through insurance and subcontracting.
Action details (effort and responsibility)	Description of the mitigation action(s), including its objective, scope, deliverables, the person responsible for the response and estimated effort needed.
Target Date	The date by which the action is expected to be implemented.

Step 2: Risk Assessment

Risk assessment will involve the assessment of the likelihood and impact of the identified risks, in terms of their influence to the project objectives. This assessment is necessary before any risk response planning can be done.

Risks will be assessed based on their likelihood of occurrence and possible impact on project objectives. The product of their likelihood and impact will define their RL, which is then used as a reference for their prioritization and appropriate risk response development.

Depending on the stakeholders' risk appetite, evaluation scales and tolerances will be defined and the most appropriate risk response strategies will be chosen. In order to determine the severity of the risks identified by the team, a probability and impact factor will be assigned to each risk.

Some techniques will be used during the CICSS project risk management process including questionnaires, interviews, brainstorming, risk checklists and assumption analysis. Additionally, some tools will be used for the purposes of CICSS project risk management including RMP, risk log, risk likelihood and impact matrix.

Step 3: Risk Response Development

Risk response development will involve the selection of the best risk response strategy, and identification and planning of the actions to control risks. The selection of the risk response strategy for the CICSS project will be based on the results of the risk assessment (risk level), the type of risk, the effect of the risk(s) on overall project objectives (e.g., the effects on schedule and costs), and the cost of the strategy and its benefits (CBA).

The strategy (or strategies) selected for each risk will be documented in the CICSS risk log and the four (4) strategies that will be considered as potential risk responses are as follows:

- Risk avoidance which is when the team works, through the project or PMP, around those conditions or activities which introduce the risk;
- Risk mitigation or reduction which is when the team is proactive in the implementation of risk reduction activities;
- Risk acceptance which is when the impact or loss from the risk is just accepted if the risk occurs. When accepting risks, there are two (2) possible reactions:
    - The acceptance of the risk where no special action is required, except to continue monitoring the risk, i.e., passive acceptance; and
    - The acceptance of the risk and development of contingency plans in case the risk occurs, i.e., active acceptance; and
- Risk transference or sharing which is when a risk is transferred to or shared with other entities, e.g., through insurances, sub-contracting and partnering.

After the strategy for each risk has been selected, specific actions to implement the strategy will be defined, described, scheduled and assigned, while a risk owner assumes the responsibility for its implementation.

Actions will detail concrete activities, milestones and deliverables, and will be documented in the risk log. The CICSS project will clearly identify the target resolution date and will estimate the resources involved and their related dependencies. These actions

will be incorporated into the project work plan to create a consolidated view of all project related activities.

Chart 49: Risk Response Approach

(Source: https://www.pm2alliance.eu/publications)

Scenario	Risk Response Strategy
Very high impact and high or very high likelihood, or high or very high impact and very high likelihood	Avoid or implement an immediate reduction
Very high impact and very low likelihood	Transfer or Share
All other risk levels	Reduce
Low or very low likelihood and very low impact, or very low likelihood and low impact.	Accept and monitor and plan contingency, if deemed necessary

The project manager is responsible to decrease the probability and impact of threats and increase the probability and impact of opportunities. The Project manager must perform the following to ensure Project success. They include:

- Risk avoidance by changing or lowering requirements, while still meeting user needs.
- Risk control by taking active steps to minimize risks.
- Risk transference by reallocating design requirements to lower the risks.
- Risk monitoring by watching and periodically reevaluating the risk for changes to the assigned risk parameters.
- Risk acceptance by acknowledging the risk but not taking any action.

Step 4: Risk Control

Risk control will involve the monitoring and controlling of the implementation of the risk response activities while continuously monitoring the project environment for new risks or changes, e.g., the probability and/or impact in the risks already identified.

The project follow-up meetings will be used to revise the status of risks and related actions, and to identify new risks that can impact project milestones, deliverables or objectives. The review of the risk log will also appear in the agenda of the project review meetings. Risks will be revised at regular, predetermined intervals, but also after the occurrence of any event that might have a significant impact on the project environment and, thus, project risks. The updating of the risk log will include the adding new risks or actions, updating the status of response activities, changing risk levels based on mitigation actions and changing the assignment of actions.

The CICSS project risk owner will report periodically the status of the risk and any response activities to the PM. In turn, the PM will report to the Project Owner the status of the major risks and to other project stakeholders, as per the project's communications plan. If any of the identified risks occur, then the PM will ensure that the contingency plans are implemented, and related issues and updates are communicated to the project sponsor and management team.

The abovementioned activities are summarized in Figure 35 as performed by the PM throughout the project lifecycle in line with the Risk Management Plan.

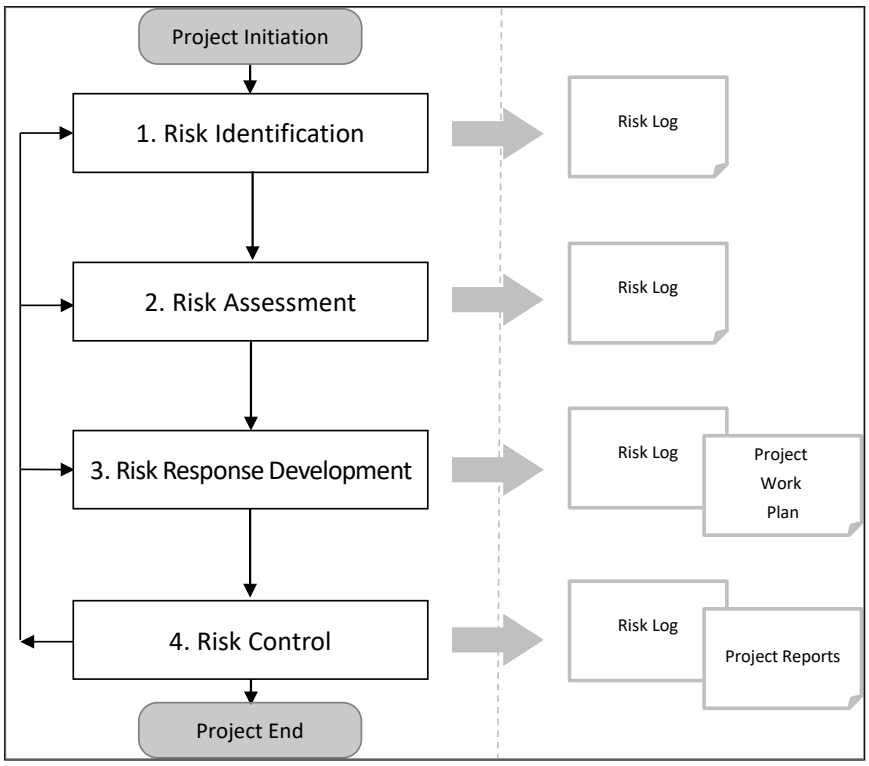


Figure 35: Risk Management Process Description

(Source: https://www.pm2alliance.eu/publications)

4.9.3 RISK MANAGEMENT ROLES AND RESPONSIBILITIES

The responsibility for managing risks would be the primarily responsibility of the CICSS project team and other key stakeholders. The PM will be responsible for the change control process, preparing the risk register, conducting regular risk identification and assessments activities, and reporting to the project sponsor on any risks that significantly impact on cost, schedule and quality of the project. Additionally, other members of the project team and other key stakeholders will have other related responsibilities to manage known and unknown project risks.

Chart 50: Roles and Responsibilities

(Source: https://www.tn.gov/content/dam/tn/finance/tbsm/TBSMRiskManagementPlan.docx)

Roles	Responsibilities
Consultants	• Assist in identifying and determining the context, consequence, impact, timing and priority of the risk
Project Manager	• Chair the risk assessment meetings • Coordinate with risk managers to determine if the risk is unique • Identify risk interdependencies across projects and verifies if risk is internal or external to project • Assign risk classification and tracking number • Continually monitor the projects for potential risks throughout the project lifecycle • Analyze any new risks that are identified and reflects those items in the risk register
Risk Manager	• Coordinate with a project team leader to identify the risks, the dependencies of the risk within the project, and the context and consequences of the risk • Determine the impact, timing and priority of the risk • Formulate the risk statements • Monitor and control risks that have been identified • Review and update the top ten (10) risk identified on the list

	• Escalate issues and problems to management
Risk Owners	• Determine which risks require mitigation and contingency plans • Generate the risk mitigation and contingency strategies and perform a cost benefit analysis of the proposed strategies • Monitor, controls and update the status of the risk throughout the project lifecycle • Aid in the development of the risk response and risk trigger • Carry out the execution of the risk response, if a risk event occurs • Participate in the review, re-evaluation and modification of the probability and impact for each risk item, on a weekly basis • Identify and participate in the analysis of any new risks that occur • Escalate issues or problems, to PM, which significantly impact the projects triple constraint or trigger another risk event to occur • Highlight risks that require action prior to the next weekly review • Identify and escalate risks where strategy is not effective or productive (causing the need to execute the contingency plan)

Other Key Stakeholders	• Assist in identifying and determining the context, consequence, impact, timing and priority of the risk

Chart 51: Risk RAM (RASCI)

(Source: https://www.pm2alliance.eu/publications)

RAM (RASCI)	**MOE**	**NTRC**	**PO**	**HOD**	**PTL**	**SP**	**PM**	**PT**
RMP	I	C	**A**	C	I	I	**R**	R
Manage Risks	I	C	**A**	**S**/C	**S**/C	I	**R**	R

The contact details of each of the above stakeholders are documented in the project stakeholder matrix.

The PM is responsible for identifying, assessing, managing and monitoring the risks of the project, consulting the project team and other key stakeholders, including NTRC, MOE and HOD when appropriate. The PM is also responsible for assigning resources to the risk management process, with the approval of the PO. The planning of risk management activities is performed by the PM and documented in the RMP.

New risks and related actions, as well as changes to identified risks and actions, are approved by the PO and reported to the Project Team Leader, according to the escalation procedure.

Risks and related actions will be escalated to other governance bodies, when appropriate. The PTL and the other governance bodies will validate the identified risks and actions, and plan other actions, if adequate.

4.9.4 RISK BREAKDOWN STRUCTURE

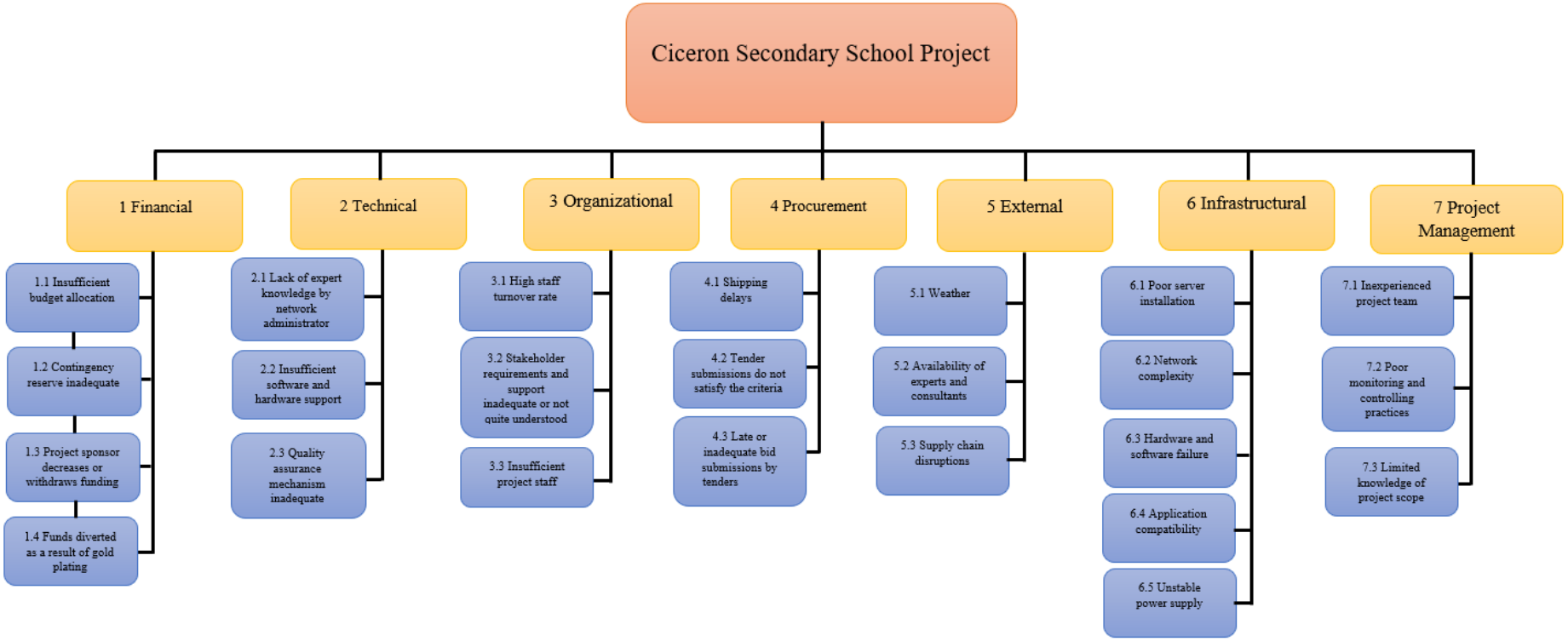


Figure 36: Risk Breakdown Structure

(Source: Author of study)

4.9.5 RISK PROBABILITY AND IMPACT MATRICES

In order to determine the severity of the risks identified by the team, a probability and impact factor will be assigned to each risk. The CICSS project will use the risk likelihood and or impact matrix and it represents the different combinations of likelihood and impact of project risks on a scale from 1 to 5. The matrix also defines risk levels which suggest risk response strategies. The use of this tool will allow the RO to prioritize risks based on their potential impact to the project. As risks are assigned a probability and impact, the PTL will move forward with risk mitigation or avoidance planning. The probability and impact of occurrence, for each identified risk, will be assessed by the RO, with input from the project team using the following approaches and tools.

Chart 52: Probability Scale Matrix

(Source: Author of study)

Rating	Description
1	**Very low**: between 1% to 10% change of occurrence
2	**Low**: between 11% to 30% chance of occurrence
3	**Medium**: between 31% to 50% chance of occurrence
4	**High**: between 51% to 70% chance of occurrence
5	**Very high**: more than (<) 70% chance of occurrence

Chart 53: Legend for Likelihood of Risks

(Source: Author of study)

Category	Qualitative Measures
Almost Certain	The event is expected to occur in most circumstances
Likely	The event will probably occur in most circumstances
Possible	The event might occur at some time
Unlikely	The event is not expected to occur in most circumstances
Rare	The event will only occur in exceptional circumstances

Chart 54: Likelihood of Risks

(Source: Author of study)

		Consequence				
		Insignificant	Minor	Moderate	Major	Severe
Likelihood	Almost Certain	Medium	High	High	Very High	Very High
	Likely	Medium	Medium	High	High	Very High
	Possible	Low	Medium	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	High
	Rare	Low	Low	Low	Medium	Medium

Chart 55: Risk Probability and Impact Matrix

(Source: Author of study)

Scale	Probability	+/- Impact on Project Objective		
		Schedule	Cost	Quality
5–Very High	> 70%	Delay in delivery Less than 6 months	$703,289.64	Very significant impact on project's cost, schedule and performance
4–High	51%-70%	Delay in delivery 8-10 weeks	$562,631.71	Significant impact on impact on project's cost, schedule and performance
3–Medium	31%-50%	Delay in delivery 6-8 weeks	$375.087.81	Some impact on project cost, schedule and performance
2–Low	11%-30%	Delay in delivery 2-4 weeks	$187,543.90	Minor impact on project cost, schedule and performance
1–Very Low	1%-10%	Delay in delivery 1 week	$46,885.98	Minor impact project cost, schedule and performance

Impact Key

- **Very low** impact occurs when 1% to 10% of project budget affected, or/and other project baselines are nearly not impacted, or/and few individuals affected (only internal to project team), or/and no reputational impact or/and easy and quick capacity to react and resolve the issue.
- **Low** impact occurs when 11% to 30% of project budget affected, or/and low impact in other project baselines, or/and only one milestone affected, or/and projects stakeholders may be affected, or/and reputational impact in the organisation or unit or/and sufficient project competencies to resolve the issue (if risk occurs).
- **Medium** impact occurs when 31% to 50% of project budget affected, or/and medium impact in other project baselines, or/and one or more milestones affected, or/and projects stakeholders will be to some extent affected, or/and project objectives may be affected, or/and reputational impact amongst technical staff in other organisations or units, or/and formal complaints, or/and limited project competencies to resolve the issue (if risk occurs).
- **High** impact occurs when 51% to 70% of project budget affected, or/and high impact in other project baselines, or/and several milestones affected, or/and projects stakeholders will be affected/concerned, or/and project objectives will be affected, or/and reputational impact in several organisations or units, or/and formal and legal complaints, or/and insufficient project internal competencies to resolve the issue (if risk occurs).
- **Very high** impact occurs when more than 70% of project budget affected, or/and very high impact in other project baselines, or/and several milestones affected, or/and projects stakeholders will be very affected/concerned, or/and the overall project will be

affected, or/and external reputational impact, or/and significant formal and legal complaints, or/and external competencies are needed to address the issue (if risk occurs).

Risk Score

The Probability and Impact Matrix is the matrix used to develop the risk score as outlined in Chart 55. The values range from one (1) (very low exposure) to twenty-five (25) (very high exposure). Risks with a value between one (1) and six (6) are considered low risks, risks between seven (7) and fourteen (14) are medium risks, and values between fifteen (15) and twenty-five (25) are considered very high risks.

The project team leaders and risk owner approved or stated that the project risk appetite is limited to risk level <=2, likelihood <10% and potential losses < XCD$.

Chart 56: Probability x Impact (PxI) Table

(Source: https://www.pm2alliance.eu/publications)

Score	Category	Action	Description
From 1-6	Green	Monitor	Minimum to action required to control risk
From 7-14	Yellow	Manage and monitor (mitigation action needed)	Management attention is required to control risk at an acceptable level
From 15-25	Red	Mitigate (escalate actions to control risk)	Specific immediate action required by the PSC and sponsor to control risk

Chart 57: Probability x Impact (PxI) Matrix

(Source: https://www.pm2alliance.eu/publications)

		Impact				
		1=Very low	2=Low	3=Medium	4=High	5=Very high
Likelihood	5=Very high	5	10	15	20	25
	4=High	4	8	12	16	20
	3=Medium	3	6	9	12	15
	2=Low	2	4	6	8	10
	1=Very low	1	2	3	4	5

Legend

Color Code	Description
	Risks can be accepted and contingency plans may be developed.
	Risks cannot be accepted and a risk response strategy should be developed to either avoid, reduce, transfer or share risks.
	Risk are unacceptable and an immediate risk reduction or avoidance response must be activated.
- - - -	Risk appetite

The risk appetite, in project management, is the level of uncertainty an organization or stakeholder is willing to take on in anticipation of reward at the end or to attain its objectives. CICSS is a non-profit educational institution and, as a result, the risk appetite is extremely low.

Impact Key

- High level risks have the potential to greatly impact project cost, project schedule or performance
- Medium level risks have the potential to slightly impact project cost, project schedule or performance
- Low level risks have relatively little impact on cost, schedule or performance

Risks that fall within the red and yellow zones will trigger a risk response plan which may include both a risk response strategy and contingency plan.

4.9.6 RISK REGISTER

The risk register for CICSS Project is a log of all identified risks, their probability and impact to the project, the category they belong to, mitigation strategy and when the risk is estimated to occur. This register will be created in the early planning phase of the project. Based on the identified risks and timeframes in the risk register, applicable risks will be added to the PMP. At the appropriate time in the plan, prior to when the risk is most likely to occur, the PM will assign a risk manager to ensure adherence to the agreed upon mitigation strategy.

