UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL
(UCI)

TO DEVELOP A PROJECT MANAGEMENT PLAN FOR THE IMPROVEMENT OF THE LEARNING MANAGEMENT SYSTEM (LMS) VIRTUAL LEARNING PLATFORM IN THE BAHAMIAN SCHOOL SYSTEM FOR HYBRID LEARNING.

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DEDICATION

This project is dedicated and by extension my degree to my mother and brother. Thank you for being there through my greatest sweat, tears, and triumphs.

ACKNOWLEDGMENTS

I would like to thank the Almighty God for life, for strength and guidance.

Special thanks to my family and friends for their love and support when I needed it the most.

Thank you to my tutors, professors and the entire UCI family for their invaluable contributions to my education.

Finally, I would like to thank, my country, The Commonwealth of The Bahamas. The pride I have for having the privilege to be a citizen of such a great nation, to always strive to move "Forward, Upward, Onward, Together," will continue no matter where I reside.

ABSTRACT

The objective of this document is to develop a project management plan for the improvement of the Learning Management System (LMS) virtual learning platform in the Bahamian school system for hybrid learning. The current version of the learning management system cannot adequately meet the capacity load of both students and teachers logging on and undergoing sessions at the same time. Lessons are not innovative, additional resources are lacking, past examinations and their solutions are not readily available, and the self-paced quizzes have not been tailored to reflect the standard assessment given by the Ministry of Education.

The final product of this project consists of plans to ensure the improvement of the platform capacity, quality of the lessons and resources as well as the addition of more comprehensive practice examinations. This study is made up of the final deliverables of the project that correspond to the charter and the management plans for scope, schedule, cost, quality, resources, communications, risks, procurement, stakeholders, integration, risk and sustainability. For this study, a combination of descriptive, analytical, quantitative and qualitative research methods are used.

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ABBREVIATIONS AND ACRONYMS

BGCSE	**Bahamas General Certificate for Secondary Education**
BJC	**Bahamas Junior Certificate**
COVID-19	**Coronavirus Disease - 19**
EMIS	**Education Management Information System**
LMS	**Learning Management System**
PMBOK	**Project Management Body Of Knowledge**
PMI	**Project Management Institute**
WBS	**Work Breakdown Structure**

EXECUTIVE SUMMARY

In the twenty-first century, staying on the cutting edge of technology is vital for survival and success. With the world constantly changing and at the same time demanding the performance of each citizen to be at their highest, our education and training should be advancing also. At the beginning of the Coronavirus-19 (COVID-19), One on One established in 2013, entrusted by the Bahamian government to provide an Education Management Information System (EMIS). Empowered to fill the learning gap that was missing, One on One's EMIS and LMS, easy to use platforms was introduced to the Bahamian education system during a time when face to face learning was impossible due to the COVID-19 protocols.

Over the years, it was quite clear that the Learning Management System (LMS) could not support all students and teachers logging onto the platform at the same time. Users were having difficulty with integrating the LMS into their teaching and learning routine. Students were not progressing as they should and for those leaving the secondary system, that meant entering the professional world ill equipped.

The aim of this Final Graduation Project was to develop a project management plan for the improvement of the learning management system (LMS) virtual learning platform in the Bahamian school system to implement hybrid learning. One on One has been committed to providing a personalized online environment, which for our students meant equipping the platform with online tutors, lessons, quizzes and practice end of the semester exams. Additionally, the user capacity was expanded. The project management plan ensured that the project stayed on budget and was completed on time. Further, the plan ensured that the scope was clearly defined and that all the goals and objectives were met.

The general objective was to develop a Project Management Plan for the Improvement of the learning Management System (LMS) Virtual learning platform in The Bahamian School System to implement hybrid learning. The specific objectives were: to create the project charter and Integration Management Plan to ensure that all deliverables align cohesively; to develop the Scope Management Plan in order to ensure that the project includes all the work required to complete the project successfully; to develop the Cost Management Plan in order to keep the cost range inside the project cost constraint; to develop the Quality Management Plan in order to ensure all activities and tasks are done to maintain the desired level of excellence in relation to previously defined objectives; to develop the Resource Management Plan to ensure the resources necessary to complete the project successfully are utilized appropriately; to develop the Communications Management Plan to ensure open communication with all stakeholders; to develop the Risk Management Plan in order to plan, identify, analyze, respond and monitor risks on the project; to develop the Procurement Management Plan in order to detail all the requirements necessary to acquire the necessary goods, works and services to complete the project successfully; to develop the Stakeholder Management Plan to ensure all stakeholders are considered, and to develop the Schedule Management Plan to manage the timely completion of the project. To develop a Sustainability plan to develop and ensure sustainable objectives.