Chart 58: Risk Register

(Source: Author of study)

RISK REGISTER								
RBS Code	**Risk**	**Consequence**	**Probability**	**Impact**	**PxI**	**Trigger**	**Owner**	**Strategy**
1.1	Insufficient budget allocation	Unable to achieve project deliverables	4	5	20	The baselines used to develop the budget were outdated.	PM Sponsor	Avoid–implement acceptable best practice procedures and techniques to develop the budgetary allocations for the project.
1.2	Contingency reserve inadequate	No budget for Unforeseen circumstances	4	5	20	The baselines used to develop the budget were	PM Project Owner	Avoid–implement acceptable best practice techniques to develop the

						outdated.		budget allocations for the project.
1.3	Project sponsor decreases or withdraws funding	Project not completely implemented	5	5	25	The sponsor is not satisfied with the project performance.	Sponsor MOE	Avoid–implement an appropriate mechanism to measure the project performance monthly, including the establishment of KPI.
1.4	Funds diverted as a result of gold plating	Specific project objectives not achieved	4	4	16	No allocation was made, by the beneficiary, to support implementatio	MOE	Avoid–ensure the approval and transfer of the counterpart resources to support the implementation

						n of the project.		of the project.
2.1	Lack of expert knowledge by network administrator	The trainer did not achieve the training requirements for the project	4	5	20	Trainees unable to attain certification.	PM	Avoid–include professional and experience requirements in the terms of reference for all project experts and consultants
2.2	Insufficient software and hardware support	The software and hardware that was procured is insufficient and does not lend	4	4	16	Programs cannot be implemented and completed successfully by	PM	Avoid–engage IT and curriculum Consultants as well as the HODs before the procurement

		adequate support to academic and vocational programmes.				students and teachers.		process can be undertaken.
2.3	Quality assurance mechanism inadequate	Equipment and other materials are not aligned to the specification standards set out by MOE and NTRC.	5	5	25	Inferior quality of the products and maintenance plan as a result of insufficient checks and balances laid out in the project.	Quality Assurance Officer PM	Avoid–reports and checklists are carefully scrutinized and measures put in place to avoid such occurrences.
3.1	High staff	Project	1	2	4	High level of	PM	Mitigate–mplement

	turnover rate	management process not efficiently managed due to staff turn-over rate.				mistakes		staff training and capacity building activities
3.2	Stakeholder requirements and support inadequate or not quite understood	Limited engagement with stakeholders	2	3	6	High level of conflicts between the PM and project team.	PM	Avoid–establish a structured mechanism to identify, and document stakeholder requirements.
3.3	Insufficient project staff	Project management	2	2	4	High level of mistakes	PM	Mitigate–mplement staff training and

		process not efficiently managed						capacity building activities
4.1	Shipping delays	Schedule delay	4	4	16	Schedule delay	PM Procurement project Expert	Escalate–seek an alternative supplier that can meet product specifications
4.2	Tender submissions do not satisfy the criteria	Schedule delay	4	4	16	High level of tender submission thrown out by Tender Evaluation Committee.	PM Procurement project Expert	Escalate–approval of project sponsor to change procurement approach

4.3	Late or inadequate submissions by tenders	Schedule delay	4	5	20	Late or no responses to tender advertisements	PM Procurement project Expert	Escalate–approval of project sponsor to change procurement approach
5.1	Weather	Schedule delay and possibility of project going over budget.	2	4	8	Force majeure as a result of weather delays or halts the project.	MOE NTRC PM	Mitigate–establish a contingency plan with the Project Owner, Sponsor and PM
5.2	Availability of experts and consultants	The most qualified consultants not selected for the project	2	5	10	Selected consultants are not the most qualified	PM Procurement Project Expert	Mitigate–establish strict recruitment and qualifications guidelines for consultants and the

								evaluation of scope proposals from consultants
5.3	Supply chain disruptions	Schedule delay	4	4	16	Equipment unavailable to complete the project	PM Procurement Project Expert	Escalate–seek an alternative supplier that can meet product specifications
6.1	Poor server installation	Malfunction in the brain of the network	4	5	20	Network system breakdown resulting in school system non functionality	PM IT Consultant MOE expert	Avoid–engage experts to formulate a checklist, specifications and testing protocol to avoid network failure

6.2	Network complexity	Intricate network system set up which presents a challenge for the consultants and experts	3	3	9	IT Technician has difficulty in updating and managing network resulting in delays	PM IT Consultant MOE expert	Avoid–engage consultants, experts and IT Technician to formulate a checklist and testing protocol to avoid network failure
6.3	Hardware and software failure	Hardware and software purchased malfunctions	4	5	20	Programs are halted because of the dependency on the hardware and software.	PM Consultants MOE	Avoid–engage consultants and technicians during the procurement and installation testing and installments
6.4	Application compatibility	Software applications are	3	3	9	Thin client machines are	PM	Avoid–engage consultants, experts

		incompatible with hardware and servers				not responding like the desktops because the applications are not designed to run on thin clients.	IT Consultant MOE expert	and technicians in researching application compatibility so that the correct adaptations, upgrades and installations can be purchased and performed.
6.5	Unstable power supply	Power fluctuations and surges causes damage to equipment and	5	5	25	Loss and damage to newly purchased equipment and	PM Consultant MOE	Avoid–ensure that each lab has its own uninterrupted power supply (UPS), line conditioners and or

		infrastructure.				infrastructure.		voltage regulators that would absorb surges and fluctuations in power
7.1	Inexperienced project team	Project management process not efficiently managed	1	3	3	High level of mistakes	PM	Mitigate–implement staff training and capacity building activities
7.2	Poor monitoring and controlling practices	Unable to track, report and manage the project's progress	2	5	10	Inaccurate forecasts, possibility of scope creep	PM	Avoid–engage project team in preparing checklists and protocols before signing off on various aspects of

								the project
7.3	Limited knowledge of project scope	Unable to manage project objectives, execution and achieve deliverables	2	5	10	High level of misconception the project scope.	Project Sponsor Project Beneficiary	Avoid–conduct knowledge building and awareness exercise about the project

4.9.7 CONTROL OR MONITOR RISKS

According to the PMI (2017), monitor risks is the process of monitoring the implementation of agreed-upon risk response plans; tracking identified risks; identifying and analyzing new risks; and evaluating risk process effectiveness throughout the project.

The level of risk in the CICSS project will be tracked, monitored, controlled and reported on throughout the project lifecycle. The most likely and greatest impact risks will be added to the project schedule to ensure that proper monitoring occurs during the time of risk exposure. As risks are added to the project schedule, a risk manager will be assigned. During the weekly project team meetings, the risk manager will discuss the status of their assigned risks.

Critical risks will also be assigned a risk owner(s) who will track, monitor and control their assigned risks. The risk owner will also provide a weekly status report to the PM and risk management team. This report will contain an assessment of the effectiveness of each risk response action.

As risk events occur, the list will be re-prioritized during weekly reviews and the RMP will reflect any and all changes to the risk lists including secondary and residual risks. The CICSS project will utilize some risk control measures including:

Risk reassessment

Risk reassessment involves identifying new risks and reassessing current ones. It is also involved in closing risks that are outdated and no longer threatening to the project.

Risk audits

A risk audit involves identifying and assessing all risks so that a plan can be put in place to deal with any occurrence of any undesirable event which causes harm to people or detriment to the organization.

Variance and trend analysis

It involves using performance information for comparing planned results to the actual results, in order to control and monitor risk events and to identify trends in the project's execution. Outcomes from this analysis may forecast potential deviation (at completion) from cost and schedule targets.

Reserve analysis

During the cost planning, the contingency and management reserves are added to the project Budget, as needed. As risks occur, the reserves may decrease. Depending on how your organization handles reserves and your RMP, PM may request more reserves, when inadequate.

Meetings

Project team members and stakeholders will be engaged in meetings to facilitate the risk management processes. The following meeting protocols will be adopted:

- Timely distribution of an agenda with a clearly stated meeting purpose;
- Timely distribution of invitations to the appropriate team members and stakeholders;
- Efficient use of appropriate tools and techniques; and
- Timely distribution of meeting minutes containing decisions, action items, issues and risks

Risk contingency planning

The CICSS project will include a contingency plan and its development will follow the procedure outlined below, to be able to allow for the efficient implementation of contingency risk strategies. These steps include:

- Identify and prioritize resources;
- Identify key risks and assign the risk to an owner;
- Draft a contingency plan:
    - Conduct a qualitative analysis to determine the likelihood and potential impact of the risk;
    - Determine the impact of the risk, as it relates to schedule, cost and quality;
    - Conduct a quantitative analysis to determine the severity level of the risks on project scope, cost and schedule; and
    - Determine risk response strategy;

- Share the plan;
- Review and update the risk registry; and
- Review and update the contingency plan.

Consideration will also be given to the contingency reserve.

4.10 PROCUREMENT PLAN

Procurement Management Plan for the upgrade of existing technological infrastructure, resources, and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia.

PREPARED BY: YASMIN TYSON

DOCUMENT VERSION

Chart 59: Document Control Information

(Source: https://www.pm2alliance.eu/publications)

Settings	Value
Document Title	Procurement Management Plan
Project Title	Project Management Plan for the upgrade of existing technological infrastructure, resources, and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia.
Document Author	Yasmin A. Tyson
Project Owner (PO)	Ciceron Secondary School
PM	Yasmin A. Tyson
Doc. Version	v1
Sensitivity	Public
Date	20/11/2022

Document Approver(s) and Reviewer(s):

Name	Role	Action	Date
		<Approve / Review>	

Abstract

This Procurement Management Plan sets the procurement framework for the CICSS project. It will serve as a guide for managing the procurement processes throughout the life of the project and will be updated as acquisition needs change. This plan identifies and defines the items to be procured, the types of contracts to be used in support of this project, the contract approval process and decision criteria. The importance of coordinating procurement activities, establishing firm contract deliverables and metrics in measuring procurement activities are also included in this plan. The plan was developed based on a templates retrieved from (n.d., Procurement Management Plan Template, Stakeholder Map https://www.stakeholdermap.com/project-templates/procurement-management-plan-template.html#),

(n.d., Procurement Management Plan Template, Project Practical https://www.projectpractical.com/procurement-management-plan-template-free-download/) and (2022, Procurement Management Plan Template, Tennessee State Government, https://www.tn.gov/content/dam/tn/finance/tbsm/TBSMProcurementManagementPlan.docx)

Table of Contents

4.10.0 INTRODUCTION

The PM or procurement officer from NTRC will provide an in-depth perspective and oversight, in collaboration with appropriate agency procurement and management staff, to all procurement activities under the CICSS project. The PM will work with the project team to identify all items to be procured for the successful completion of the project. The procurement officer and PM will then review the procurement list with the project management team for approval. The process involves determining whether to acquire outside support and, if so what to acquire, how to acquire it, how much is needed and when to acquire it.

4.10.1 PROCUREMENT MANAGEMENT APPROACH

The PM will provide oversight and management for all procurement activities under this project. The PM will work with the project team to identify all items to be procured for the successful completion of the project. The project owner and consultants will then review the procurement list prior to submitting it to the contracts and purchasing department of NTRC. The contracts and purchasing department will review the procurement items and begin the vendor selection, purchasing and contracting processes. The CICSS project procurement management plan will follow key activities during the procurement process and these steps are illustrated in Figure 37 below.

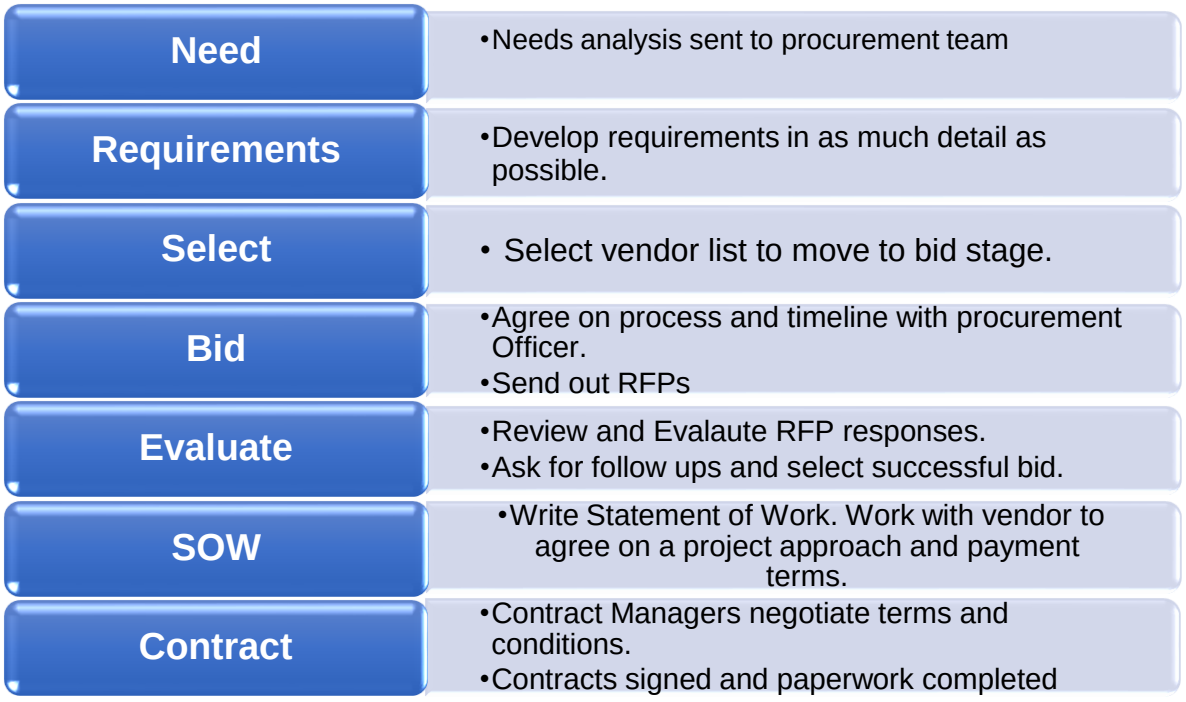


Figure 37: Procurement Process

(Source: https://www.stakeholdermap.com/project-templates/procurement-management-plan-template.html)

The procurement process for the CICSS Procurement Management Plan involves the following:

i. Initiating a request

ii. Develop requirements (technical, quality, timing and technology)

iii. Request approval

iv. Purchasing Authority

v. Conduct Bid/Proposal Review

vi. Contract Management responsibility

vii. Sellers Performance

viii. Contract Closure requirements

The components of the Procurement Management Plan which will be included in the CICSS project are explored further below.

i. Estimating

It is crucial to estimate the funds required for the project. In estimation, factors like net present value analysis, capital budgeting and CBA are compared and analyzed for future reference.

ii. Project scheduling

A project schedule clearly defines a task, start date, finish date and the project's budget. It is crucial to divide the work into different tasks for different roles, including external contractors, vendors and suppliers of service providers.

iii. Vendor control

Vendor control is an essential function in the process. It helps to ensure that the work of vendors are acceptable. Vendor control techniques should be a part of a plan that clearly defines the statement of results and references.

iv. Pre-qualified vendors

After setting up the vendor control techniques, it is vital to pre-qualify the vendors you want to work with. You can set your criteria for their qualification through past works, project team descriptions and or work methodology.

v. Roles and responsibilities

A procurement management plan defines the roles of the people involved in running the process smoothly. It clearly defines the role of project managers, technical managers, contract managers, operational managers and lawyers, and set their work boundaries.

vi. Risk management

A procurement management plan should have a risk profile for each project that involves risk level, risk tolerance, level of details, contracts, policies and reviews.

vii. Legal jurisdiction

A procurement management plan should always be addressed and equipped with legal jurisdictions. It helps bind the project and makes stakeholders aware of their work and act accordingly.

viii. Payments

A procurement management plan should always define project payment terms, modes and methods. This component is essential to avoid any potential conflicts and issues.

ix. Constraints and assumptions

A plan is constantly made in consideration of different constraints and assumptions that may occur in the future. It may include standard specifications, schedules, environment, geographical settings, ground conditions, quality or security.

4.10.2 PROCUREMENT DEFINITION

The following procurement items and/or services have been determined to be essential for successful completion of the CICSS project. The following list of items/services, justification and timelines are pending project team leader's review for onward submission to the NTRC.

Chart 60: Procurement Definition

(Source: https://www.projectmanagementdocs.com)

Product Goods & Services	**Cost**	**Owner**	**Responsibility**	**Procurement Method Selected**	**Selection Method**	**Evaluation Method**	**Contract Type**	**Procurement Period**
Network Consultant		Procurement expert, PM, NTRC and MOE	Preparing bid documents; Identifying Sellers; Selecting criteria; Approving purchases;	Request for Proposal	Quality based or technical proposal	Least Cost	Fixed Price Contract	8/07/22-5/12/22

			Identifying procurement risks and assignments; Awarding contracts; Prioritizing quality objectives; Monitoring performance					
ICT Expert		Procurement expert, PM, NTRC & MOE	Preparing bid documents; Identifying Sellers; Selecting criteria;	Request for Proposal	Quality based or technical proposal	Least Cost	Fixed Price Contract	8/07/22-5/12/22

			Approving purchases; Identifying procurement risks and assignments; Awarding contracts; Prioritizing quality objectives; Monitoring performance					
Training of IT Technician		Procurement expert, PM, NTRC and	Preparing bid documents; Identifying	Request for Proposal	Quality based or Technical	Least Cost	Fixed Price Contract	8/07/22-5/12/22

and HODs		MOE	Sellers; Selecting criteria; Approving purchases; Identifying procurement risks and assignments; Awarding contracts; Prioritizing quality objectives; monitoring performance		proposal			
Computer		Procurement	Preparing bid	Request for	Quality	Least Cost	Fixed	8/07/22-

and other ICTs Hardware and Software– infrastructural development		expert, PM, NTRC and MOE	documents; Identifying seller; Selecting criteria; Approving purchase; Identifying procurement risks and assignments; Awarding contracts; Monitoring performance	Quotation	based or technical proposal		Budget	5/12/22

4.10.3 CONTRACT TYPE

All items and services to be procured for CICSS project will be solicited under fixed price contracts. In this type of contract, the supplier agrees to perform the work for one (1) fixed price, regardless of the ultimate cost. The scope of work and duration of services required will be clearly defined and the price of the contract will not change unless the scope of work changes. The project team will work with the NTRC procurement staff to define the item types, quantities, services and required delivery dates. The Request for Proposal (RFP) Coordinator will then solicit bids from various vendors to procure the items within the required timeframe and at a reasonable cost under the fixed price contract once the vendor is selected.

4.10.4 STANDARD PROCUREMENT DOCUMENTATION

The procurement management process consists of many steps including the ongoing management of all procurement activities and contracts. In this dynamic and sensitive environment, our goal must be to simplify procurement management by all means necessary to facilitate successful completion of all contracts and the project. To aid in simplifying these tasks, we will use standard documentation for all steps of the procurement management process. These standard documents have been developed and revised over a period of many years to continually improve procurement efforts. They provide adequate levels of detail which allows for easier comparison of proposals, more accurate pricing, more detailed responses, and more effective management of contracts and vendors.

The procurement officer will follow the procurement guidelines and policies which are set out by the MOE and the NTRC Procurement Department. The procurement officer will also approve the final document and provide the NTRC, MOE and the PM with reports on the tender process including bid advertisement, bid opening and evaluations, contract awards and closure.

The standard documents for use during project procurement efforts will include:

1. Request for information (RFI) is used when more information, on the goods and services to be acquired, is needed from the sellers. RFI is used to seek information on various aspects from the prospective bidders. RFI is primarily used to filter out, from a huge list of bidders, and select a list of potential suppliers with whom finally an RFP or Request for Quotation (RFQ), with actual requirements, can be shared;
2. RFQ is commonly used when more information is needed on how vendors would satisfy the requirements and/or how much it will cost. RFP is a formal document that is used to clearly specify the requirements of certain purchases and request a price quotation;
3. RFP is used when there is a problem in the project and the solution is not easy to determine. RFP is a formal document that is used by the buyer to clearly specify their purchasing needs and the supporting requirements which will enable prospective sellers to understand the needs of the buyer;
4. Invitation for bid (IFB**)** is a formal document that is used for inviting potential bidders to participate in the bidding process;

5. Request for bid (RFB) is used to solicit financial bids for specified purchases from a selected pool of suppliers;
6. Purchase order (PO) can be raised favoring a supplier for regular purchases. PO is referred to as a unilateral contract that is raised by buyer which becomes binding to the seller once the seller accepts it;
7. A contract or agreement is a mutual agreement between the buyer and seller. A legal binding contract will have an offer, an acceptance and sufficient consideration for both the buyer and seller. The contract, once finalized, will include the detailed statement of work (SOW) and other terms and conditions;
8. Seller proposal is a detailed offer from the seller in response to the buyer's request for a proposal or buyer's request for a quotation; and
9. Terms of reference (TOR)/scope of work template where the TOR includes background, justification, objectives, the scope of works, deliverables, scope activities, duration reporting, qualifications, required resources, gender and social impact analysis;
10. Instruction to tenders;
11. Request for proposal template;
12. Request for quotation template;
13. Budget guidelines;
14. Bidding Documents including invitation to bid, instructions to bidders, the form of contract, conditions of contract, specifications, relevant technical data, duration, gender, social impact and appendices;
15. Method of evaluation and criteria;

16. Internal source selection evaluation forms;
17. Confidentially and transparency forms;
18. Non-disclosure agreements;
19. Letters of intent;
20. Contract templates;
21. Notification and award of contract; and
22. Procurement performance evaluation form.

4.10.5 PROCUREMENT APPROVAL PROCESS

The PM, along with the project team leaders, will meet with the NTRC Procurement Department to determine the type of procurement model that best meets the need of the project. If necessary, a RFI may be released as a first procurement step to gather information. Based on the vendor responses to the RFI, the PM and the NTRC Procurement Department will determine the procurement process that must be followed, such as non-competitive contract request, competitive negotiation, alternative procurement, RFP cost only or RFP.

The procurement documents must be submitted for NTRC Procurement Office's endorsement, the CICSS administrative team must approve training for HODs, and the NTRC Board must provide the final approval.

The criteria for the selection and award of procurement contracts under this project will be based on the following decision criteria:

- Comparison of outsourced cost versus in house sourcing;
- Mandatory requirements;
- Vendor financial documentation;
- General qualifications and experience (vendor and proposed staff);
- Past performance technical qualifications;
- Quality;
- Ability of the vendor to provide all items by the required delivery date;
- Software demonstration and/or oral presentation;
- System infrastructure impact; and
- Cost.

This criterion will be measured by the NTRC Procurement Department and the PM. The final decision will be made based on these criteria as well as available resources.

The NTRC Procurement Officer is ultimately responsible for managing vendors. To ensure the timely delivery and high quality of products from vendors, the NTRC Procurement Officer will meet weekly with purchasing and contracts department representatives, and respective vendors to discuss the progress of each procurement process. The purpose of these meetings is to review all documented specifications, for each product, and to review the quality test findings. This forum will provide an opportunity to review each item's development, or service provision to ensure that it complies with the requirements established in the project specifications. It also serves as an opportunity to ask questions or modify contracts or requirements, ahead of time, to prevent delays in delivery

and schedule. The NTRC Procurement Officer will be responsible for scheduling this weekly meeting until all items are delivered and are determined to be acceptable.

4.10.6 PROCUREMENT RISKS MANAGEMENT

While all risks will be managed in accordance with the project's RMP, which includes the RBS and risk register, specific reference to procurement risks must be considered including:

- Unrealistic schedule and cost expectations for vendors;
- Manufacturing capacity capabilities of vendors;
- Conflicts with current contracts and vendor relationships;
- Configuration management for upgrades and improvements of purchased technology;
- Potential delays in shipping and impacts on cost and schedule;
- Questionable past performance for vendors; and
- Potential that final product does not meet required specifications.

These risks are not all-inclusive and the standard risk management process of identifying, documenting, analyzing, mitigating and managing risks will be used. Project procurement efforts involve external organizations and potentially affect current and future business relationships, and internal supply chain and vendor management operations. Because of the sensitivity of these relationships and operations, the project team will include the project sponsor and a designated representative from the NTRC Procurement Office in all project meetings and status reviews.

Any decisions regarding procurement actions must be approved by the project sponsor. Any issues concerning procurement actions, or any newly identified risks will immediately be communicated to the NTRC Procurement Officer and the Project Sponsor.

4.10.7 PROCUREMENT CONSTRAINTS

There are several constraints that must be considered as part of the project's procurement management plan. These constraints will be included in the RFP and communicated to all vendors to determine their ability to operate within these constraints. These constraints apply to several areas which include schedule, cost, scope, resources and technology and shall be elaborated on below.

Firstly, the project schedule is not flexible and the procurement activities, contract administration and contract fulfillment must be completed within the established project schedule. Secondly and concerning project costs, the project budget has built-in contingency and management reserves, however, these reserves may not be applied to procurement activities. Reserves are only to be used in the event of an approved change in project scope or at management's discretion. Thirdly, all procurement activities and contract awards must support the approved project scope statement. Any procurement activities or contract awards which specify work which is not in direct support of the project's scope statement will be deemed out of scope and disapproved. Fourthly, all procurement activities must be performed and managed by the current personnel. No additional personnel will be hired or re-allocated to support the procurement activities on this project. Finally, concerning technology, parts specifications have already been

determined and will be included in the SOW as part of the RFP. While proposals may include suggested alternative material or manufacturing processes, parts specifications must be identical to the SOW.

4.10.8 CONTROL PROCUREMENTS

Control procurements is the process of managing procurement relationships monitoring contract performance and making changes and corrections, as appropriate; and closing out contracts (PMI, 2017). Control procurements includes application of the appropriate project management processes to the contractual relationship(s) and integration of the outputs from these processes into the overall management of the project. The PMI (2017), goes on to outline the control procurement activities which can be applied to this project and they are introduced below:

- Collection of data and management of project records including maintenance of detailed records of physical and financial performance, and establishment of measurable procurement performance indicators;
- Refinement of procurement plans and schedules;
- Setting up for gathering, analyzing and reporting procurement-related project data and preparing of periodic reports to the organization;
- Monitoring the procurement environment to facilitate implementation or appropriate adjustments; and
- Payment of invoices.

4.10.8.1 CONTRACT MANAGEMENT

Procurement contract management is the process of managing contracts related to procurement and purchases made as a part of legal documentation of forging work relationships with customers, vendors or even partners (Aavenir, 2022). The NTRC Procurement Department is responsible for the continuous monitoring of the contracts to ensure achievement of prescribed deliverables. This process also includes taking account of contract amendments and resolving disputes based on contract terms and conditions. Receiving, processing and reviewing payment requests is also a critical component of this process.

The official contract file should also contain the following:

1. A signed copy of the complete contract (award documents);
2. All signed amendments including rationale for the contract change and justification for the resulting cost/price or delivery date change;
3. All correspondence with the suppliers;
4. Invoices;
5. Proof of payment;
6. Approvals or disapprovals of contract deliveries;
7. Requests for waivers or deviations, and the associated responses;
8. Documentation regarding settlement of claims and disputes;
9. Documentation regarding stop work or suspension of work orders;
10. Contract closeout documentation; and

11. Written record of procurement history.

4.10.8.2 VENDOR PERFORMANCE MEASURE

The PM is ultimately responsible for managing vendors. To ensure the timely delivery and high quality of products from vendors, the PM or his/her official designee will meet weekly with the contract and purchasing departments, and each vendor to discuss the progress of each procurement process. The meetings can be in person or by teleconference.

The purpose of these meetings will be to review all documented specifications for each product and to review the quality test findings. This forum will provide an opportunity to review each item's development or the service provided to ensure that it complies with the requirements established in the project specifications. It also serves as an opportunity to ask questions or modify contracts or requirements ahead of time to prevent delays in delivery and schedule. The PM will be responsible for scheduling this weekly meeting until all items are delivered and are determined to be acceptable. Chart 61, which represents a procurement performance evaluation template, can be used to establish the performance criteria and matrix for vendor performance for this project. Thus, the following metrics are established for vendor performance for this project's procurement activities and each metric is rated on a 1-3 scale as reflected below

Chart 61: Procurement Performance Evaluation Template

(Source: https://gta.georgia.gov/document/publication/procurement-management-plan-template/download)

Vendor	Product/ Service Quality	Delivery Time	Transactional efficiency	Cost per Unit	Meet product specification/ qualifications	Compliance with negotiated terms
Vendor #1						
Vendor #2						

Key

1 for Unsatisfactory

2 for Acceptable

3 for Exceptional

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

4.10.8.3 CONTRACT CLOSURE

Contract closure refers to the process of completing all tasks and terms that are mentioned as deliverables and outstanding on the initial contract draft. In order for a contract to be ultimately and conclusively closed, the seller must have completed all components of his deliverables.

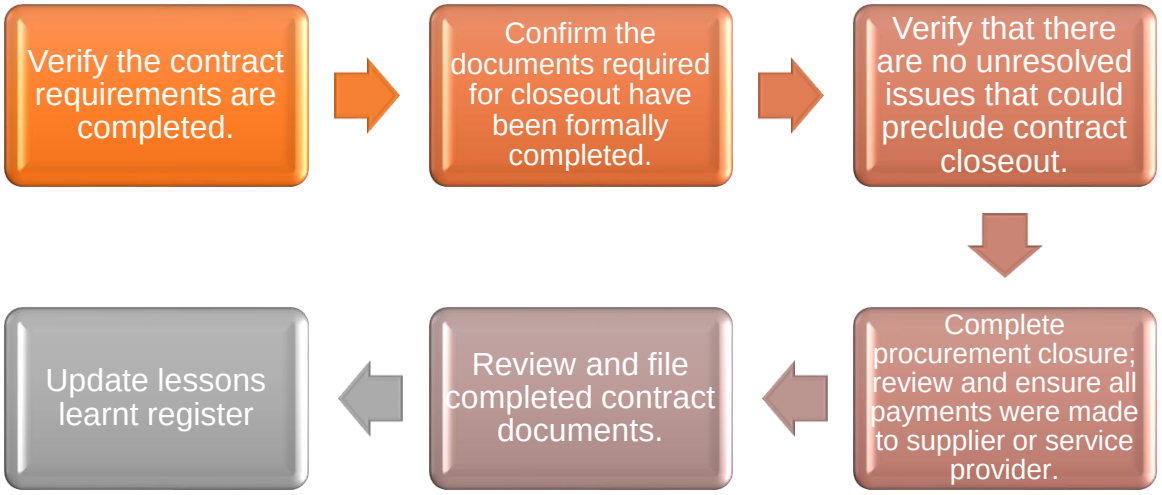


Figure 38: Process for the Closure of Contracts

(Source: Author of study)

4.11 STAKEHOLDER MANAGEMENT PLAN

Stakeholder Management Plan for the upgrade of existing technological infrastructure, resources, and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia.

PREPARED BY: YASMIN TYSON

DOCUMENT VERSION

Chart 62: Document Control Information

(Source: https://www.pm2alliance.eu/publications) www.ProjectManagementDocs.com)

Settings	Value
Document Title	Stakeholder Management Plan
Project Title	Project Management Plan for the upgrade of existing technological infrastructure, resources, and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia.
Document Author	Yasmin A. Tyson
Project Owner (PO)	Ciceron Secondary School
Project Manager (PM)	Yasmin A. Tyson
Doc. Version	v1
Sensitivity	Public
Date	20/11/2022

Document Approver(s) and Reviewer(s):

Name	Role	Action	Date
		<Approve / Review>	

Abstract

The stakeholder management plan is used for planning the engagement of stakeholders, developing strategies to reduce or eliminate resistance and creating strategies to increase support and buy-in. Because planning for stakeholder management generates activities, this plan becomes an input to other subsidiary plans. The plan was developed based on a templates retrieved from (n.d., Stakeholder Management Plan Template, Project Management Docs. https://www.projectmanagementdocs.com/template/project-initiation/stakeholder-management-strategy/),

Table of Contents

4.11.0 INTRODUCTION

Stakeholder management includes the processes required to identify the people, groups and organizations that could affect or be affected by the project, to analyze stakeholder expectations and their impact on the project, and to develop appropriate strategies and tactics for effective engagement of stakeholders in a manner appropriate to the stakeholders' interest and involvement in the project. The stakeholder management plan helps ensure that stakeholders are effectively involved in project decisions and execution throughout the lifecycle of the project, to gain support for the project and anticipate resistance, conflict or competing objectives among the project's stakeholders.

4.11.1 ROLES AND RESPONSIBILITIES

Chart 63 Stakeholder Roles and Responsibilities

(Source: Author of study)

Roles	Responsibilities
Project Sponsor	• Approve the stakeholder management plan • Collaborate on the development of the stakeholder engagement strategies • Participate in public engagements with stakeholders
Project Manager	• Identify stakeholders • Develop the stakeholder management plan • Conduct initial stakeholder analysis • Manage the stakeholder management plan
Project	• Collaborate in the preparation of the stakeholder engagement

Management Team	strategies • Participate in public engagements of stakeholders • Provide advice and reviews stakeholder management plan • Assist with the identification and classification of stakeholders • Supports the implementation of the stakeholder management plan
Project Team Member	• Undertakes the stakeholder analysis in consultation with the project manager and team • Drafts the stakeholder management plan • Provides advice and review the stakeholder management plan • Supports the identification and classification of stakeholders • Develops the stakeholder management strategies • Monitors the implementation of the stakeholder management plan • Provides progress reports to the project manager on the implementation of the stakeholder management plan
CICSS Administrative Team	• Assists with the development of the stakeholder's management plan • Assists with the development of stakeholder management strategies • Provides information to support the development and implementation of the stakeholder management plan • Makes recommendations to enhance the stakeholder management plan

Trainers	• Provide information to support the development and implementation of the stakeholder management plan • Make recommendations to enhance the stakeholder management plan • Assist with the identification and classification of stakeholders
Network Consultant	• Provides information to support the development and implementation of the stakeholder management plan • Makes recommendations to enhance the stakeholder management plan • Assists with the identification and classification of stakeholders
IT Consultant	• Provides information to support the development and implementation of the stakeholder management plan • Makes recommendations to enhance the stakeholder management plan • Assists with the identification and classification of stakeholders
MOE	• Provides information to support the development and implementation of the stakeholder management plan • Makes recommendations to enhance the stakeholder management plan • Assists with the identification and classification of stakeholders

4.11.2 STAKEHOLDER MANAGEMENT PROCESS

The PMI (2017), the stakeholder management processes as:

- Identify Stakeholders which is identifying project stakeholders regularly and analyzing and documenting relevant information regarding their interests, involvement, interdependencies, influence and potential impact on project success;
- Plan Stakeholder Engagement which is developing approaches to involve project stakeholders based on their needs, expectation, interests and potential impact on the project;
- Manage Stakeholder Engagement which is communicating and working with stakeholders to meet their needs and expectations, address issues and foster appropriate stakeholder engagement involvement; and
- Monitor Stakeholder Engagement which is monitoring project stakeholder relationships and tailoring strategies for engaging stakeholders through the modification of engagement strategies and plans.

The above mentioned are based on inputs from the approved business case, the Project charter and the scope management plan. Data will also be collected from interviews, stakeholder surveys, expert judgment and desk research which will form part of the inputs to the CICSS project stakeholder management processes.

4.11.3 IDENTIFY STAKEHOLDER AND ANALYSIS

Identify stakeholders is the process of identifying project stakeholders regularly and analyzing and documenting relevant information regarding their interests, involvement, interdependencies, influence and potential impact on project success (PMI, 2017).

Not all stakeholders will have the same influence or effect on a project nor will they be affected in the same manner. The CICSS project will be examining stakeholders, organizationally, geographically or by involvement in various project phases or outcomes, to identify those who are directly or indirectly impacted by the project.

Those who are directly affected by the CICSS project are the administration, staff and students of the CICSS. Stakeholders who are indirectly affected by the CICSS project are the parents, MOE and curriculum specialists.

To assist with stakeholder identification and analysis, a Stakeholder Analysis Register is being completed by the project team and will capture the names, contact information, titles, organizations and other pertinent information of all stakeholders. This is a critical tool during the stakeholder management process and will provide significant value for the project team to communicate with stakeholders in an organized and efficient manner. The stakeholder register (Chart 64) for the CICSS project is outlined below.

Chart 64: Stakeholder Register

(Source: Author of study)

CICSS Project Stakeholder Register							
Stakeholder Identification				**Stakeholder Analysis**			
No.	**Name**	**Role**	**Contact Information**	**Influence (H, M, L)**	**Impact (H, M, L)**	**Level of Engagement**	**Method of Communication**
1	NTRC	Project Sponsor	sjones@ectel.int	H	H	Supportive	Status reports, emails, face-to-face meetings, media presentations, online project meetings, focus group meetings
2	MOE	Policy and support, Consultant	CEO, PS	H	H	Supportive	Status reports, emails, face-to-face meetings, media presentations, online project meetings, focus group meetings
3	Yasmin	Project	ytyson@ciceron.edu.	H	H	Supportive	Status reports, emails, face-

CICSS Project Stakeholder Register							
Stakeholder Identification				**Stakeholder Analysis**			
	Tyson	Manager	lc				to-face meetings, media presentations, online project meetings, focus group meetings
4	HOD	Information dissemination	Provided through project contacts	M	L	Supportive	Status reports, emails, face-to-face meetings, media presentations, online project meetings, focus group meetings
5	Academic Liaison	Support, Information dissemination	spaul@ciceron.edu.lc	H	M	Supportive	Status reports, emails, face-to-face meetings, media presentations, online project meetings, focus group meetings

CICSS Project Stakeholder Register							
Stakeholder Identification				**Stakeholder Analysis**			
6	TVET Coordinator	Support, Information dissemination	ljoseph@ciceron.edu.lc	H	M	Supportive	Status reports, emails, face-to-face meetings, media presentations, online project meetings, focus groups meetings
7	Gilda Marcion	Education Quality Assurance Officer	gmarcion@ciceron.edu.lc	H	H	Supportive	Status reports, emails, face-to-ace meetings, media presentations, online project meetings, focus group meetings
8	CICSS Administration	Trainer, Administrative support	Provided through project contacts	H	H	Supportive	Status reports, emails, face-to-face meetings, media presentations, online project meetings, focus group

CICSS Project Stakeholder Register							
Stakeholder Identification				**Stakeholder Analysis**			
							meetings
9	CICSS Students	Trainees	Provided through project contacts	L	M	Supportive	Status reports, emails, face-to-face meetings, media presentations, online project meetings, focus group meetings
10	CICSS Staff	Educators	Provided through project contacts	L	M	Supportive	Status reports, emails, face-to-face meetings, media presentations, online project meetings, focus groups meetings
11	Network Consultancy Firm	Consultants and Trainers	Provided through project contacts	H	H	Supportive	Status reports, emails, face-to-face meetings, media presentations, online project

CICSS Project Stakeholder Register							
Stakeholder Identification				**Stakeholder Analysis**			
							meetings, focus group meetings
12	IT Manager	ICT Expert	jvernor@education.gov.lc	H	H	Supportive	Status reports, emails, face-to-face meetings, media presentations, online project meetings, focus group meetings

The engagement level of stakeholders, according to the PMI (2017), can be classified as follows:

- Unaware: When individuals are unaware of a project and its potential impacts;
- Resistant: When individuals are aware of the project and its potential impacts, but are resistant to any changes that may occur because of the work or outcomes of the project. These stakeholders are generally unsupportive of the work or outcomes of the project;
- Neutral: When individuals are aware of the project, but neither supportive nor unsupportive;
- Supportive: When individuals are aware of the project and its potential impacts, and supportive of the work and its outcomes; and
- Leading: When individuals are aware of the project and its potential impacts, and actively engaged in ensuring that the project is a success.

4.11.4 STAKEHOLDER POWER AND INTEREST GRID

Tarhanis (2021), provides a detailed explanation of the stakeholder power and interest grid. In this model, stakeholders can be grouped into four (4) categories as follows:

- Stakeholders with high power and high interest who should be managed closely. If they are positive and supportive, you can supply them with information and maintain their support. If they are negative, be careful during interaction and put effort into dealing with them. Some such stakeholders in the CICSS project are NTRC, MOE and PM;

- Stakeholders with high power and low interest who should be kept satisfied. If their interests change over time, they may have positive or negative effects on the project's goals;
- Stakeholders with low power and high interest who should be kept informed. If they are positive, use them to lobby other stakeholder groups and maintain their interests. If they are negative, do not spend too much time with them; and
- Stakeholders with low power and low interest should be monitored. If they are positive, provide them information because their position may change over time. If they are negative, do not spend too much time with them.

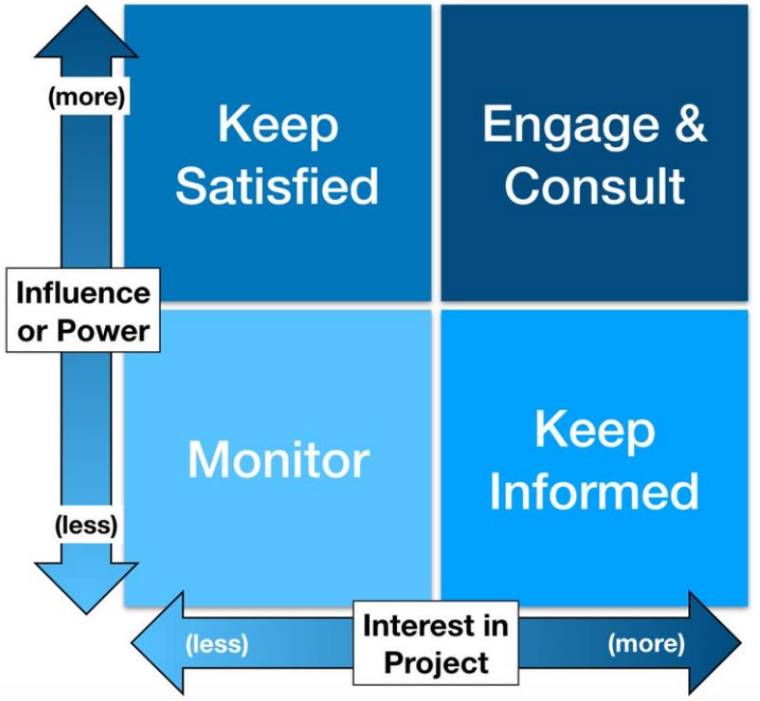


Figure 39: Power and Interest Grid

(Source: https://www.theprojectmanagementblueprint.com/blog/stakeholder-management/stakeholder-power-interest-grid)

The power/interest grid has an ‘x’ axis to represent interest and ‘y’ axis to represent power. The grid is split into four (4) quadrants, the bottom left quadrant comprises ‘monitor’, they are to be kept informed; the top left quadrant should comprise keep ‘satisfied’, they are actively consulted; top right quadrant should comprise the ‘engage and consult’, they are actively engaged, and the bottom right quadrant should comprise ‘keep informed’ these are persons whose interest that must be maintained.