The methodology for this research was qualitative, quantitative, descriptive and analytical. Data was collected from the stakeholders through interviews, surveys, meetings and statistics from precious studies.

The Project Management Plan development process concluded developing the project management plan along with its subsidiary plans for the proposed learning management system would assist in creating the final product in time, within budget and remain in scope. Without a proper plan project tend to either fail or not meet stakeholder requirements.

The following recommendations are directed to the Project Sponsor for future projects. The Ministry of Education should consider including the Private schools in their research to create a diverse data set. Other virtual learning platforms should also be considered to find the best suited one for the school. Now that a framework is established, the Ministry of Education can consider adjusting the Project's timeline and budget restrictions. Communication should always remain key and keeping critical stakeholders' interest and involvement as a priority throughout the project is vital to its success. However, any additions made, improvement or otherwise must comply with international education standards.

1 INTRODUCTION

1.1. Background

One on One, established in August 2013 has helped empower more than 1,000,000 Caribbean nationals to learn and take their exams online, laying the foundation for rapid skills acquisition for several subject areas and business skills.

One On One's founder in 2013, wanted to fill a massive learning gap that was noticed in the Caribbean. Since then, One on One has worked with an amazing team to provide digital learning solutions to over 150,000 learners. The One On One team works together to create an easy-to-use platform that empowers users to upgrade their skills through personalised learning solutions. They are committed to closing knowledge gaps while creating opportunities for economic and social transformation through building a globally competitive workforce in the region.

One on one also provides personalised online learning solutions to over 150,000 learners across the Caribbean. The learning solutions cover all stages of the educational journey from secondary education to employee training in enterprises. Its clients benefit from our e-learning courses, online training, instructional design services, and expert tutors and trainers. People in over 10 Caribbean countries use these solutions to simplify learning and development.

One on One has been entrusted by the Jamaican and Bahamian governments to provide an Education Management Information System (EMIS) that powers the growth of their students. The EMIS helps governments collect and manage all the data related to educating their nation's children. This data has been used by both the Jamaican and Bahamian governments to inform improvements to their education systems ("What we do?," 2023).

1.2. Statement of the problem

The COVID-19 pandemic has hit every country in the world, forcing complete shutdowns in business, education, religion and recreational activities such as the beaches. For most of the world, day to day routines returned to somewhat normal, however for the Caribbean and the Latin American region, lockdowns and restrictions remained in place for over a year and a half. During this time, students remained out of school, many of which were not receiving formal or informal education.

Students entering the school system currently were at a disadvantage due to never being in a classroom. Those leaving the junior and senior school systems were left unprepared to sit their final exams for the Bahamas Junior Certificate (B.J.C) and the Bahamas General Certificate of Secondary Education (B.G.C.S.E). Teachers had to get creative while the Ministry of Education caught up to the implementation of technology in the classroom on a wide scale.

A personalised e-learning platform that connects students to the best tutors or teachers and resources to achieve academic success is what was needed. A learning management system (LMS) is a software application that provides a seamless process for asynchronous and real time virtual training. A hub for course material people can access anytime, anywhere. A system that allows for Gamification, that is online training made fun through competitions, leaderboards, badges, points, and other incentives. Technology at its finest for learning that is zero rated for internet use so students and teachers alike will not be limited due to services on the devices already provided by the Ministry of Education and Corporate Bahamas. There would be no break in students' learning with a platform that is well equipped to handle the visitor load and is constantly updating to meet the needs of these shareholders.

A project management plan for the improvement of the learning management system (LMS) virtual learning platform in the Bahamian school system will aid in the success of to implement hybrid learning. All necessary stakeholders, including the developer, students and teachers will be assured that the scope of the project is followed, the project will remain on budget and will be completed on time.