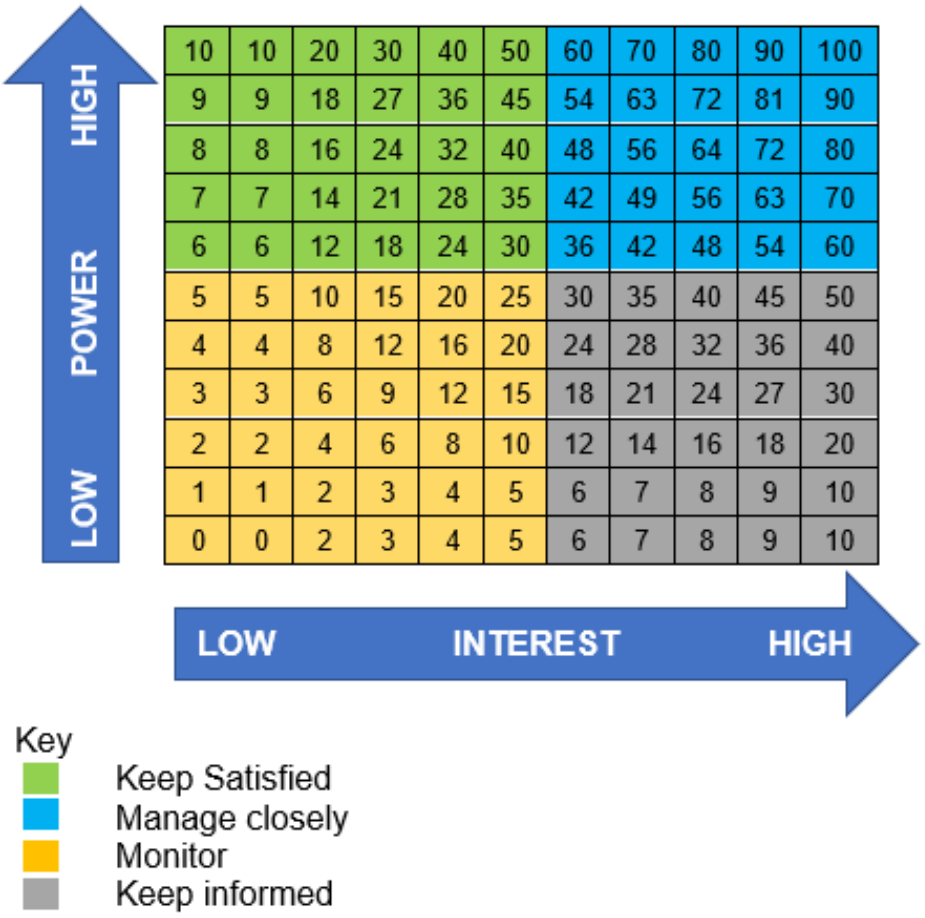


Figure 40: CICSS Power and Interest Grid

(Source: Author of study)

4.11.5 STAKEHOLDER ENGAGEMENT

PMI (2017) defines stakeholder engagement as “the process of communicating and working with stakeholders to meet their needs and expectations, address issues and foster appropriate stakeholder involvement” (p. 503). The CICSS project requires stakeholder engagement to be collaborative, inclusive and interactive. Stakeholder engagement is a sensitive and critical component of project buy in and success. The stakeholder register, stakeholder analysis and power interest grid will guide the process of formulating a comprehensive stakeholder engagement plan.

The stakeholder engagement process is a comprehensive, dynamic, ongoing cycle. Effective stakeholder engagement sets the standard for consistent, open and honest working relationships. Figure 42 illustrates a five-step process for maintaining and supporting effective stakeholder engagement through planning, preparation, action and evaluation of every engagement activity. The five-stage framework that will be adopted by the CICSS project will now be introduced:

1. Think strategically about the business issues that need to be addressed and the relevance of each stakeholder group, then create an initial stakeholder map for further analysis;
2. Analyze and plan using the stakeholder map prepared in stage 1, to identify the different stakeholder types, then consider the project objectives, stakeholder relevance and priority, existing relationships, available resources and organizational constraints;

3. Prepare and resource by considering stakeholders' competencies and capacity to engage and take necessary actions to address any barriers to effective engagement;
4. Design and engage stakeholders by considering different engagement approaches and outlining the most appropriate engagement techniques for each stakeholder type; and
5. Review and measure progress by evaluating and using input from stakeholders to achieve your project objectives, following up with stakeholders on the output of the engagement process, reviewing and refining the stakeholder engagement process and planning follow-up activities.

Figure 41: Stakeholder Engagement Framework

(Source: Adapted from https://sef.psc.nsw.gov.au/senior-executive-relationships/stakeholder-engagement)

4.11.6 MANAGE STAKEHOLDER ENGAGEMENT

According to PMI (2017), manage stakeholder rngagement is “the process of communicating and working with stakeholders to meet their needs and expectations, address issues and foster appropriate stakeholder involvement” (p. 503).

Manage Stakeholder Engagement involves activities, according to the PMI (2017), such as:

- Engaging stakeholders at appropriate project stages to obtain, confirm or maintain their continued commitment to the success of the project;
- Managing stakeholder expectations through negotiation and communication;
- Addressing any risks or potential concerns related to stakeholder management and anticipating future issues that may be raised by stakeholders; and
- Clarifying and resolving issues that have been identified.

Managing stakeholder engagement helps to ensure that stakeholders clearly understand the project goals, objectives, benefits and risks, and how their contribution will enhance project success (PMI, 2017).

Stakeholder influences are the highest at the start of the project and as the project progresses the influences continue to reduce. Stakeholder classification aims to group stakeholders according to their power, level of effect and influence on the project.

Stakeholders can be classified into one of four (4) groups as outlined below:

- The power and interest classification groups stakeholders according to their power and level of interest in the project's outcome. The power/interest grid can be used for this classification;
- The power and influence classification groups stakeholders according to their power and level of influence on the project's outcome. The power/influence grid can be used for this classification;

- The influence and impact classification groups

  stakeholders according to their influence and impact on the project's outcome. The influence/impact grid can be used for this classification; and
- The power, urgency and legitimacy classification groups

  stakeholders according to their power, urgency and legitimacy. The salience model can be used for this classification.

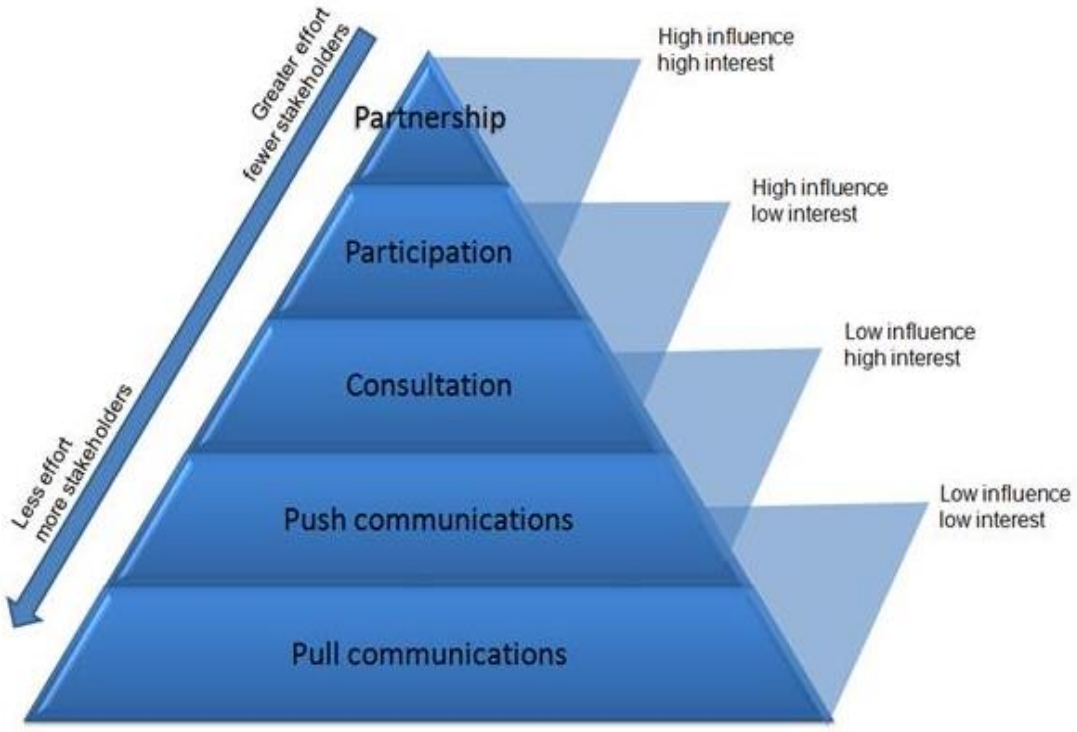


Figure 42: The relationship between stakeholder influence/power and stakeholder engagement approaches

(Source: https://www.stakeholdermap.com/stakeholder-engagement.html#ment)

Manage Stakeholder Engagement in the CICSS project will, therefore, be undertaken by gathering information, identifying stakeholder groups, and mapping and monitoring stakeholders. The following strategies will be employed in this process:

1. **Stakeholder mapping**

CICSS project stakeholders are identified early in the project and a thorough stakeholder analysis is conducted to identify stakeholders. Key factors such as proximity to your project, demographics, interest in the project, needs and concerns, expectations of the project and any previous public statements were taken into consideration in the compilation Charts 63 and 64. Internal stakeholder mapping will allow the PM to investigate the right match up with the resources and the effective functioning of the project team;

2. **Influence is key**

The levels of influence will allow the CICSS PM to predict how a particular stakeholder may interact directly with your project team or with others. The range of possible influence is broad, from positive sentiment and support through to activism and engagement of other community members against your project. To measure the possible influence of your stakeholders, identify their level on a scale ranging from high, medium to low. Warner (2020), details how stakeholder influence can be categorized below:

- **Low Power, Low Interest:** The Project Manager will not spend inordinate amounts of time communicating with them. Periodically monitoring them will be sufficient. That is, primarily to ensure that neither their power nor interest levels have materially changed.
- **Low Power, High Interest:** Because of their relatively low influence abilities, these stakeholders can do little harm to the project, but still are interested in the progress or ultimate result of the work the project team is performing. Keeping them informed and updated on the project is sufficient.

- **High Power, Low Interest**: It must be ensured their needs are fulfilled. They are not particularly interested in the outcome of your project one way or another, but still wield significant power over your ability to execute on time and budget.
- **High Power, High Interest**: The Project Manager must not only keep satisfied, but also actively engage with and consult. They can or will exert major influence over the project on a regular basis. This is evident in Figure 42 shown below.

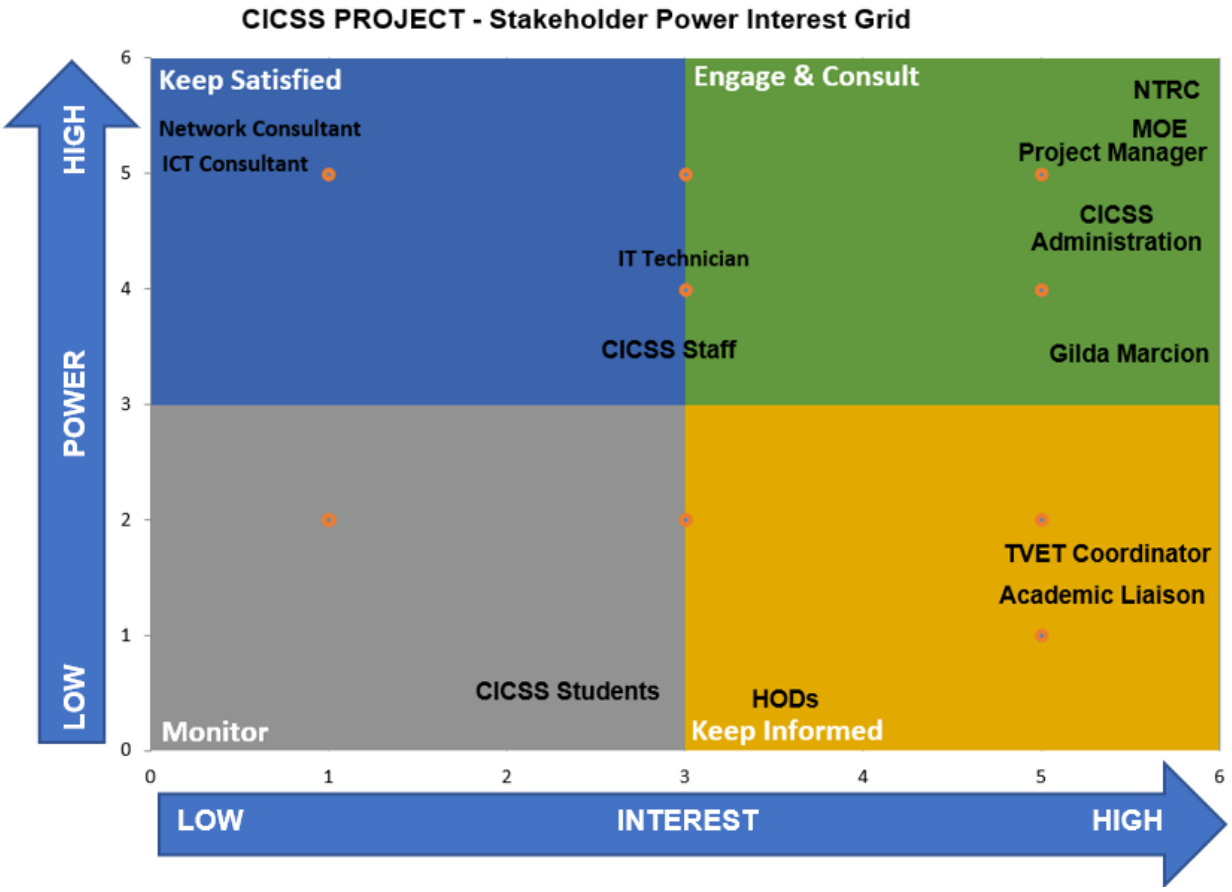


Figure 43: CICSS Project Stakeholder Power Interest Grid

(Source: Author of study)

3. **Identify the triggers**

Stakeholders will react in different ways to different project actions; however, the PM will identify triggers and relevant mitigation measures to avoid preventable complaints.

The stakeholder list will be correlated with potential known triggers and an estimate of the impact that these reactions may have to the project or strategies, and the PM will identify whether targeted communication, mitigation or an alternative solution is required;

4. **Look for opportunities**

Those stakeholders who view your project favorably or may benefit from it need to be identified and the PM will investigate opportunities to leverage their positive perception as project advocates; and

5. **Proactive mitigation**

Once the PM has understood the stakeholders, their influence and triggers, the next step is to develop a mitigation plan. This step details the risks the CICSS PM is prepared to accept, share or avoid, and outlines how the PM can reduce their impact. The PM and the project team need to identify early what are your negotiables and non-negotiables. Working with your stakeholders through this process will also improve project buy-in, project credibility and ownership of the mitigation measure.

4.11.7 MONITOR/CONTROL STAKEHOLDER ENGAGEMENT

PMI (2017), states that monitor stakeholder engagement is the "process of monitoring project stakeholder relationships and tailoring strategies for engaging stakeholders through modification of engagement strategies and plans" (p. 503). The key benefit of this process is that it maintains or increases the efficiency and effectiveness of stakeholder engagement activities as the project evolves and its environment changes.

Stakeholders are vital to the success of every project. Monitoring and controlling Stakeholder Engagement is more than just responding to concerns. The PM must be prepared to:

- anticipate engagement requirements;
- monitor stakeholder relationships;
- ensure that the engagement plan is followed; and
- adopt different strategies, when needed.

By Monitoring and Controlling Stakeholder Engagement, the CICSS PM will maintain and enhance the efficiency and effectiveness of stakeholder engagement activities.

Jersak (2022), describes fourteen (14) methods to effectively monitor stakeholder engagement. For this CICSS stakeholder management plan a selection of those methods will be implemented to ensure that stakeholders are monitored efficiently and effectively by the PM. A few of these methods are included, but are not limited to the following:

- Review items from the stakeholder engagement plan by including items on each status meeting agenda that are specific to the stakeholder(s) for discussion. Depending on the task or phase being executed at the time, different individual stakeholders may have responsibilities that need to be handled to maintain the project momentum;
- Check in with stakeholders regularly with certain questions in mind. Does the project team truly understand the stakeholders' needs? Are those needs being met? Are stakeholders' questions being addressed adequately? Do stakeholders feel supported? Do they feel they are supporting the project as expected? Do they have suggestions for ongoing activities?
- Ensure communication is happening, especially as several key stakeholders are typically not part of the day-to-day project execution. Often, they receive their information through status meetings, reports and project correspondence. The PM will ensure that the information stakeholders are receiving is sufficient–not too little, not overwhelming. As noted above, a scheduled check-in at each status meeting will help the PM understand if the key stakeholders are completely up to speed;
- Be aware of overwhelm and remember that stakeholders are human. Typically, these key stakeholders have significant organizational responsibilities, only one of which is the project;
- Monitor conflict at the stakeholder level means, more specifically, that the Project Manager must be politically aware. Stakeholders occasionally have conflict situations that may affect their project performance or involvement. The PM cannot

get involved in all situations but, must be aware of issues to maintain project cohesion and make good and relevant project decisions;

- Make stakeholders aware of potential risk events so that no one is blindsided. Stakeholders are often prominent within the organization and can engage in and support risk mitigation efforts if they are kept in the loop on key matters and issues; and
- Acknowledge stakeholder contributions. Stakeholders contribute to several projects overtime and help with risk events or project issues, and even offer suggestions. PM are typically good at rewarding their team members and need to extend their appreciation and accolades to the stakeholders as well.

5. CONCLUSIONS

The general objective of this project was to develop a PMP to upgrade existing technological infrastructure and technologies, improve student academic performance, student attendance and morale of the staff and students of the CICSS in Saint Lucia. This project allows the CICSS, especially its administration, teaching staff and students to fulfil their mandate of technology integration and infusion into its curriculum. It also allows the CICSS to develop sustainable key program, assessment and TVET expansion. This PMP was developed, to achieve the desired objectives, based on the principles and practices established in the PMI (2017). The project's results will revolutionize the technology impetus in various subject disciplines and boost teacher morale while improving the resource allocation at the school. Institutional strengthening and capacity building at the CICSS will be some of the spin offs achieved through this project. The support of the MOE is critical for project success and, notably, all activities will be supported through the NTRC's Universal Service Fund.

1. The project integration plan is the first of the deliverables during the development of the PMP. The project integration plan is a dynamic document and is therefore subject to regular changes which are all guided by the Change Management Process. The project charter will formerly introduce the project and is central to the project approval process. The project charter presents the business case and signals the 'go' or 'no go' components of the project. The project objectives are clearly delineated in the project charter along with the deliverables, milestones and scope statement. The Project Integration Plan sets the tone for the development of the PMP.

2. The scope management plan is developed during the planning phase of the project and stabilizes the project by establishing project structure and documenting the resources required to achieve the project objectives. The scope management plan is designed to ensure that the project is void of scope creep, gold plating and cost overruns; and it effectively serves as the project's operational framework throughout the project lifecycle. The comprehensive development of the scope management plan will provide guidance for all the development of all other project deliverables. It is a critical factor and forms the backbone of the PMP. Scope forms part of the triple constraints in project management and the scope management plan will assist in the prioritization of tasks to enable the planning and effective assignment of project resources.

3. The requirements management plan documents the various processes of documenting, analyzing, tracing, prioritizing and validating project requirements. These processes create consistency and transparency. The requirements management plan helps reduce costs, improve project quality, decrease the time it takes to complete the project, decrease risks and, as a result, allows the project team to develop a more effective and efficient scope management plan. The requirements process prioritization and the requirements traceability matrix are features of this plan, and all requirement descriptions are mapped to project objectives, deliverables, product development requirements, priority and verification. This reinforces the processes in the requirements management plan.