1.3. Purpose

The purpose of this project is to establish a project management plan that will improve the Learning Management System (LMS) in the Bahamian Education System for hybrid learning. This project management plan will carry out a typical project life cycle; initiating, planning, monitoring and control and closing. The ten (10) knowledge areas will be included as well as consideration of its sustainability.

The current system is inadequate to maintain the heavy traffic as more people are better able to access the platform as demonstrated by the significant system crashes. With a budget of over $1 million dollars each year in the education system the government has more than sufficient resources to ensure that the education it provides to the nation's youth is the best quality available, featuring the latest technology. This will help ensure that our students are able to meet international standards. COVID-19 has demonstrated that the traditional ways of teaching and communicating have limits when faced with a pandemic that hinders face to face interactions. Blended learning not only ensures that measures are always in place when face to face learning is not possible, but it heightens the experience for all stakeholders and improves performance for all concerned.

Therefore, this project management plan will detail the procedures for a project manager to follow for the creation of this virtual learning system that will be completed within the allotted budget, time frame and with the intended scope.

1.4. General objective

To develop a Project Management Plan for the Improvement of the learning Management System (LMS) Virtual learning platform in The Bahamian School System to implement hybrid learning.

1.5. Specific objectives

1. To develop the Project Charter to ensure that all deliverables align cohesively.
2. To develop the Scope Management Plan in order to ensure that the project includes all the work required to complete the project successfully.
3. To develop the Cost Management Plan in order to keep the cost range inside the project cost constraint.
4. To develop the Quality Management Plan in order to ensure all activities and tasks are done to maintain the desired level of excellence in relation to previously defined objectives.
5. To develop the Resource Management Plan to ensure the resources necessary to complete the project successfully are utilized appropriately.
6. To develop the Communications Management Plan to ensure open communication with all stakeholders.

7. To develop the Risk Management Plan in order to plan, identify, analyze, respond and monitor risks on the project.

8. To develop the Procurement Management Plan in order to detail all the requirements necessary to acquire the necessary goods, works and services to complete the project successfully.

9. To develop the Stakeholder Management Plan to ensure all stakeholders are considered.

10. To develop the Schedule Management Plan to manage the timely completion of the project.

11. To develop a Sustainability plan to develop and ensure sustainable objectives.

2 THEORETICAL FRAMEWORK

2.1 Company/Enterprise framework

2.1.1 Company/Enterprise background

The study disclosed that almost one half of the young people surveyed who were not attending classes regularly (47 percent) were unable to sign on to the Ministry's LMS or were experiencing chronic challenges. This statistic gave credibility to widespread feedback from teachers and students, many of whom expressed difficulty and frustration and this survey subsequently informed the rationale for renewed approach to the system. (McKenzie, 2022)."

With many of the findings from various studies repeating the results outlined in the previous paragraph, swift action must take place. The need for a project management for the improvement of the LMS in the Bahamian school system is critical to the students' improvement and academic success.

2.1.2 Mission and vision statements

Company Mission Statement

Guided by the universal principles of truth, justice, honesty, diligence and respect for the individual, the Ministry of Education will provide all persons in The Bahamas with opportunities to receive quality education equipping them with the knowledge, skills, beliefs, values and attitudes required to work and live in an interdependent, changing world. This mission statement is aligned with One on One, the company responsible for the learning management system. The One on One mission statement, 'Making knowledge acquisition easier by developing adaptative technology and content to personalize online learning experiences ("About us," 2022).

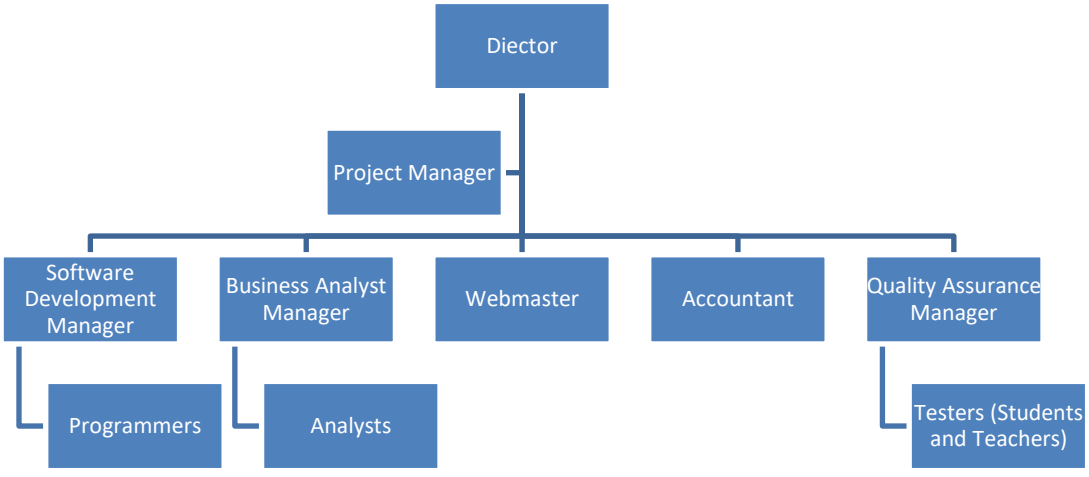
Company Vision Statement

The Ministry of Education vision is for a Bahamian education system that promotes the highest standards and produces students who are intellectually curious, compassionate, responsible and capable of making a meaningful contribution to the country's productivity, prosperity and peace. The vision statement for the One on One company is 'to become the global leader in the creation and delivery of personalized and impactful online learning experiences for individuals, companies and governments ("About us," 2022).

Therefore, in keeping with the mission and vision statement, the improvement of the LMS and the implementation of a blended/hybrid education system in not required but necessary in today's changing world. These statements align with the objectives of this project which inevitably will empower students with the tool necessary to gain the best education possible.

2.1.3 Organizational structure

Figure 1 Organizational structure (Source: Author of Study)



(Source: Author of Study)

2.1.4 Products offered

The LMS has been tailored to the needs of the Bahamian education system given its geographical location and the present climate of the world. By establishing a project management plan, it can be assured that all stakeholders involved needs will be met.

2.2 Project Management concepts

2.2.1 Project management principles

The 12 principles listed below provide guidance for effective project management.

1. Be a Diligent, Respectful, and Caring Steward

2. Create a Collaborative Project Team Environment

3. Effectively Engage with Stakeholders

4. Focus on Value

5. Recognize, Evaluate, and Respond to System Interactions

6. Demonstrate Leadership Behaviors

7. Tailor Based on Context

8. Build Quality into Processes and Deliverables

9. Navigate Complexity

10. Optimize Risk Responses

11. Embrace Adaptability and Resiliency

12. Enable Change to Achieve the Envisioned Future State (PMI, 2021, p. 23).

2.2.2 Project management domains

A project performance domain is a group of related activities that are critical for the effective delivery of project outcomes. Project performance domains are interactive, interrelated, and interdependent areas of focus that work in unison to achieve desired project outcomes.

The 8 Project Performance Domains are:

1.Stakeholders.

2.Team.

3.Development Approach and Life Cycle.

4.Planning.

5.Project Work.

6.Delivery.

7.Measurement.

8.Uncertainty (PMI, 2021, p. 7).

2.2.3 Predictive, adaptative and hybrid projects

Predictive project management refers to when the scope of work and requirements for the project are clear and justify the detailed upfront planning. Predictive project management called “traditional”, “conventional”, or “Waterfall” project management ("Predictive & adaptive project management | What are they?," n.d.).

Adaptive is when the scope of work and requirements for the project are difficult to define, therefore creating a rapidly changing environment.

Requirements are clarified in short iterations (cycles) and therefore require an Agile approach. Adaptive project management can also be referred to as “responsive” or “iterative”. It is most

often simply called Agile project management, “Agile thinking”, or “an Agile approach” ("Predictive & adaptive project management | What are they?," n.d.).

Predictive and adaptive approaches can work extraordinarily well together. Project teams everywhere are doing more and more – choose a hybrid of methodologies to get the best result for your project. For example, PRINCE2® works extremely well when combined with Agile. The solid structure of PRINCE2® combined with the flexibility of Agile can support a project requiring a blend of predictive and adaptive influences. The PMI’s PMBOK® Guide framework includes a consideration for Agile, giving room to incorporate elements of adaptive into your predictive project work ("Predictive & adaptive project management | What are they?," n.d.).