4. The schedule management plan keeps the project on track and is managed throughout the project's lifecycle. It outlines the start and end dates of tasks, and milestones that are vital for project completion. The schedule management plan is largely developed in the planning phase and ensures that the PM starts, monitors, controls and successfully completes the project. The CICSS project schedule is one hundred and one (101) days from July 18, 2022 to December 5, 2022. The project calendar reflects that there are twenty-one (21) average monthly workdays and seven (7) non-working days with a 40-hour work week. The CICSS schedule management plan will allow the PM to effectively monitor progress, identify issues and challenges from the onset, track communication to be able to keep everyone up to speed on project details. The project schedule management plan sets the pace of the project.

5. The cost management plan establishes the activities and criteria for planning, structuring and controlling project costs, such that, the cost baseline is established based on the WBS. Actual costs and cost variances are reported regularly to project sponsors, and the PM can estimate the project costs, allocate resources to the appropriate areas and control the overall spending. The CICSS cost management plan is operating on a budgetary allocation of XCD$1,285,719.52 with a 10% contingency of XCD$128,571.95, which is funded by the NTRC in the form of a grant. The NTRC will disburse and monitor project spending. Reporting guidelines and approval mechanisms will be established by the NTRC and the PM. The cost management plan creates a detailed outline of the project budget and allows the PM to fulfil project deliverables without cost overruns and project failure.

6. The quality management plan allows the PM to set standards and implement steps or phases to attain those standards that would inevitably result in project success. Quality assurance is an essential component of the quality management plan. It includes audits, testing and peer review. Project quality will be guided and monitored by the SLBS and the MOE rules and regulations, as well as by the relevant governmental and industry rules, regulations, and legislation. The CICSS quality management plan will ensure that there is strict and consistent adherence to measurable and verifiable standards to achieve uniformity of output that satisfies user requirements.

7. The resource management plan ensures requirements transparency to maximize Project profitability. It allows the PM to minimize idle time and the overutilization of resources. An effective resource management plan will allow for effective scheduling and management of resources thus aligning them to the project objectives and deliverables. This plan presents a more holistic picture of project progress as it feeds the procurement, schedule, quality and cost management plans. Resource Management includes planning, scheduling and allocating the resources to the right project at the right time and cost. The rationale behind the science of resource management is to minimize waste and ensure that high priority tasks have the resources they need at the right time.

8. The communication management plan ensures that the project stays on track, on time and on budget. An effective communication management plan also ensures that all

stakeholders are informed of the progress of the project to increase customer satisfaction. The communication management plan for the CICSS project outlines how to communicate most efficiently and effectively with the various stakeholders, and it defines and documents the communication items content, format, frequency, audience and the expected results. It explores the 5 Ws and 1 Hs of effective communication and presents the communication protocol, policies and procedure for the CICSS project.

9. The CICSS project risk management plan outlines the process involved in identifying, analyzing and mitigating risks that can affect the project and thus establishes a framework for the project. A PM cannot accurately analyze a project unless the risks associated are determined and effectively mitigated to ensure project risk. Project risk management enhances your revenue by saving your expenses, increases the sense of responsibility and accountability, and ensures the successful completion of project. The project uses a probability and impact matrix to assess the likelihood of occurrence for each risk identified by the PM. The Probability x Impact (PxI) Table shows that between scores 1-6 the risks need to be monitored, 7-14 the risks will be manage and monitor with some mitigation action and 15-25 the risk must be mitigated (escalate actions to control risk). The development of a risk management plan provides the PM with a systematic way to make proactive decisions to produce proper project deliverables.

10. The procurement management plan serves as a guide to manage procurement processes throughout the life of the project, and it will be updated as acquisition needs change. It

examines the external needs of the project relative to the standards set out in the quality management plan. The items to be procured all have set standards and specifications. The procurement management plan also works in tandem with the cost schedule and resource management plans to realize the project baseline. The plan examines the external needs of the project and, as such, project procurement policies, guidelines and regulations from the NTRC, MOE and SLBS will be adhered to by the CICSS project.

11. The stakeholder management plan presents the processes and approaches to facilitate the engagement of stakeholders, development of strategies to reduce or eliminate resistance, and creation of strategies to increase stakeholder support and buy-in throughout the project lifecycle. Key stakeholders, i.e., their level of power, impact and influence on the project; along with the advisable methods of communication were defined and documented with the relevant actions within the stakeholder management plan. The levels of engagement of both internal and external stakeholders were carefully examined for the most effective approaches in fulfilment of the project's objectives. This will increase support and minimize the negative impacts of stakeholders throughout the lifecycle of the project.

6. RECOMMENDATIONS

The general objective of this project was to develop a project management plan for the upgrading of existing technological infrastructure, technologies, improve student

academic performance, student attendance and the morale of the staff and students of the Ciceron Secondary School in Saint Lucia. The recommendations stated in this section will provide further insight and structure to the CICSS project and accelerate the execution process which is largely supported by the MOE and NTRC.

1. The integration management plan is the first such plan to be done for a project of this nature at the CICSS. As a result, all project entities should seize this opportunity to collaborate and present a systematic approach to execute this project. The NTRC, CICSS administrative team, PM and IT Manager should use the integration management plan to establish a positive environment which fosters institutional strengthening for CICSS.

2. Capacity building is a short fall of the CICSS and MOE as it relates to technology at CICSS. However, this project is one must be managed efficiently as persons cannot be overzealous and acquiesce to all wishes of stakeholders that are not in the scope management plan. The MOE and CICSS should adhere to guidelines of the scope management plan to avoid gold plating and scope creep which will improve the chances of the completion of a successful project.

3. Maintaining a project schedule can be a tedious process. The CICSS should take some ownership of the project via documentation of milestones achieved and actively keeping a daily countdown of the completion of various project activities. CICSS and NTRC can select persons to become project ‘watch dogs’ who can inform key team members

of when targets are approaching their due dates or falling behind schedule. This arrangement can serve as a precursor to formal reporting arrangements, so that measures can be implemented to redirect the project outcomes, when necessary.

4. Too often project activities are added, changed or eliminated without making the appropriate budgetary adjustments. This is typical when dealing with projects of this nature. NTRC and MOE need to implement, and closely monitor, a change control process to make necessary adjustments and keep the project within budget.

5. Quality is sometimes sacrificed for cost when dealing with MOE school projects. Quality assurance is a very critical component of project sustainability. NTRC and CICSS should undertake research to source equipment that is environmentally friendly and sustainable for this project without compromising the project objectives. Quality validation should be conducted at every stage of the project as poor-quality service and resources will have a significant impact on the project, and can cause frequent malfunctions, setbacks and retesting.

6. Efficient and effective use of resources are reliant of certain external factors and expertise. CICSS administration needs to ensure that its staff avail themselves to undertake the necessary training from the experts. Not all knowledge is available in training sessions but hands on experience is sometimes the best teacher. This will assist in troubleshooting practices as well as building professional capacity.

7. Communication is vital in this project as the major personnel in the project is external. CICSS should implement a communication framework which is aligned to the project. The management of the institution should enforce the guidelines in the communication management plan in its own administrative and operational practices to maintain efficiency, buy-in and inclusivity.

8. One (1) of the risks for the project beneficiary is damage due to power fluctuations and surges. The NTRC and MOE should collaborate with the Saint Lucia Electricity Services Limited (LUCELEC) to examine the possibility of solar power as an alternative energy source for the project. This will minimize the risk of damage to equipment and prolong the lifespan of the equipment. LUCELEC can simultaneously practice its corporate responsibility and gain some visibility from rendering project assistance.

9. Regenerative and sustainable development practices are currently trending globally because of climate change. NTRC and MOE should encourage their research and development departments to purchase from suppliers who utilize regenerative and sustainable development practices in the manufacturing and supplying of equipment and resources. A list of such suppliers should be kept for further use on related projects.

10. Stakeholders are key elements to all projects. In the CICSS project, the students are the main project beneficiary, so they should attend sensitization workshops to understand the value and necessity of the resources and services that are acquired, for their use,

through the project. Such efforts should foster buy-in, value and ownership among students and an opportunity to introduce sustainable education to the CICSS students.

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

This project is aligned to SDG number 4 according to (United Nations, 2022), which refers to Quality Education. This goal aims to “Ensure Inclusive And Equitable Quality Education And Promote Lifelong Learning Opportunities For All”. This PMP supplements the achievement of this objective by providing access, opportunity, quality and equity. So, the PMP supports successful project execution and satisfies SDG 4 requirements.

The ten (10) knowledge areas of project management are congruent with United Nation’s SDG, especially SDG 4 and It support the project management processes of initiation, planning, executing, closing, monitoring and controlling.

Key performance indicators such as accessibility, stakeholder engagement, funding, perceptions and performance can be utilized to determine the effectiveness of this PMP.

Regenerative development does not easily lend itself to this PMP as SDG 4, however, when developing the procurement management plan and procuring equipment some aspect of environmental regenerative development can be incorporated.

BIBLIOGRAPHY

Acquire Project Team - Project Management Knowledge. (n.d.). Project Management Knowledge. Retrieved October 27, 2022, from https://project-management-knowledge.com/definitions/a/acquire-project-team/

Ajuwon, G. (2018, April 10). *[PDF] Information Sources (Grace Ajuwon)-Free Download PDF*. Documen.site. https://documen.site/download/information-sources-grace-ajuwon_pdf

Allchin, C. (2021). *Communicating with Data*. "O'Reilly Media, Inc." (Original work published 2022)

American University School of Education. (2020, June 25). *How Important Is Technology in Education? Benefits, Challenges, and Impact on Students*. Soeonline.american.edu; American University School of Education. https://soeonline.american.edu/blog/technology-in-education

Asana. (2021, October 5). *Scope Management Plan: What Is It and How To Create One • Asana*. Asana. https://asana.com/resources/scope-management-plan

Averbuch, Z. (2021, June 23). *How—and why—to create a project management workflow*. Monday.com Blog. https://monday.com/blog/project-management/project-management-workflow/

Baena-Morales, S., Martinez-Roig, R., & Hernádez-Amorós, M. J. (2020). Sustainability and Educational Technology—A Description of the Teaching Self-Concept. *Sustainability*, *12*(24), 10309. https://doi.org/10.3390/su122410309

Barenscheer, T. (2022, March 4). *Requirements Management Planning: The Key to Project Success*. Official Teamly Blog - Official Teamly Blog - Your Project Management

Resource. https://www.teamly.com/blog/requirements-management-planning/

Bell, M. (2021, July 9). *A Three-Point Estimating Technique: PERT*. Project Management Academy Resources. https://projectmanagementacademy.net/resources/blog/a-three-point-estimating-technique-pert/

Bhandari, P. (2022, January 20). *An easy introduction to deductive reasoning*. Scribbr. https://www.scribbr.com/methodology/deductive-reasoning/

Bosevska, J., & Kriewaldt, J. (2019). Fostering a whole-school approach to sustainability: learning from one school's journey towards sustainable education. *International Research in Geographical and Environmental Education*, *29*(1), 55–73. https://doi.org/10.1080/10382046.2019.1661127

Brooks, C. (2020, October 19). *What is Statistical Analysis?* Www.businessnewsdaily.com. https://www.businessnewsdaily.com/6000-statistical-analysis.html

Brulotte, M. (2021, August 28). *What is RASCI/RACI*. Interfacing Technologies Corporation. https://www.interfacing.com/what-is-rasci-raci

Caniglia, E. (2018, May 14). *The Path to a Regenerative Future: The Importance of Local Networks and Bioregional Contexts*. Resilience. https://www.resilience.org/stories/2018-05-14/the-path-to-a-regenerative-future-the-importance-of-local-networks-and-bioregional-contexts/

Caribbean Examinations Council. (2022). *140020 - Ciceron Secondary School Grade Summary Centre Statistics report for June 2018-2022 administration*. Caribbean Examination Council Headquarters.

CDT - CA-PMF - Project Management Framework. (2019, June). Capmf.cdt.ca.gov. https://capmf.cdt.ca.gov/

Cemre Akkartal. (2019, December 17). *Plan Schedule Management Process: 9 Items to Include in the Plan*. Master of Project Academy Blog; blog.masterofproject.com. https://blog.masterofproject.com/plan-schedule-management-process/

CFI. (2022, February 17). *What is a Project Budget?-Example, Overview, and What to Include*. Corporate Finance Institute. https://corporatefinanceinstitute.com/resources/knowledge/finance/project-budget-overview/

Ciceron Secondary School (2017-2021). School Development Plan

Close Procurements | Project Management Professional (PMP). (n.d.). Www.greycampus.com. Retrieved November 20, 2022, from https://www.greycampus.com/opencampus/project-management-professional/close-procurements#:~:text=Procurements%20are%20closed%20when%20a

Communication methods in project management. (2021, March 30). AIPM; Australian Institute of Project Management. https://aipm.com.au/blog/3-communication-methods-in-project-management/

Communications management plan. (2022). Pic.gov. https://www.pic.gov/sites/default/files/HHS%20communications%20management%20template.doc

Communications-Monitor & Control. (n.d.). Projmgt. Retrieved November 1, 2022, from https://www.pmeducation.com/communications-monitor-and-control#:~:text=Monitor%20Communications%3A%20The%20process%20of

Connell, J. (Rucker). (n.d.). *LibGuides: First Year Seminar: Library Services & Resources Module: Module 2: Identifying Information Sources*. Libguides.wvutech.edu.

Retrieved August 17, 2022, from https://libguides.wvutech.edu/c.php?g=844889&p=6049871

Consultores, B. (2020, May 8). *Technology in the Teaching-Learning Environment*. Online Tesis. https://online-tesis.com/en/technology-in-the-teaching-learning-environment/

Contract Closure. (n.d.). Project Management Knowledge. Retrieved November 20, 2022, from https://project-management-knowledge.com/definitions/c/contract-closure/

Control Resources - Project Management Knowledge. (n.d.). Project-Management-Knowledge.com. Retrieved October 24, 2022, from https://project-management-knowledge.com/definitions/c/control-resources/

Control Schedule - Project Management Knowledge. (n.d.). Project Management Knowledge. Retrieved October 5, 2022, from https://project-management-knowledge.com/definitions/c/control-schedule/#:~:text=Control%20schedule%20is%20a%20process

Cost Management Plan. (2019, December 11). Project Management Docs. https://www.projectmanagementdocs.com/template/project-planning/cost-management-plan/#axzz7hKDHWL7B

Cruickshank, R. (n.d.). *Stakeholder Engagement-Monitor & Control*. Projmgt. Retrieved November 22, 2022, from https://www.pmeducation.com/stakeholder-engagement-monitor

Delve. (2022, February 11). *What is observational research?* Delve. https://delvetool.com/blog/observation#:~:text=Observational%20research%20is%20a%20research

Deskera Content Team. (2021, August 11). *How to Create a Procurement Management*

Plan in 7 Steps. Deskera Blog. https://www.deskera.com/blog/procurement-management-plan/#:~:text=A%20procurement%20management%20plan%20matters

Douglas, J. (2019). *Lack of access to technology in schools is holding pupils back | National Literacy Trust*. National Literacy Trust; National Literacy Trust. https://literacytrust.org.uk/news/lack-access-technology-schools-holding-pupils-back/

Dr.Jaganmohana Rao Gurugubelli. (2020, April 21). *Analytic & synthetic Method*. SlideShare. https://www.slideshare.net/JAGANMOHANARAO5/analytic-synthetic-method?from_action=save

Eby, K. (2019, January 16). *Demystifying the 5 Phases of Project Management*. Smartsheet. https://www.smartsheet.com/blog/demystifying-5-phases-project-management

Editorial Team, I. (2021, May 25). *What Is Project Cost Control? (With Tips and Process Steps)*. Indeed Career Guide. https://www.indeed.com/career-advice/career-development/project-cost-controls

Farag, A. (2021). 11.3. Contract Closing. *Ecampusontario.pressbooks.pub*, *11*(3). https://ecampusontario.pressbooks.pub/essentialsofprojectmanagement/chapter/11-3-contract-closing/#:~:text=Contract%20closure%20is%20concerned%20with

Gabel, M. (2016, January 25). *Regenerative Development: Going Beyond Sustainability– Kosmos Journal*. Kosmosjournal.org. https://www.kosmosjournal.org/article/regenerative-development-going-beyond-sustainability/

Ganimian, A. J., Vegas, E., & Hess, F. M. (2020, September 10). *Realizing the promise: How can education technology improve learning for all?* Brookings. https://www.brookings.edu/essay/realizing-the-promise-how-can-education-technology-improve-learning-for-all/

GATC. (2015). *Stakeholder Management Strategies*. Gtac.gov.za. https://www.gtac.gov.za/wp-content/uploads/2022/01/PLA10.Stakeholder-Management-Plan_Template_v5.0.doc

George, T. (2021, August 13). *An Introduction to Mixed Methods Research*. Scribbr. https://www.scribbr.com/methodology/mixed-methods-research/

Georgia Technology Authority. (2022). *Procurement management plan template*. Georgia.gov. https://gta.georgia.gov/document/publication/procurement-management-plan-template/download

Greycampus. (n.d.). Greycampus.com. Retrieved November 21, 2022, from https://www.greycampus.com/opencampus/project-management-professional/manage-stakeholder-engagement

Hall, H. (2019, March 7). *6 Tools and Techniques for Controlling Risks - Project Risk Coach*. Project Risk Coach. https://projectriskcoach.com/6-tools-and-techniques-for-controlling-risks/

Hamilton, K. (2022, January 10). *LibGuides Home: Primary, Secondary & Tertiary Sources: About*. Lacitycollege.libguides.com. https://lacitycollege.libguides.com/primarysecondary

Harrin, E. (2020, July 30). *How To Do Document Version Control (with example)*. RGPM. https://rebelsguidetopm.com/how-to-do-document-version-control

Hartney, J. (2019a, February 5). *The PMBOK Knowledge Areas*. Www.projectengineer.net. https://www.projectengineer.net/the-pmbok-knowledge-areas

Hartney, J. (2019b, April 18). *The Components of a Procurement Management Plan*. Www.projectengineer.net. https://www.projectengineer.net/the-components-of-a-procurement-management-plan

Harvard Catalyst. (2022). *Mixed Methods Research*. Catalyst.harvard.edu. https://catalyst.harvard.edu/community-engagement/mmr/

Hexagon. (2022, September 30). *Project cost management: Steps, basics, and benefits*. EcoSys. https://www.ecosys.net/knowledge/project-cost-management/

How to Document Project Requirements | Free Guide. (n.d.). Instagantt.com. Retrieved October 24, 2022, from https://instagantt.com/templates/documenting-project-requirements-template

How to Establish Quality Control Processes. (2017, August 23). Office in America. https://oia.officeinamerica.com/2017/08/establish-quality-control-processes

IZIEL. (n.d.). *QMS Documentation for Medical Devices | ISO 13485 Certification*. Iziel. Retrieved October 20, 2022, from https://iziel.com/quality-management-system

Janssen, L. (2022, March 18). *How COVID-19 exposed challenges for technology in education*. G-STIC. https://www.gstic.org/expert-story/how-covid-19-has-exposed-the-challenges-for-technology-in-education

Javed, A. (2021, June 23). *Methodological framework definition/structure/examples*. EngloPedia. https://englopedia.com/methodological-framework-definition

Jersak, M. (2022). *14 Methods to Effectively Monitor Stakeholder Engagement*. People First Project Management. https://peoplefirstprojectmanagement.com/14-methods-

to-effectively-monitor-stakeholder-engagement

Keup, M. (2020, February 24). *How to Make a Cost Management Plan*. ProjectManager.com. https://www.projectmanager.com/blog/cost-management-plan

Knowledge Hut. (2019, February 27). *Procurement Documents & Its Different Types | KnowledgeHut*. Www.knowledgehut.com. https://www.knowledgehut.com/tutorials/project-management/procurement-documents

Knowledge, G. (2022, October 1). *What Is Project Scope Management? An Overview*. Www.globalknowledge.com. https://www.globalknowledge.com/us-en/resources/resource-library/articles/project-scope-management/#gref

Labs, A. (2021, June 4). *Requirements Management Definition and Examples | Aha!* Www.aha.io. https://www.aha.io/roadmapping/guide/requirements-management

Landau, P. (2019, March 6). *10 Resource Allocation Tips for Managers*. ProjectManager.com. https://www.projectmanager.com/blog/resource-allocation

Lim, A. (2021, September 26). *Educational Technology: How Important Is It In Today's Education Industry?* ELearning Industry. https://elearningindustry.com/how-important-is-technology-in-todays-education-industry

LISBDNETWORK. (2018, October 16). *Sources of Information*. Library & Information Science Education Network. https://www.lisedunetwork.com/sources-of-information

Liu, C., Hwang, G.-J., Tu, Y., Yin, Y., & Wang, Y. (2021). Research advancement and foci of mobile technology-supported music education: a systematic review and social network analysis on 2008-2019 academic publications. *Interactive Learning*

Environments, 1–20. https://doi.org/10.1080/10494820.2021.1974890

Lucid Content Team. (2019, November 18). *Agile-Waterfall Hybrid: Is It Right for Your Team? | Lucidchart Blog*. Lucidchart.com. https://www.lucidchart.com/blog/is-agile-waterfall-hybrid-right-for-your-team

Manage stakeholder engagement. Project Management Professional (PMP). (n.d.). Greycampus.com. Retrieved November 22, 2022, from https://www.greycampus.com/opencampus/project-management-professional/manage-stakeholder-engagement

Mark H. Warner. (2019, April 26). *The project management blueprint*. The Project Management Blueprint. https://www.theprojectmanagementblueprint.com/blog/stakeholder-management/stakeholder-power-interest-grid

MATRIX, O. S. A. (2022, July 27). *What is a Medical Device Quality Management System (QMS)?* Oriel STAT a MATRIX Blog. https://www.orielstat.com/blog/medical-device-qms-overview/

Medak, K. (2022). *A project manager's guide to cost estimating and cost planning | The Frame Group*. Www.framegroup.com.au. https://www.framegroup.com.au/cost-estimating-and-planning

Miranda, D. (2022, March 25). *What Is A RACI Chart? How This Project Management Tool Can Boost Your Productivity*. Forbes Advisor. https://www.forbes.com/advisor/business/raci-chart

Monnappa, A. (2022, November 2). *Project Management: Interactive Vs. Push Vs. Pull Communication | Simplilearn*. Simplilearn.com.

https://www.simplilearn.com/interactive-vs-push-vs-pull-communication-in-project-management-article#:~:text=Push%20communication%20includes%20memos%2C%20letters

Mpiscopo. (2019, July 10). *What is a Stakeholder? How to Identify, Analyze and Manage Project Stakeholders.* Project Management Docs. https://www.projectmanagementdocs.com/blog/what-is-a-stakeholder-how-to-identify-analyze-and-manage-project-stakeholders

Müller, E. (n.d.). *Regenerative development, the way forward to saving our civilization*. Retrieved July 28, 2022, from http://www.ucipfg.com/REP/152/1523/00IUL/U2/01.pdf

Mypm. (2018). *ORGANIZATION'S NAME Schedule Management Plan Project Name: Project Number*. https://s7629.pcdn.co/wp-content/uploads/2015/02/Schedule-Management-Plan.pdf

Neelakantan, S. (2022, April 18). *How K–12 Schools Can Use Technology to Combat Absenteeism*. Technology Solutions That Drive Education. https://edtechmagazine.com/k12/article/2019/12/how-k-12-schools-can-use-technology-combat-absenteeism

Nicholas, J. (2021, August 25). *Introduction To Requirements Life Cycle Management | BusinessAnalystMentor.com*. Businessanalystmentor.com. https://businessanalystmentor.com/requirements-life-cycle-management/#:~:text=Requirements%20life%20cycle%20management%20is

NSW Public Service Commission. (2020, December 7). *Stakeholder engagement*. Senior Executive Fundamentals. https://sef.psc.nsw.gov.au/senior-executive-

relationships/stakeholder-engagement

Panchal, M. (2021, February 17). *The Benefits & Importance of Resource Management*. Quickscrum. https://guide.quickscrum.com/the-benefits-importance-of-resource-management

Paul, A. (2019). *CICSS Annual Report 2018-2019*. Adey Paul.

Paul, A. (2020a). *CICSS Annual Report 2019-2020*. Adey Paul.

Paul, A. (2020b). *CICSS Secondary Students Attendance Record 2019-2020*. Adey Paul.

Paul, A. (2020c). *CICSS Teachers Attendance Record 2019-2020*. Adey Paul.

Paul, A. (2021). *CICSS Annual Report 2020-2021*. Adey Paul.

Paul, A. (2022a). *CICSS Secondary Students Attendance Record 2021-November 2022*. Adey Paul.

Paul, A. (2022b). *CICSS Teachers Attendance Record 2021-November 2022*. Adey Paul.

Paul, S. (2022, October 25). *Five effective strategies to manage stakeholder engagement*. Phillips Group. https://www.phillipsgroup.com.au/insight/5-strategies-for-effective-stakeholder-management

PM^2 Alliance. (2021, October 4). *PM^2 Alliance Publications*. PM^2 Alliance. https://www.pm2alliance.eu/publications

Procurement Contract Management | Aavenir. (2022, August 1). Aavenir.com. https://aavenir.com/glossary/procurement-contract-management/#:~:text=Procurement%20contract%20management%20is%20the

Procurement Management Plan template | FREE Download. (n.d.). Stakeholdermap.com. https://www.stakeholdermap.com/project-templates/procurement-management-plan-template.html

Project Engineer. (n.d.). *Control Risks*. Www.projectengineer.net. Retrieved November 16, 2022, from https://www.projectengineer.net/knowledge-areas/project-risk/control-risks/

Project Management Free Templates by Project Management Docs. (n.d.). Project Management Docs. Retrieved October 12, 2022, from https://www.projectmanagementdocs.com

Project Management Institute. (2017). *A guide to the Project Management Body of Knowledge: (PMBOK® guide)* (6th ed.). Project Management Institute.

Project Management Institute. (2021). *Guide to the project management body of knowledge.* (7th ed.). Project Management Institute.

Project Team Developing. (2019). Mymanagementguide.com. https://mymanagementguide.com/guidelines/project-management/hr-management/project-team-developing/

Project-Management.com. (2021, May 4). *Requirement Traceability Matrix: RTM Overview 2022*. Project-Management.com. https://project-management.com/requirements-traceability-matrix-rtm

Quality Management Plan. (2019, December 11). Project Management Docs. https://www.projectmanagementdocs.com/template/project-planning/quality-management-plan/#axzz7i0Eg1atV

Quality management plan. (2022). Tn.gov. https://www.tn.gov/content/dam/tn/finance/tbsm/TBSMQualityManagementPlan.docx

QuestionPro. (2018, August 14). *Experimental Research- Definition, Types of Designs and*

Advantages | QuestionPro. QuestionPro. https://www.questionpro.com/blog/experimental-research/

Rachelson, D. (2021, April 26). *What is Sustainable Technology? | Rubicon*. Www.rubicon.com. https://www.rubicon.com/sustainability-hub/articles/what-is-sustainable-technology/

Requirements Documentation - Project Management Knowledge. (2022). Project-Management-Knowledge.com. https://project-management-knowledge.com/definitions/r/requirements-documentation/#:~:text=Requirements%20documentation%20in%20project%20management

Research Tools 1: Observation. (2019, December 22). New Directions in Business, Management, Finance and Economics. https://icndbm.cikd.ca/research-tools-1-observation

Resource management plan. (2020). Tn.gov. https://www.tn.gov

Resource Requirements Definition and Explanation - Project Management Definitions. (n.d.). Techleens.com. Retrieved October 24, 2022, from https://techleens.com/mba/project-management/what-is-resource-requirements.php

Roseke, B. (2019, May 10). *Guide to Earned Value Management*. ProjectEngineer. https://www.projectengineer.net/guide-to-earned-value-management/

Rosowsky, D. (2022, March 22). *The Role Of Research At Universities: Why It Matters*. Forbes. https://www.forbes.com/sites/davidrosowsky/2022/03/02/the-role-of-research-at-universities-why-it-matters/?sh=4ef3473e6bd5

Ruhercul. (2022, March 6). *Define resource requirements*. Learn.microsoft.com.

https://learn.microsoft.com/en-us/dynamics365/project-operations/resource-management/define-resource-requirements

Sadh, V. G. (2019). Green technology in education: Key to sustainable development. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3368186

Sagar, N. (2022, February 7). *How important is technology in education for student engagement?* Excellent Webworld. https://www.excellentwebworld.com/how-important-is-technology-in-education

Scavetta, A. (2019, December 31). *Requirements management: A quick guide*. ProjectManager.com. https://www.projectmanager.com/blog/requirements-management#:~:text=The%20benefits%20of%20managing%20your

Scoro. (2015, November 26). *16 essential project KPIs that benefit every team | Scoro*. Www.scoro.com. https://www.scoro.com/blog/16-essential-project-kpis/

Search | Primary Sources at Yale. (n.d.). Primarysources.yale.edu. Retrieved August 15, 2022, from https://primarysources.yale.edu/search/node/information%20sources

Sebastian. (2020, January 11). *Three-Point Estimating and PERT Distribution (Cost & Time Estimation)*. Project-Management.info. https://project-management.info/three-point-estimating-pert/

Shenoy, S. (2021a, April 3). *How To Control Your Project Schedule*. Www.pmexamsmartnotes.com. https://www.pmexamsmartnotes.com/control-schedule-process

Shenoy, S. (2021b, August 16). *Introduction to project management body of knowledge 6th version (PMBOK-6)*. Www.pmexamsmartnotes.com. https://www.pmexamsmartnotes.com/project-management-body-of-knowledge

Shoaib. (2019, July 10). *Acquire Resources Process*. PMC Lounge. https://www.pmclounge.com/acquire-resources-process/

Software, S. (2021, May 5). *The Complete Guide to Project Integration Management*. Resources Library. https://www.saviom.com/blog/complete-guide-project-integration-management

Sokolova, V. (2021, June 24). *Project Risk Management: Importance, Challenges, Recommendations*. EpicFlow. https://www.epicflow.com/blog/project-risk-management-importance-challenging-issues-recommendations

Srinivasan, B. (2018, March 4). *Based on PMBOK guide 6th edition*. Project Management & Leadership Champions. https://leadershipchamps.wordpress.com/project-management-mind-maps/based-on-pmbok-6th-edition

Tarhanis, W. (2018, March 23). *Stakeholder Analysis and Management Strategy*. Projectcubicle. https://www.projectcubicle.com/stakeholder-analysis-classification-management-strategy/#:~:text=Stakeholder%20classification%20aims%20to%20group

Team, E. (n.d.). *Procurement Management Plan Template [Free Download]*. ProjectPractical.com. https://www.projectpractical.com/procurement-management-plan-template-free-download/

Tiwari, S. (2022, January 20). *Interactive model of communication - definition and components - digiaide.com*. Digiaide. https://digiaide.com/interactive-model-of-communication

Twin, A. (2022). *Understanding key performance indicators (KPI)*. Investopedia. https://www.investopedia.com/terms/k/kpi.asp

UNDP. (2022). *Sustainable Development Goals | United Nations Development Programme*. Www.undp.org. https://www.undp.org/sustainable-development-goals#:~:text=The%20Sustainable%20Development%20Goals%20(SDGs)%2C%20also%20known%20as%20the

United Nations. (2022). *The 17 Sustainable Development Goals*. United Nations; United nations. https://sdgs.un.org/goals

Unwin, T. (2019). The future use of technology in education and learning in the commonwealth. *The Round Table*, *108*(4), 447–458. https://doi.org/10.1080/00358533.2019.1634891

Using Earned Value Management to Measure Project Performance. (2019, March). *Using Earned Value Management to Measure Project Performance*. ProjectManager.com. https://www.projectmanager.com/blog/using-earned-value-management-to-measure-project-performance

Usmani, F. (2022a, June 9). *9 essential contract documents in project management* |. PM Study Circle. https://pmstudycircle.com/contract-documents

Usmani, F. (2022b, July 17). *Using roles and responsibilities template in project management* |. PM Study Circle. https://pmstudycircle.com/roles-and-responsibilities-template

Usmani, F. (2022c, September 28). *Finish-to-Start relationship in project management* |. PM Study Circle. https://pmstudycircle.com/finish-to-start-relationship/#:~:text=According%20to%20the%20PMBOK%20Guide

Vasiliauskas, V. (2021, July 27). *Hybrid project management: What is it, methodology & software*. Teamhood. https://teamhood.com/project-management-resources/hybrid-

project-management

Viter, I. (2022a, January 27). *What is a resource breakdown structure? A quick guide*. PM Column. https://www.pmcolumn.com/resource-breakdown-structure-rbs

Viter, I. (2022b, May 2). *Understanding the Analogous Estimating Technique | Runn*. Www.runn.io. https://www.runn.io/blog/analogous-estimating

Walden University. (2019, February 5). *Top 5 benefits of technology in the classroom*. Waldenu.edu; Walden University. https://www.waldenu.edu/programs/education/resource/top-five-benefits-of-technology-in-the-classroom

What are the roles and responsibilities of key stakeholders? (2019, October 16). Information Technology at Sonoma State University. https://it.sonoma.edu/kb/pm/what-are-roles-and-responsibilities-key-stakeholders

What is project cost planning and control? | APM. (n.d.). Www.apm.org.uk. Retrieved October 11, 2022, from https://www.apm.org.uk/resources/what-is-project-management/what-is-project-cost-planning-and-control/#:~:text=Cost%20planning%20and%20control%20is

What is project management? (2017, April 11). Www.apm.org.uk. https://www.apm.org.uk/resources/what-is-project-management

Wilson, F. (2022, May 6). *Contingency planning in project management - what is it and why is it important? - nTask*. Www.ntaskmanager.com. https://www.ntaskmanager.com/blog/contingency-planning-in-project-management

Wootton, P. (2020, February 17). *Risk audit*. Https://Www.projectmanagement.com. https://www.projectmanagement.com/contentPages/wiki.cfm?ID=346698&thisPage

URL=/wikis/346698/Risk-audit#_=_

Yarbrough, Q. (2021a, May 18). *Project definition: The meaning of a project*. ProjectManager.com. https://www.projectmanager.com/blog/project-definition

Yarbrough, Q. (2021b, June 23). *Schedule performance index (SPI): An introduction - projectmanager*. ProjectManager.com. https://www.projectmanager.com/blog/schedule-performance-index-spi

Yee, L. (2022, February 11). *Definition: Cost Planning | projectfacts*. Www.projectfacts.com. https://www.projectfacts.com/glossary/cost-planning.html

Zongola, K. (n.d.). *LibGuides: Information Literacy Guide: Types of Information Sources*. Ufh.za.libguides.com. Retrieved August 17, 2022, from https://ufh.za.libguides.com/c.php?g=91523&p=590868

APPENDICES

APPENDIX 1: FGP CHARTER

1. Student name

YASMIN ARLET TYSON

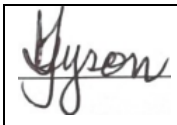
2. FGP name

Project Management Plan for the upgrade of existing technological infrastructure, technological resources and the provision of technological support training for the staff and students of the Ciceron Secondary School in Saint Lucia.

3. Application Area (Sector or activity)

Education and Technology

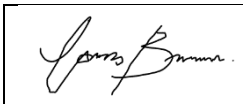
4. Student signature



5. Name of the Graduation Seminar facilitator

Professor Carlos Brenes Mena

6. Signature of the facilitator



7. Date of charter approval

July 30th, 2022

8. Project start and finish date

July 18, 2022	January 13, 2023

9. Research question

Would the project management plan for the upgrading of existing technological infrastructure, technologies and support training provide at least a 30% improvement in the quality of performance, the teaching learning environment, attendance and morale of the staff and students of the Ciceron Secondary School in Saint Lucia?

10. Research hypothesis

Is it possible that the project management plan for the upgrading of the existing technological infrastructure, technologies and support training of staff and students at the Ciceron Secondary School in Saint Lucia improve the performance, morale and attendance by at least 30%?

11. General objective

To develop a project management plan for the upgrading of existing technological infrastructure, technologies, improve student academic performance, student attendance and the morale of the staff and students of the Ciceron Secondary School in Saint Lucia.

12. Specific objectives

1. To develop a project charter and a project integration management plan to

identify and coordinate the processes and activities within the project lifecycle.

2. To create a sustainable scope management plan to establish the project deliverables and exclusions.
3. To prepare a schedule management plan to ensure completion of the project within a realistic and agreed timeframe.
4. To create a cost management plan to apply proper budget allocation and disbursement of funds throughout the project lifecycle.
5. To create a quality management plan to produce quality deliverables that meets the functional, educational and STEM specifications of a smart classrooms and laboratories.
6. To create a resource management plan to identify, acquire, and manage all resources needed for the completion of the project.
7. To develop a communication management plan for the effective communication of the project status to stakeholders and sponsor.
8. To develop a risk management plan to identify and evaluate project risks, and to develop risk response and mitigating measures.
9. To develop a procurement management plan to implement proper procurement procedures and processes.
10. To develop a stakeholder management plan to properly identify and manage stakeholder engagement.

13. FGP purpose or justification

The Ciceron Secondary School was once the beacon for technology integration education and technological resources in Saint Lucia. It boasted state of the art technology infrastructure, resources and the results both in academics and vocational subject areas. Over the years, through the neglect by administrators of Ministry of Education, Innovation, Gender Relations and Sustainable Development, the infrastructure, resources, student academic performance and teacher morale have all been hampered with the results to substantiate this claim. The school moved from a percentage pass rate of 85.77% in 2010 to 55.02% in 2022 at the CSEC level. This along with limited participation in national competitions and extra-curricular activities signaled the need for an urgent intervention.

The lack of technological resources and infrastructure has, in part, accounted for poor student academic performance, low student attendance, declining staff morale and a dormant school environment. This is evident in the stock piled non-functioning computers and other resources, limited WiFi and internet access in classrooms and laboratories. This makes the delivery, execution and completion of classes a challenge. With limited or no technological resources or infrastructure effective learning and participation cannot take place.

The CICSS student cohort ranges from low to middle income families and requesting students to get their own technological resources has proved difficult. Attempts to provide students with internet access in the classroom has proven futile as the signal does not get beyond the doorway due to poor the infrastructural layout. It is against this backdrop that the researcher believes that the Ciceron Secondary School is in need of technological resources and infrastructural upgrade to meet the demands of an ever-changing curriculum within the STEM framework.

14. Work Breakdown Structure

1 Final Graduation Seminar

1.1 Final Graduation Project Deliverables

1.1.1 Charter

1.1.2 Work Breakdown Structure

1.1.3 Chapter I Introduction

1.1.4 Chapter II: Theoretical Framework

1.1.5 Chapter III: Methodological Framework

1.1.6 Annexes

1.1.6.1 Bibliography

1.1.6.2 Schedule

1.2 Graduation Seminar Approval

2 Tutoring Process

2.1 Tutor

2.1.1 Tutor assignment

2.1.2 Communication

2.2 Adjustments of previous chapter (if needed)

2.3 Chapter IV Development (Results)

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 Chapter V: Conclusion

2.5 Chapter VI. Recommendations

3 Reading by Reviewers

3.1 Reviewers Assignment Request

3.1.1 Assignment of two Reviewers

3.1.2 Communication

3.1.3 Submission to Reviewers

3.2 Reviews work

3.2.1 Reviewer

3.2.1.1 FGP reading

3.2.1.2 Reader 1 report

3.2.2 Reviewer

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 the Board of Examiners

5.1 Final Review by Board

5.2 FGP Grade Report

FGP End

15. FGP budget

This budget is based on a three-month project duration, and both qualitative and quantitative data must be collected. All aspects of the project were taken into consideration.

Item #	Item	Quantity/Duration	Unit Cost USD	Total USD
1	Software licenses	3 months	$80.00	$240.00
2	Interviews	6 interviews	$25.00	$150.00
3	Printing and binding	3 months	$30.00	$90.00
4	Paper	3 months	$25.00	$75.00
5	Hiring of a Philologist	3 months	$20.00	$60.00
6	Meetings	3 months	$40.00	$120.00
7	Shipping Charges	3 months	$50.00	$150.00
Total				$785.00

16. FGP planning and development assumptions

1. The Ministry of Education, Innovation, Gender Relations and Sustainable Development will provide the necessary support for this project.
2. The National Telecommunications Regulatory Commission will provide full sponsorship for this project.
3. The estimated resources will be adequate to complete the project.
4. There will be a high level of stakeholder engagement to make the project a success
5. The project scope and requirements will have little to no changes.

17. FGP constraints

1. Time management is important as the project manager works fulltime and the period of July to December 2022 is usually a very intense working period for her.
2. There are some challenges with stakeholders understanding of project expectations, instructions and documentation based on perceived language barriers, unclear and seemingly contradictory guidance and material.
3. There may be an insufficient timeframe in which to complete the project.
4. There are possibilities of gold plating and scope creep as a result of requests by school administrators.