2.2.4 Project management

The PMBOK® Guide defines Project Management as “the application of knowledge, skills, tools, and techniques to project activities to meet project requirements. Project management is accomplished through the appropriate application and integration of the project management processes identified for the project (PMI, 2017, p.542).

A project management plan will therefore be instrumental in ensuring that the scope, budget and timeline of the project is followed to increase the likelihood of improvement for the LMS project.

2.2.5 Project management knowledge areas and processes

A knowledge area is a set of processes associated with a particular topic in project management. These 10 Knowledge Areas are used on most projects most of the time, include; Project Integration Management, Project Scope Management, Project Schedule Management, Project Cost Management, Project Quality Management, Project Resource Management, Project

Communications Management, Project Risk Management, Project Procurement Management and Project Stakeholder Management (PMI, 2017, p.553).

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, p.553). Utilizing this knowledge area would allow the project manager to ensure the project is cohesive.

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, p.553). The project manager will be able to use this knowledge area to ensure that the scope is achieved.

Project Schedule Management includes the processes required to manage the timely completion of the project (PMI, 2017, p.553). This knowledge area will aid the project manager in keeping the project on the established timeline to ensure that it is completed on time.

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 (PMI, 2017, p.553). The project manager will use this knowledge area to keep the project from going over budget.

Project Quality Management includes the processes to incorporating the organization's quality policy regarding planning, managing, and controlling project and product quality requirements, in order to meet stakeholders' expectations (PMI, 2017, p.553). It is not sufficient to simply improve the LMS if the issues that the stakeholders previously faced have not been resolved. The Project Manager can use this knowledge area to ensure that the best quality LMS is created.

Project Resource Management includes the processes to identify, acquire, and manage the resources needed for the successful completion of the project (PMI, 2017, p.553). This knowledge area will ensure that all the staff, materials, and various components necessary for this project are in place for its successful completion.

Project Communications Management includes the processes required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring, and ultimate disposition of project information (PMI, 2017, p.553). The

project manager will use this knowledge area to ensure that communication is sufficient, timely and maintained throughout the entire project.

Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project (PMI, 2017, p.553). The project manager will use this knowledge area to ensure that any events that can decrease the success of the project are minimized and the events that can increase the success of the project is maximized.

Project Procurement Management includes the processes necessary to purchase or acquire products, services or results need from outside the project team (PMI, 2017, p.553). This knowledge area will ensure that the project manager acquires the specific resources necessary for the success of this LMS project.

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 (PMI, 2017, p.553). The project manager will use this knowledge area to ensure that communication to and amongst the stakeholders is appropriate based on their priority level.

2.2.6 Project life cycle

According to the PMBOK Guide, Project Management processes are grouped in five Management Process Groups:

1. Initiating Process Group: the process(es) performed to define a new phase of an existing project by obtaining authorization to start the project or phase.
2. Planning Process Group: the process(es) 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: The process(es) performed to complete the work defined in the project management plan to satisfy the project requirements.

4. Monitoring and Controlling Process Group: The process(es) required to track, review, and regulate the progress and performance of the project; identify any areas in which changes to the plan are required,

5. Closing Process Group: The process(es) performed to formally complete or close a project, phase, or contract (p. 554).

Figure 2 Project Life Cycle

(Source: Project life cycle: 5 phases of project management, 2021)