18. FGP development risks

- If there is another global outbreak of another virus, e.g., COVID-19, Monkey Pox, Foot and Mouth disease or Polio, the poor health of key stakeholders can prevent the project management plan from being completed on schedule.
- If there is a hurricane or any other severe weather outbreaks, it may significantly impact the project schedule and may delay the intended start and end dates.
- If there is poor participation by key stakeholders in data collection efforts then the information needed to make informed decisions will be inaccurate and significantly hamper the project.
- If there is ineffective and untimely communication between stakeholders, there may be increased instances of project delays, misunderstandings and leading to loss of data or misinformation and eventual project disruption.

19. FGP main milestones

WBS No.	**Deliverable**	**Start Date**	**Estimated Finish Date**
1.1	Final Graduation Deliverables	Jul.18, 2022	Aug. 12, 2022

1.1.1	Charter	Jul. 18, 2022	Jul. 22, 2022
1.1.2	Work Breakdown Structure	Jul. 18, 2022	Jul. 22, 2022
1.1.3	Chapter I Introduction	Jul. 25, 2022	Jul. 29, 2022
1.1.4	Chapter II: Theoretical Framework	Aug, 1, 2022	Aug. 5, 2022
1.1.5	Chapter III: Methodological Framework	Aug. 8, 2022	Aug. 12, 2022
1.1.6	Annexes	Jul. 25, 2022	Aug. 12, 2022
1.2	Graduation Seminar Approval	Aug. 15, 2022	Aug. 19, 2022
2.1	Appointment of Tutor	Aug. 22, 2022	Aug. 24, 2022
2.2	Adjustments of previous chapter (if needed)	Aug. 25, 2022	Aug. 31, 2022
2.3	Chapter IV Development (Results)	Sep. 1, 2022	Nov. 4, 2022
2.3.1	Integration Management Plan	Sep. 1, 2022`	Sep. 7, 2022
2.3.2	Scope Management Plan	Sep. 8, 2022	Sep. 14, 2022
2.3.3	Schedule Management Plan	Sep. 15, 2022	Sep. 21, 2022
2.3.4	Cost Management Plan	Sep. 22, 2022	Sep. 28, 2022
2.3.5	Quality Management Plan	Sep. 29, 2022	Oct. 5, 2022
2.3.6	Resource Management Plan	Oct. 6, 2022	Oct. 12, 2022
2.3.7	Communications Management Plan	Oct. 13, 2022	Oct. 19, 2022
2.3.8	Risk Management Plan	Oct. 20, 2022	Oct. 26, 2022
2.3.9	Procurement Management Plan	Oct. 27, 2022	Nov. 2, 2022
2.3.10	Stakeholder Management Plan	Nov. 3, 2022	Nov. 9, 2022
2.4	Chapter V: Conclusion	Nov. 10, 2022	Nov. 17, 2022
2.5	Chapter VI. Recommendations	Nov. 18, 2022	Nov. 25, 2022
3.1	Reviewers Assignment Request	Nov. 21, 2022	Nov. 25, 2022
3.1.1	Assignment of two Reviewers	Nov. 21, 2022	Nov. 22, 2022
3.1.2	Communication	Nov. 23, 2022	Nov. 24, 2022
3.1.3	Submission to Reviewers	Nov. 25, 2022	Nov. 25, 2022
3.2	Reviews work	Nov. 28, 2022	Dec. 9, 2022
3.2.1	Reviewer	Nov. 28, 2022	Dec. 9, 2022

3.2.2	Reviewer	Nov. 28, 2022	Dec. 9, 2022
4.1	Report for reviewers	Dec. 12, 2022	Dec. 22, 2022
4.2	FGP update	Dec. 23, 2022	Dec. 23, 2022
4.3	Second review by reviewers	Dec. 26, 2022	Jan. 6, 2023
5.1	Final Review by Board	Jan. 9, 2023	Jan. 10, 2023
5.2	FGP Grade Report	Jan. 11, 2023	Jan. 13, 2023

20. Theroretical framework

20.1 Estate of the "matter"

The CICSS's curriculum was established in 2004 with technology integration and technology use as a fundamental part of its programmes. In 2013, these technological resources were upgraded and replaced by a project sponsor, NTRC. The NTRC project came to a close in 2017. Since then, no attempts have been made to restore, upgrade or replace malfunctioning or damaged resources and equipment that have reached end of life or end of service life. As a result, all technologically-driven programmes at the CICSS have come to a halt, are operating on a skeleton framework or are creating little to no impact on students and staff. This has resulted in poor student performance, low student attendance and low staff morale.

The CICSS has the capacity to house four hundred and five (405) students and a current staff complement of thirty-seven (37) persons. At its peak, the school boasted a CSEC examination percentage pass rate range of 75%-85.77% and a student attendance rate of well over 85%.

The researcher believes that with the provision of adequate resources and infrastructural upgrades, the CICSS can be given the opportunity to function at its optimum and ultimately

increase student performance and attendance, improve staff morale and stimulate an environmentally-rich educational climate.

20.2 Basic conceptual framework

Project Management plan
Project lifecycle
Project management processes
Project management knowledge areas

21. Methodological framework

Objectives	Name Of Deliverable	Information Sources	Research Method	Tools	Restrictions
To develop a project integration	Project integration management	**Primary:** Interview transcripts of	Qualitative interviews, Observations,	Expert judgment, questionnaire, observation,	Processes are unclear and not properly

management plan to identify and coordinate the processes and activities within the project life cycle.	plan to coordinate all the processes and activities.	HOD, survey (questionnaire), minutes of meetings with stakeholders. **Secondary:** Reports PMBOK Guide 2017 and 2021	focus group discussions	checklist, meetings	developed in the PMP.
To create a sustainable scope management plan to establish the project deliverables and exclusions.	Scope management plan to ensure all deliverable are kept under control.	**Primary:** Interview transcripts, survey (questionnaire), minutes of meetings with stakeholders, statistical data **Secondary:** Policy documents PMBOK Guide 2017 and 2021	Qualitative and quantitative data analysis, inductive and deductive statistical data analysis, observation	Expert judgement, meetings, interviews, data analysis, group decision-making techniques, decomposition, data gathering, brainstorming, focus groups	Frequent changes to project scope cause delays in the commencement of the project.
To prepare a schedule management plan to ensure completion of	Schedule management plan to track and keep project on agreed timelines.	**Primary:** Interview transcripts, minutes of meetings with	Analytical-synthetic, observation, structured interviews,	Expert judgment, management information system: Microsoft	Availability and access to financing impacts project timeframe.

the project within a realistic and agreed timeframe.		stakeholder's survey (questionnaire), minutes of meetings with stakeholders, Statistical data **Secondary:** PMBOK Guide 2017 and 2021	quantitative	Project, Gantt chart, survey	Project funding must be secured to start.
To create a cost management plan to apply proper budgetary allocations and disbursements of funds throughout the project life cycle.	Cost management plan to ensure the estimates are kept under control and within budget.	**Primary:** Survey (questionnaire), minutes of meetings with stakeholders, statistical data **Secondary:** PMBOK Guide 2017 and 2021	Quantitative, inductive and deductive reasoning, statistical report, analogous estimating	Expert judgment, alternative analysis, reserve analysis, cost of quality, analogous estimating, historical information review, earned value analysis, trend analysis	Change in prices along with supply chain issues for equipment and materials inflate the cost of project.
To create a quality management plan to produce quality deliverables that meets the	Quality management plan to keep within local, regional and global standards.	**Primary:** Interview transcripts, survey (questionnaire), minutes of meetings with	Qualitative and quantitative data analysis, analytical method	Expert judgment, cost of quality, questionnaires, performance reviews, audits, inspection, checklists	Quality standards are not met as a result of not being able to source the required quality resources for the

functional, educational and STEM specifications of a smart classrooms and laboratories.		stakeholders, statistical data, government documents **Secondary:** PMBOK Guide 2017 & 2021			deliverables.
To create a resource management plan to identify, acquire and manage all resources needed for the completion of the project.	Resource management plan to control and allocate the appropriate the physical and human resources of the project.	**Primary:** Interview transcripts, survey (questionnaire), minutes of meetings with stakeholders, Statistical data **Secondary:** PMBOK Guide 2017 and 2021	Qualitative and quantitative data analysis, analytical and synthetic methods, inductive and deductive reasoning, statistical reports	Expert judgment, responsibility assignment matrix, resource breakdown structure, alternative analysis, bottom-up estimating, analogous estimating, parametric analysis, data representation: hierarchical chart	Resources may not be available for the execution of the project.
To develop a communication management plan for the effective communication of the project	Communication management plan for effective and appropriate mediums and methods of communication	**Primary:** Interview transcripts, minutes of meetings survey (questionnaire), minutes of	Qualitative and quantitative data analysis	Expert judgment, communication requirements analysis, communication technology, checklists,	Deliverables and milestones are not effectively or efficiently communicated to stakeholders.

status to stakeholders and sponsor.	are used when addressing all stakeholders.	meetings with stakeholders, statistical data **Secondary:** PMBOK Guide 2017 and 2021		communication Models, communication methods, project reporting, meetings, stakeholder engagement matrix	
To develop a risk management plan to identify, and evaluate project risks, and to develop risk response and mitigating measures.	Risk management plan to develop appropriate responses to risks.	**Primary:** Interview transcripts, survey (questionnaire), minutes of meetings with stakeholders, statistical data **Secondary:** PMBOK Guide 2017 and 2021	Qualitative and quantitative data analysis, analytical and synthetic, inductive and deductive reasoning, statistical data analysis	Expert judgment, stakeholder analysis. Interviews, checklist, brainstorming, root cause analysis, SWOT analysis, document analysis, risk categorization, probability and impact matrix, risk probability and impact assessment, assessment of other risks, decision tree analysis,	High impact risks or a force majeure may cause critical delays in the project.

				influence diagrams, cost benefit analysis, alternative analysis, strategies for overall project risks, audits, performance analysis	
To develop a procurement management plan for the project to implement proper procurement procedures and processes.	Procurement management plan to encourage sustainable procurement practices	**Primary:** Survey (questionnaire), minutes of meetings, statistical data **Secondary:** PMBOK Guide 2017 and 2021	Quantitative, inductive and deductive reasoning, statistical report, analogous estimating	Expert judgment, market research, source selection analysis, proposal evaluation, advertising, performance reviews, earned value analysis, trend analysis	Supply chain issues and import tariffs cause delays in the availability of materials.
To develop a stakeholder management plan to properly identify and manage stakeholder engagement.	Stakeholder management plan to manage and collaborate with all stakeholders	**Primary:** Interview transcripts, minutes of meetings survey (questionnaire), meetings with stakeholders, statistical data	Qualitative and quantitative data analysis, statistical reports, observation, focus group discussions	Expert judgment, questionnaires, brainstorming, stakeholder analysis, stakeholder mapping, stakeholder engagement	Stakeholder requirements level of interest, influence, and power change during the project due to slow progress of work

		Secondary: PMBOK Guide 2017 and 2021		matrix, root cause analysis, benchmarking, stakeholder analysis, power and interest matrix, power and influence matrix	

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

This project is most aligned to SDG number 4 which refers to Quality Education. This goal aims to "Ensure Inclusive And Equitable Quality Education And Promote Lifelong Learning Opportunities For All". This PMP supplements the achievement of this objective by providing access, opportunity, quality and equity. So, the PMP supports successful project execution and satisfies SDG 4 requirements.

The ten (10) knowledge areas of project management are congruent with United Nation's SDG, especially SDG 4 and It support the project management processes of initiation, planning, executing, closing, monitoring and controlling.

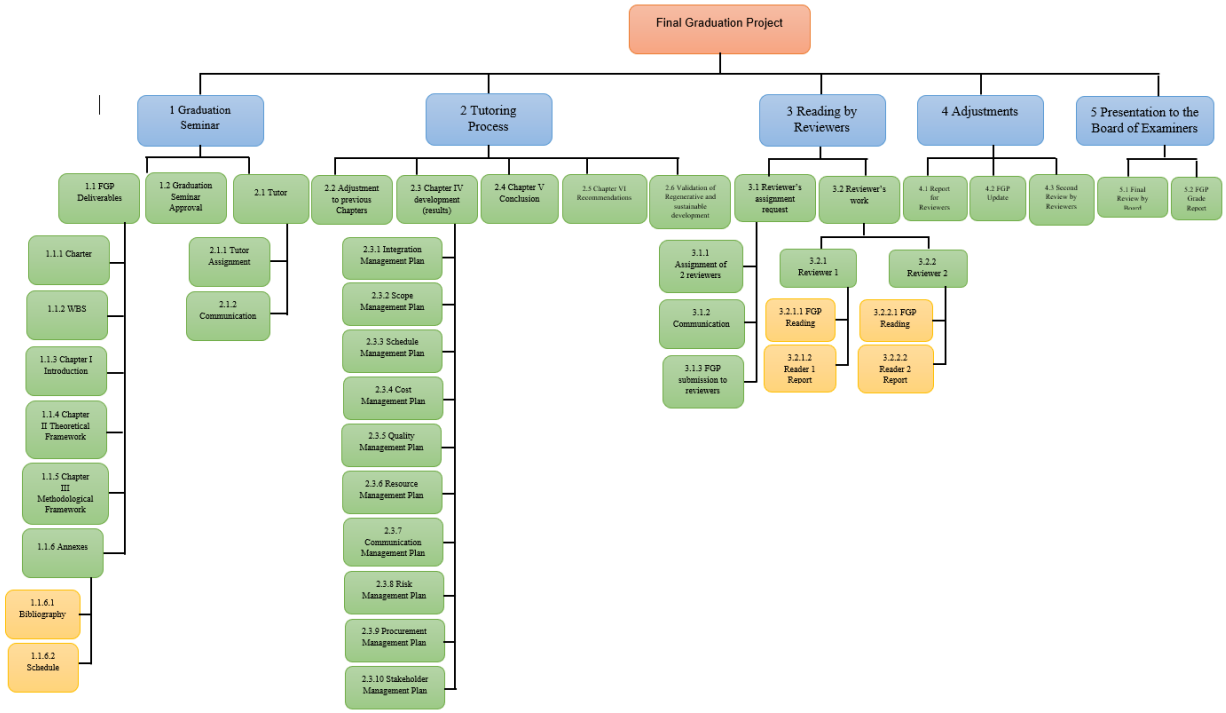
Key performance indicators such as accessibility, stakeholder engagement, funding, perceptions and performance can be utilized to determine the effectiveness of this PMP.

Regenerative development does not easily lend itself to this PMP as SDG 4, however, when developing the procurement management plan and procuring equipment some aspect of environmental regenerative development can be incorporated.

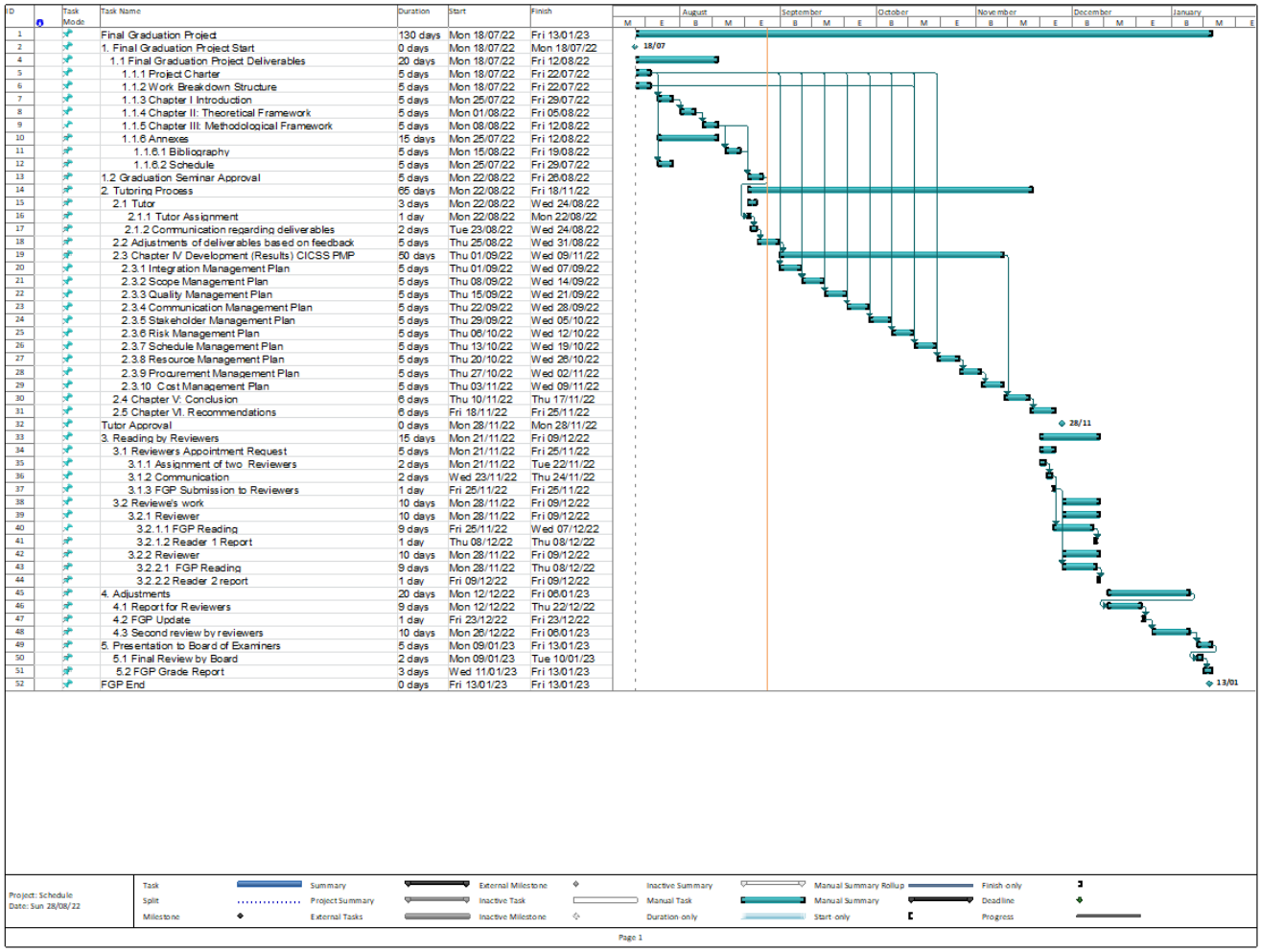
APPENDIX 2: FGP WBS

Final Graduation Project	
WBS No.	**Task**
1	Graduation Seminar
1.1	Final Graduation Deliverables
1.1.1	Charter
1.1.2	Work Breakdown Structure
1.1.3	Chapter I Introduction
1.1.4	Chapter II: Theoretical Framework
1.1.5	Chapter III: Methodological Framework
1.1.6	Annexes
1.1.6.1	Bibliography
1.1.6.2	Schedule
1.2	Graduation Seminar Approval
2	Tutoring process
2.1	Tutor
2.2	Adjustments of previous chapter (if needed)
2.3	Chapter IV Development (Results)
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	Chapter V: Conclusion
2.5	Chapter VI. Recommendations

3	Reading by Reviewers
3.1	Reviewers Assignment Request
3.1.1	Assignment of two Reviewers
3.1.2	Communication
3.1.3	Submission to Reviewers
3.2	Reviews work
3.2.1	Reviewer
3.2.1.1	FGP Reading
3.2.1.2	Reader 1 Report
3.2.2	Reviewer
3.2.2.1	FGP reading
3.2.2.2	Reader report 2
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


Final Graduation Project
1 Graduation Seminar
1.1 FGP Deliverables
1.1.1 Charter
1.1.2 WBS
1.1.3 Chapter I Introduction
1.1.4 Chapter II Theoretical Framework
1.1.5 Chapter III Methodological Framework
1.1.6 Annexes
1.1.6.1 Bibliography
1.1.6.2 Schedule
1.2 Graduation Seminar Approval
2.1 Tutor
2.1.1 Tutor Assignment
2.1.2 Communication
2 Tutoring Process
2.2 Adjustment to previous Chapters
2.3 Chapter IV development (results)
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 Communication Management Plan
2.3.8 Risk Management Plan
2.3.9 Procurement Management Plan
2.3.10 Stakeholder Management Plan
2.4 Chapter V Conclusion
2.5 Chapter VI Recommendations
2.6 Validation of Regenerative and sustainable development
3 Reading by Reviewers
3.1 Reviewer's assignment request
3.1.1 Assignment of 2 reviewers
3.1.2 Communication
3.1.3 FGP submission to reviewers
3.2 Reviewer's 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 the Board of Examiners
5.1 Final Review by Board
5.2 FGP Grade Report