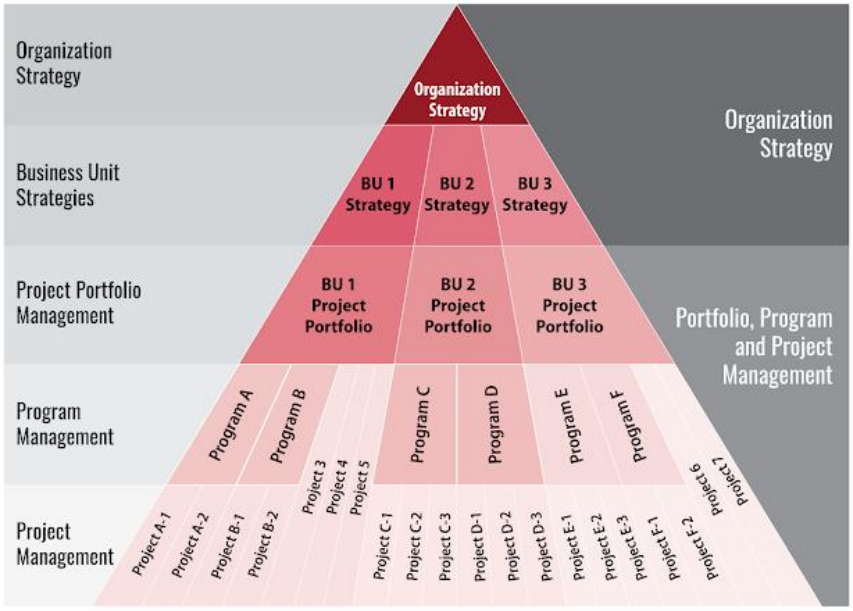
2.2.7 Project Management Concepts

The figures below illustrate the relationship between an organization, portfolio, program, and project. Figure 3 shows a project at the lowest level of the pyramid. A project is temporary, and its objective is to produce a product. A program is a group of projects that contribute to the business objectives and goals. A portfolio is a collection of projects and programs grouped together to achieve strategic objectives of the company and allows the leaders to make the right decisions. With each strategic objective, there exists a portfolio to achieve this strategy shown in Figure 4.

Figure 3 The relationship between the three P's of Project Management.

(Source ("Project ≠ program ≠ portfolio ≠ strategy," 2020)

Figure 4 The relationship between the three P's of Project Management and Organization



(Source: ("Project ≠ program ≠ portfolio ≠ strategy," 2020)

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

2.3.1 Current situation of the problem or opportunity in study

The COVID-19 pandemic has hit every country in the world, forcing complete shutdowns in business, education, religion and recreational activities such as the beaches. For most of the world, day to day routines returned to somewhat normal, however for the Caribbean and the Latin American region, lockdowns and restrictions remained in place for over a year and a half. During this time, students remained out of school, many of which did not receive formal or informal education. Teachers had to get creative while the Ministry of Education caught up to the implementation of technology in the classroom on a wide scale.

The current system is inadequate to handle the heavy traffic, as more people are gaining better access to the platform, resulting in significant system crashes. With a budget of over $1 million dollars each year in the education system, the government has more than sufficient resources to ensure that the education it provides to the nation's youth is of the highest quality, featuring the latest technology. This will help ensure that our students are able to meet international standards. COVID-19 has demonstrated that traditional teaching and communication methods have limitations when faced with a pandemic that hinders face-to-face interactions. Blended learning not only ensures that measures are always in place when face-to-face learning is not possible, but also enhances the learning experience for all stakeholders and improves overall performance.

What is needed is a personalized e-learning platform that connects students to the best tutors or teachers and provides resources for academic success. A learning management system (LMS) is a software application that provides a seamless process for asynchronous and real-time virtual training. It serves as a hub for course materials that people can access anytime, anywhere. The

system should also allow for gamification, which is the use of online training made fun through competitions, leaderboards, badges, points, and other incentives. Additionally, the platform should be well-equipped to handle high visitor loads and constantly update to meet the needs of all stakeholders. A project management plan for improving the learning management system (LMS) virtual learning platform in the Bahamian school system will contribute to the successful implementation of hybrid learning.

2.3.2 Previous research done for the topic in study

Now more than ever, it is imperative to find ways to educate the next generation in a way that incorporates the ever-changing dynamics outside the classroom. Flexibility is key and by Integrating virtual learning and traditional teaching, students would be better equipped to function academically, should another pandemic hit or simply thrive under normal circumstances because adequate help is readily available (Zamri et al., 2021). With the addition of the internet, learning can take place anywhere. The implementation of a better blended learning system provides access for a better-quality communication interaction and resources (Jawad et al., 2022).

It has been found that intensively integrating the virtual learning platform into formal education has had significant impact on students' performance (Kliziene et al., 2021). After the last two years with the difficulties faced from the COVID-19 pandemic, studies have shown that it would be in the best interest of the education system to invest more on online education platforms to maintain academic continuity, especially during times of emergency (Adeyeye et al., 2022). These systems resulted in learning gains, overall participation satisfaction and an

increased motivation by the students to learn (Felszeghy et al., 2019). Blended learning is an excellent tool to know students better and consequently, develop strategies which meet their interests and needs (Alves et al., 2017). The platform allows students to practice self-efficacy by exposing them to activities where feedback is readily available when errors are made without the negative outcomes that result from a lack of understanding which can result in enhanced performance over the course of learning (Kolil et al., 2020).

2.3.3 Other theory related to the topic in study

Teachers and students agree that blended learning enhances learning and performance and can be applied across most disciplines (Li et al., 2021). This type of environment makes it possible to reach more students when it is impossible to meet physically for a variety of reasons such as capacity or weather, it provides access to teaching resources and makes it easier to monitor the activity of the teaching staff and of the interactions between students and teachers. Furthermore, online environments make it possible to assess the factors that cause the students' academic performance to increase or decrease (Rivas et al., 2021).

3 METHODOLOGICAL FRAMEWORK

3.1 Information sources

According to the McGraw-Hill Dictionary of Scientific and Technical Terms, an Information Source is “any system producing information or containing information intended for transmission; in information science, the conventional designation for scholarly documents or publications, which serve not only as important sources but also as the means of transmission of information in space and time (2003).

3.1.1 Primary sources

Primary information sources chiefly contain new scholarly information or a new comprehension of known ideas and facts, such as books (excluding handbooks), periodicals and serials, special kinds of technical publications, scientific-technical reports, dissertations, and information charts (The McGraw-Hill Companies, 2003).

Examples of Primary Sources include:

- Texts of laws and other original documents.
- Newspaper reports, by reporters who witnessed an event or who quote people who did.
- Speeches, diaries, letters and interviews-what the people involved said and wrote.
- Original research.
- Datasets, survey data, such as census or economic statistics.
- Photographs, video, or audio that capture an event ("Research guides: Primary sources: A research guide: Primary vs. secondary," 2022).

For this project, interviews will be conducted with several people involved in the Learning Management System program as well as field work and datasets obtained from census and newspaper reports.

3.1.2 Secondary sources

Secondary information sources contain for the most part information from primary documents or about them, such as reference literature, surveys, journals of abstracts, library catalogs, and bibliographical indexes and card catalogs (The McGraw-Hill Companies, 2003).

Examples of Secondary Sources include:

- Books.
- Analysis or interpretation of data.
- Scholarly or other articles about a topic, especially by people not directly involved.
- Documentaries ("Research guides: Primary sources: A research guide: Primary vs. secondary," 2022)

For this project all documentation found in the Improvement in Virtual Learning Platform Project the Learning Management System will be analyzed, with emphasis on information obtained from books, journal articles and websites covering virtual learning platforms and its advantages.

Chart 1: Information sources

Objectives	Information sources	
	Primary	**Secondary**
To create the project charter in order to define the key input elements to develop the project management plan.	PMBOK Guide, discussion with the stakeholders (teachers, students, school administrators)	Research data, Journals, Internet resources
To develop the Scope Management Plan in order to ensure that the project includes all the work required to complete the project successfully.	PMBOK Guide, discussion with the stakeholders (teachers, students, school administrators)	Research data, Journals, Internet resources
To develop the Cost Management Plan in order to keep the cost range inside the project cost constraint.	PMBOK Guide, Datasets	Journals, Internet resources
To develop the Quality Management Plan in order to ensure all activities and tasks are done to maintain the desired level of excellence in relation to previously defined objectives.	PMBOK Guide, Internet resources	Journals
To develop the Resource Management Plan to ensure	PMBOK Guide, discussion with the	Journals, Internet resources

the resources necessary to complete the project successfully are utilized appropriately.	stakeholders (teachers, students, school administrators)	
To develop the Communications Management Plan to ensure open communication with all stakeholders.	PMBOK Guide, Internet resources	Journals, Internet resources
To develop the Risk Management Plan in order to plan, identify, analyze, respond and monitor risks on the project.	PMBOK Guide, internet resources	Journals, Internet resources
To develop the Procurement Management Plan in order to detail all the requirements necessary to acquire the necessary goods, works and services to complete the project successfully.	PMBOK Guide, internet resources	Journals, Internet resources
To develop the Stakeholder Management Plan to ensure all stakeholders are considered.	PMBOK Guide, discussion with the stakeholders (teachers, students, school administrators)	Journals, Internet resources
To develop the Schedule Management Plan to	PMBOK Guide	Research data, Journals, Internet resources

manage the timely completion of the project.		
To develop a Sustainability plan to develop and ensure sustainable objectives.	Sustainable Project Management: The GPM Reference Guide	Journals, Internet resources

(Source: Author of Study)

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: Research methods: What are research methods?," 2022).