APPENDIX 3: FGP SCHEDULE



ID	Task Mode	Task Name	Duration	Start	Finish
1		Final Graduation Project	130 days	Mon 18/07/22	Fri 13/01/23
2		1. Final Graduation Project Start	0 days	Mon 18/07/22	Mon 18/07/22
4		1.1 Final Graduation Project Deliverables	20 days	Mon 18/07/22	Fri 12/08/22
5		1.1.1 Project Charter	5 days	Mon 18/07/22	Fri 22/07/22
6		1.1.2 Work Breakdown Structure	5 days	Mon 18/07/22	Fri 22/07/22
7		1.1.3 Chapter I Introduction	5 days	Mon 25/07/22	Fri 29/07/22
8		1.1.4 Chapter II: Theoretical Framework	5 days	Mon 01/08/22	Fri 05/08/22
9		1.1.5 Chapter III: Methodological Framework	5 days	Mon 08/08/22	Fri 12/08/22
10		1.1.6 Annexes	15 days	Mon 25/07/22	Fri 12/08/22
11		1.1.6.1 Bibliography	5 days	Mon 15/08/22	Fri 19/08/22
12		1.1.6.2 Schedule	5 days	Mon 25/07/22	Fri 29/07/22
13		1.2 Graduation Seminar Approval	5 days	Mon 22/08/22	Fri 26/08/22
14		2. Tutoring Process	65 days	Mon 22/08/22	Fri 18/11/22
15		2.1 Tutor	3 days	Mon 22/08/22	Wed 24/08/22
16		2.1.1 Tutor Assignment	1 day	Mon 22/08/22	Mon 22/08/22
17		2.1.2 Communication regarding deliverables	2 days	Tue 23/08/22	Wed 24/08/22
18		2.2 Adjustments of deliverables based on feedback	5 days	Thu 25/08/22	Wed 31/08/22
19		2.3 Chapter IV Development (Results) CICSS PMP	50 days	Thu 01/09/22	Wed 09/11/22
20		2.3.1 Integration Management Plan	5 days	Thu 01/09/22	Wed 07/09/22
21		2.3.2 Scope Management Plan	5 days	Thu 08/09/22	Wed 14/09/22
22		2.3.3 Quality Management Plan	5 days	Thu 15/09/22	Wed 21/09/22
23		2.3.4 Communication Management Plan	5 days	Thu 22/09/22	Wed 28/09/22
24		2.3.5 Stakeholder Management Plan	5 days	Thu 29/09/22	Wed 05/10/22
25		2.3.6 Risk Management Plan	5 days	Thu 06/10/22	Wed 12/10/22
26		2.3.7 Schedule Management Plan	5 days	Thu 13/10/22	Wed 19/10/22
27		2.3.8 Resource Management Plan	5 days	Thu 20/10/22	Wed 26/10/22
28		2.3.9 Procurement Management Plan	5 days	Thu 27/10/22	Wed 02/11/22
29		2.3.10 Cost Management Plan	5 days	Thu 03/11/22	Wed 09/11/22
30		2.4 Chapter V: Conclusion	6 days	Thu 10/11/22	Thu 17/11/22
31		2.5 Chapter VI. Recommendations	6 days	Fri 18/11/22	Fri 25/11/22
32		Tutor Approval	0 days	Mon 28/11/22	Mon 28/11/22
33		3. Reading by Reviewers	15 days	Mon 21/11/22	Fri 09/12/22
34		3.1 Reviewers Appointment Request	5 days	Mon 21/11/22	Fri 25/11/22
35		3.1.1 Assignment of two Reviewers	2 days	Mon 21/11/22	Tue 22/11/22
36		3.1.2 Communication	2 days	Wed 23/11/22	Thu 24/11/22
37		3.1.3 FGP Submission to Reviewers	1 day	Fri 25/11/22	Fri 25/11/22
38		3.2 Reviewe's work	10 days	Mon 28/11/22	Fri 09/12/22
39		3.2.1 Reviewer	10 days	Mon 28/11/22	Fri 09/12/22
40		3.2.1.1 FGP Reading	9 days	Fri 25/11/22	Wed 07/12/22
41		3.2.1.2 Reader 1 Report	1 day	Thu 08/12/22	Thu 08/12/22
42		3.2.2 Reviewer	10 days	Mon 28/11/22	Fri 09/12/22
43		3.2.2.1 FGP Reading	9 days	Mon 28/11/22	Thu 08/12/22
44		3.2.2.2 Reader 2 report	1 day	Fri 09/12/22	Fri 09/12/22
45		4. Adjustments	20 days	Mon 12/12/22	Fri 06/01/23
46		4.1 Report for Reviewers	9 days	Mon 12/12/22	Thu 22/12/22
47		4.2 FGP Update	1 day	Fri 23/12/22	Fri 23/12/22
48		4.3 Second review by reviewers	10 days	Mon 26/12/22	Fri 06/01/23
49		5. Presentation to Board of Examiners	5 days	Mon 09/01/23	Fri 13/01/23
50		5.1 Final Review by Board	2 days	Mon 09/01/23	Tue 10/01/23
51		5.2 FGP Grade Report	3 days	Wed 11/01/23	Fri 13/01/23
52		FGP End	0 days	Fri 13/01/23	Fri 13/01/23

APPENDIX 4: PRELIMINARY BIBLIOGRAPHICAL RESEARCH

Ajuwon, G. (2018, April 10). *[PDF] Information Sources (Grace Ajuwon)-Free Download PDF*. Documen.site. https://documen.site/download/information-sources-grace-ajuwon_pdf

Allchin, C. (2021). *Communicating with Data* (1st ed.). "O'Reilly Media, Inc."

American University School of Education. (2020, June 25). *How Important Is Technology in Education? Benefits, Challenges, and Impact on Students*. Soeonline.american.edu; American University School of Education. https://soeonline.american.edu/blog/technology-in-education

APM. (2019). *What Is Project management?* Apm.org.uk. https://www.apm.org.uk/resources/what-is-project-management/

Baena-Morales, S., Martinez-Roig, R., & Hernádez-Amorós, M. J. (2020). Sustainability and Educational Technology—A Description of the Teaching Self-Concept. *Sustainability*, *12*(24), 10309. https://doi.org/10.3390/su122410309

Bhandari, P. (2022, January 20). *An easy introduction to deductive reasoning*. Scribbr. https://www.scribbr.com/methodology/deductive-reasoning/

Bosevska, J., & Kriewaldt, J. (2019). Fostering a whole-school approach to sustainability: learning from one school's journey towards sustainable education. *International Research in Geographical and Environmental Education*, *29*(1), 55–73. https://doi.org/10.1080/10382046.2019.1661127

Brooks, C. (2020, October 19). *What is Statistical Analysis?* Www.businessnewsdaily.com. https://www.businessnewsdaily.com/6000-statistical-analysis.html

Caniglia, E. (2018, May 14). *The Path to a Regenerative Future: The Importance of Local*

Networks and Bioregional Contexts. Resilience. https://www.resilience.org/stories/2018-05-14/the-path-to-a-regenerative-future-the-importance-of-local-networks-and-bioregional-contexts/

Ciceron Secondary School (2017-2021). School Development Plan

Connell, J. (Rucker). (2022, July 7). *LibGuides: First Year Seminar: Library Services & Resources Module: Module 2: Identifying Information Sources*. Libguides.wvutech.edu. https://libguides.wvutech.edu/c.php?g=844889&p=6049871

Consultores, B. (2020, May 8). *Technology in the Teaching-Learning Environment*. Online Tesis. https://online-tesis.com/en/technology-in-the-teaching-learning-environment/

Delve. (2022). *What is observational research?* Delve. https://delvetool.com/blog/observation#:~:text=Observational%20research%20is%20a%20research

Douglas, J. (2019, April 24). *Lack of access to technology in schools is holding pupils back | National Literacy Trust*. National Literacy Trust; National Literacy Trust. https://literacytrust.org.uk/news/lack-access-technology-schools-holding-pupils-back/

Eby, K. (2019, January 16). *Demystifying the 5 Phases of Project Management*. Smartsheet. https://www.smartsheet.com/blog/demystifying-5-phases-project-management

Ganimian, A. J., Vegas, E., & Hess, F. M. (2020, September 10). *Realizing the promise: How can education technology improve learning for all?* Brookings. https://www.brookings.edu/essay/realizing-the-promise-how-can-education-technology-improve-learning-for-all/

Gurugubelli J. R. Dr. (2020, April 21). *Analytic & Synthetic Method*. Share andDiscover Knowledge on SlideShare. https://www.slideshare.net/JAGANMOHANARAO5/analytic-synthetic-method?from_action=save

Hamilton, K. (2022, January 10). *LibGuides Home: Primary, Secondary & Tertiary Sources: About*. Lacitycollege.libguides.com. https://lacitycollege.libguides.com/primarysecondary

Hartney, J. (2016, February 5). *StackPath*. Projectengineer.net. https://www.projectengineer.net/the-pmbok-knowledge-areas/

Research Tools 1: Observation. (2019, December 22). New Directions in Business, Management, Finance and Economics. https://icndbm.cikd.ca/research-tools-1-observation/

What is Information Sources | IGI Global. (n.d.). Www.igi-Global.com. Retrieved August 15, 2022, from https://www.igi-global.com/dictionary/information-sources/14512

Janssen, L. (2022). *How COVID-19 exposed challenges for technology in education*. G-STIC. https://www.gstic.org/expert-story/how-covid-19-has-exposed-the-challenges-for-technology-in-education/

Javed, A. (2021, June 23). *Methodological framework definition/structure/examples*. EngloPedia. https://englopedia.com/methodological-framework-definition/

Kam Cheong Li, Yuen, E., & Tak, B. (2020). *Innovating Education in Technology-Supported Environments* (1st ed.). Springer.

Lim, A. (2021, September 26). *Educational Technology: How Important Is It In Today's Education Industry?* ELearning Industry. https://elearningindustry.com/how-

important-is-technology-in-todays-education-industry

LISBDNETWORK. (2018, October 16). *Sources of Information*. Library & Information Science Network. https://www.lisedunetwork.com/sources-of-information/

Medard, G. (2015). *Regenerative Development: Going Beyond Sustainability*. Kosmos Journal. https://www.kosmosjournal.org/article/regenerative-development-going-beyond-sustainability

Müller, E. (2015). *Regenerative development, the way forward to saving our civilization*. http://www.ucipfg.com/REP/152/1523/00IUL/U2/01.pdf

muell813. (2015, July 15). *Primary, Secondary, and Tertiary Sources*. University of Minnesota Crookston. https://crk.umn.edu/library/primary-secondary-and-tertiary-sources#:~:text=Sources%20of%20information%20or%20evidence

Neelakantan, S. (2019, December 12). *How K–12 Schools Can Use Technology to Combat Absenteeism*. Technology Solutions That Drive Education. https://edtechmagazine.com/k12/article/2019/12/how-k-12-schools-can-use-technology-combat-absenteeism

Polaris. (n.d.). *Project Integration Management - A Comprehensive Guide.* Replicon. Retrieved October 23, 2022, from https://www.replicon.com/polaris-psa/project-integration-management/

Prakash, V. (2016, July 22). *Dealing with Integrated Change Control–Part 2 | pmwares*. Https://Pmwares.com/Dealing-Integrated-Change-Control-Part-2/. https://pmwares.com/dealing-integrated-change-control-part-2/

Project Management Institute. (2017). *A guide to the Project Management Body of Knowledge: (PMBOK® guide)* (6th ed.). Project Management Institute.

Project Management Institute. (2021). *A Guide to the Project Management Body of Knowledge (PMBOK® Guide) – Seventh Edition and The Standard for Project Management*. Project Management Institute.

QuestionPro. (2018, August 14). *Experimental Research- Definition, Types of Designs and Advantages | QuestionPro*. QuestionPro. https://www.questionpro.com/blog/experimental-research/

Rosowsky, D. (2022, March 2). *The Role Of Research At Universities: Why It Matters*. Forbes. https://www.forbes.com/sites/davidrosowsky/2022/03/02/the-role-of-research-at-universities-why-it-matters/?sh=4ef3473e6bd5

Rubicon. (2021, April 26). *What is Sustainable Technology? | Rubicon*. Www.rubicon.com. https://www.rubicon.com/sustainability-hub/articles/what-is-sustainable-technology/

Sadh, V. G. (2019). Green Technology in Education: Key to Sustainable Development. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3368186

Sagar, N. (2017, April 10). *How Important Is Technology In Education For Student Engagement?* Excellent Webworld. https://www.excellentwebworld.com/how-important-is-technology-in-education/

Shenoy, S. (2013, January 9). *Introduction To Project Management Body of Knowledge (PMBOK-6)*. Www.pmexamsmartnotes.com. https://www.pmexamsmartnotes.com/project-management-body-of-knowledge/

Srinivasan, B. (2018, March 4). *Based on PMBOK Guide 6th Edition*. Project Management & Leadership Champions. https://leadershipchamps.wordpress.com/project-management-mind-maps/based-on-pmbok-6th-edition/

UNDP. (2022). *Sustainable Development Goals | United Nations Development Programme*. Www.undp.org. https://www.undp.org/sustainable-development-goals#:~:text=The%20Sustainable%20Development%20Goals%20(SDGs)%2C%20also%20known%20as%20the

Unwin, T. (2019). The Future Use of Technology in Education and Learning in the Commonwealth. *The Round Table*, *108*(4), 447–458. https://doi.org/10.1080/00358533.2019.1634891

Vasiliauskas, V. (2021, July 27). *Hybrid Project Management: What is it, Methodology & Software*. Teamhood. https://teamhood.com/project-management-resources/hybrid-project-management

Sadh, V. G., Green Technology in Education: Key to Sustainable Development (April 8, 2019). Proceedings of Recent Advances in Interdisciplinary Trends in Engineering & Applications (RAITEA) 2019, Available at SSRN: https://ssrn.com/abstract=3368186 or http://dx.doi.org/10.2139/ssrn.3368186

Walden University. (2019, February 5). *Top 5 benefits of technology in the classroom*. Waldenu.edu; Walden University. https://www.waldenu.edu/programs/education/resource/top-five-benefits-of-technology-in-the-classroom

Wells, M. (2022, October 5). *Project Integration Management - IT Development*. Grist Project Management. https://www.gristprojectmanagement.us/it-development/project-integration-management.html

Yarbrough, Q. (2021, May 18). *Project Definition: The Meaning of a Project*. ProjectManager.com. https://www.projectmanager.com/blog/project-definition

Zongola, K. (2015, December 8). *LibGuides: Information Literacy Guide: Types of Information Sources*. Ufh.za.libguides.com. https://ufh.za.libguides.com/c.php?g=91523&p=590868

Explanation of Bibliographical Research

The material that was presented in the Bibliography reflected the outcome desired if the project followed the path outlined in the Project Charter. Evidence provided suggested that positive outcomes exist for the inclusion of technology in schools and the provision of adequate resources to support the teaching learning environment.

A data driven organization is one that makes sound judgment based on facts and not suppositions. The book entitled, "Communicating with *data: Making your case with data"* (Allchin, 2022), provides a basis for the administration and staff of the Ciceron Secondary School to develop a data culture and embrace data literacy which results in informed decision making and programme development.

Project sustainability has been highly anticipated outcome by stakeholders. It has encouraged stakeholders to form partnerships, foster collaboration and become innovative in their efforts to stimulate learners. The research shows that sustainability and sustainable technologies in education must be addressed in by school administrators.

Consultores (2022), stated that, the benefits of technology in the teaching-learning environment can be summarized in four ways:

1. Providing tools to enhance learning;
2. Giving students and faculty more opportunities for feedback, reflection, and review;
3. Building bridges between schools, universities and communities including faculty, administrators, students, practicing scientists and other stakeholders; and
4. Expanding opportunities for teacher training.

This summarized the essence of the project. The outcome being improved attendance, performance, morale, environment and resources.

APPENDIX 5: FGP PHILOLOGIST LETTER

CHRISENTIA COMBIE
REUNION
CHOISEUL
EDITOR AND EDUCATOR

06/01/2023

Academic Advisor,

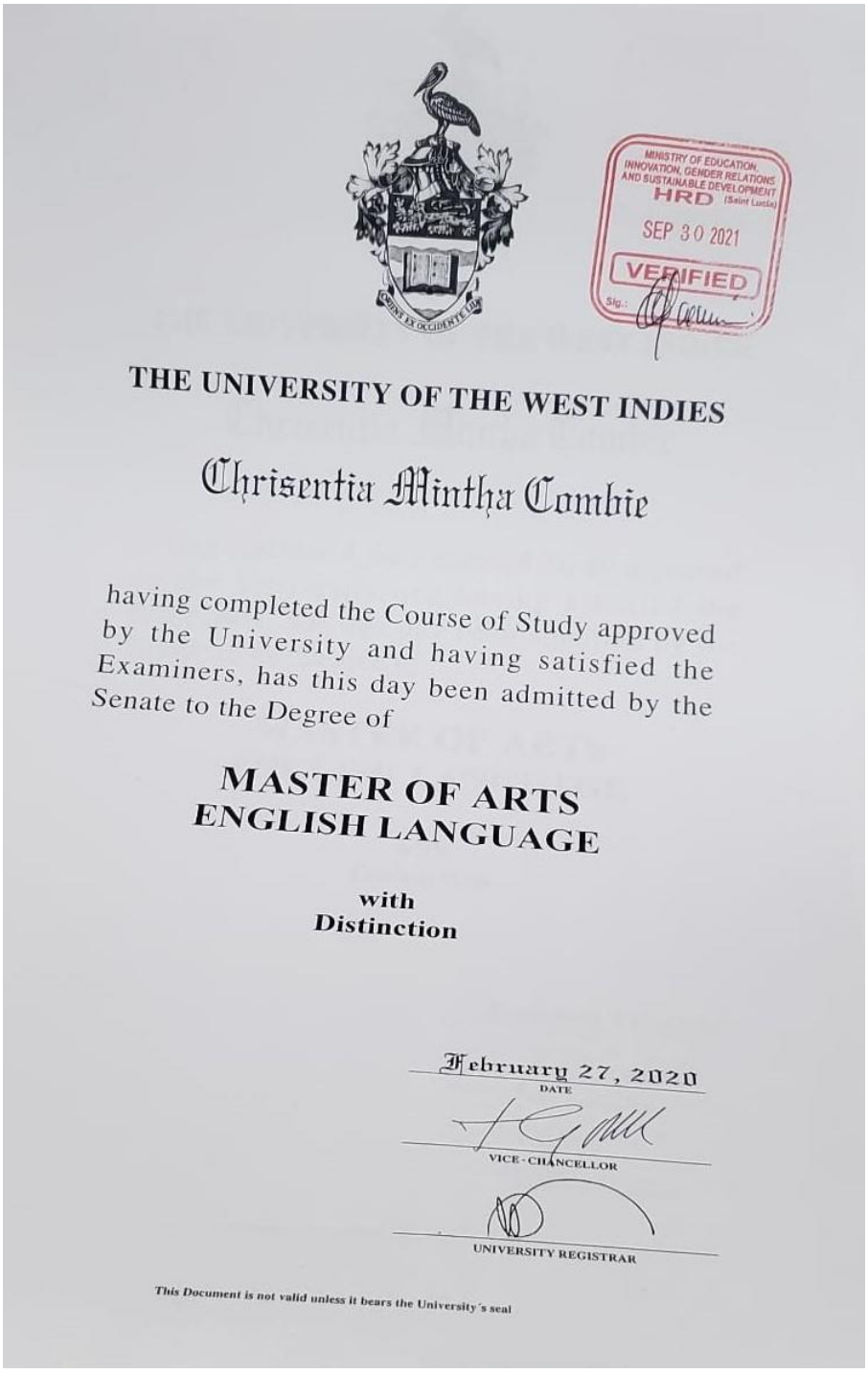
Re: Philosophical Review of Final Graduation Project submitted by Yasmin Tyson in partial fulfillment of the requirements for the Masters in Project Management (MPM) Degree.

I hereby confirm that Yasmin Tyson has made all the corrections to the Final Graduate Project document as I have advised. In my opinion, the document does now meet the fundamental literary and linguistic standards expected of a student reading for a degree at the Masters level.

……

Chrisentia Combie
BEd (UWI) MA (UWI)
Soufriere Comprehensive Secondary School

APPENDIX 6: RELEVANT ACADEMIC QUALIFICATIONS OF THE PHILOLOGIST



MINISTRY OF EDUCATION, INNOVATION, GENDER RELATIONS AND SUSTAINABLE DEVELOPMENT
HRD (Saint Lucia)
SEP 30 2021
VERIFIED
Sig.:

THE UNIVERSITY OF THE WEST INDIES

Chrisentia Mintha Combie

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

with
Distinction

February 27, 2020
DATE

VICE-CHANCELLOR

UNIVERSITY REGISTRAR

This Document is not valid unless it bears the University's seal