Example:

3.2.1 Qualitative research method

Qualitative research is a process of naturalistic inquiry that seeks an in-depth understanding of social phenomena within their natural setting. It focuses on the ‘why’ rather than the ‘what’ of social phenomena and relies on the direct experiences of human beings as meaning-making agents in their everyday lives. Rather than by logical statistical procedures, qualitative researchers use multiple systems of inquiry for the study of human phenomena including biography, case study, historical analysis, discourse analysis, ethnography, grounded theory, and phenomenology ("Subject and course guides: Quantitative and qualitative research: What is qualitative research?," 2022).

3.2.2 Quantitative research methods

Quantitative research methods emphasize objective measurements and the statistical, mathematical, or numerical analysis of data collected through polls, questionnaires, ad surveys, or by manipulating pre-existing statistical data using computational techniques. Quantitative

research focuses on gathering numerical data and generalizing ("Research guides: Organizing your social sciences research paper: Quantitative methods," 2022).

3.2.3 Analytical Research Methods

Analytical research is a specific type of research that involves critical thinking skills and the evaluation of facts and information relative to the research being conducted. A variety of people including students, doctors and psychologists use analytical research during studies to find the most relevant information (Mohanlal Sukhadia University, n.d.).

3.2.4 Descriptive Research Methods

Descriptive research describes a population, situation, or phenomenon that is being studied. It focuses on answering the 'how, what, when, and where' questions rather than the 'why' (Mohanlal Sukhadia University, n.d.).

Chart 2: Research methods

Objectives	**Research methods**			
	Descriptive research	Analytical research	Quantitative research	Qualitative research
To create the project charter to ensure that all deliverables align cohesively.	Information will be gathered from surveys and interviews	Information would be analyzed from previous studies.	Empirical data would be gathered	Information will be gathered from interviews to investigate the why and how, not just the what, where when
To develop the Scope Management Plan in order to ensure that the project	Information will be gathered from surveys and interviews	Information would be analyzed from previous studies.	NA	NA

includes all the work required to complete the project successfully.				
To develop the Cost Management Plan in order to keep the cost range inside the project cost constraint.	Information will be gathered from surveys and interviews	Information would be analyzed from previous studies.	Empirical data would be gathered	NA
To develop the Quality Management Plan in order to ensure all activities and tasks are done to maintain the desired level of excellence in relation to previously defined objectives.	NA	NA	Empirical data would be gathered	An assessment will be made based on agreed upon quality standards
To develop the Resource	Information will be	NA	NA	NA

Management Plan to ensure the resources necessary to complete the project successfully are utilized appropriately.	gathered from surveys and interviews			
To develop the Communications Management Plan to ensure open communication with all stakeholders.	NA	NA	Empirical data would be gathered	NA
To develop the Risk Management Plan in order to plan, identify, analyze, respond and monitor risks on the project.	Information will be gathered from surveys	Information would be analyzed from previous studies.	Empirical data would be gathered using the Probability and Impact Matrix	Information will be gathered from interviews to investigate the why and how, not just the what, where and when
To develop the Procurement	Information will be	Information would be	NA	NA

Management Plan in order to detail all the requirements necessary to acquire the necessary goods, works and services to complete the project successfully.	gathered from interviews	analyzed from previous studies.		
To develop the Stakeholder Management Plan to ensure all stakeholders are considered.	Information will be gathered from interviews	Information would be analyzed from previous studies.	NA	NA
To develop the Schedule Management Plan to manage the timely completion of the project.	Information will be gathered from surveys and interviews	Information would be analyzed from previous studies.	Empirical data would be gathered	Information will be gathered from interviews to investigate the why and how, not just the what, where and when
To develop a Sustainability plan to develop	Information will be gathered from	Information would be analyzed from	Empirical data would be gathered	Information will be gathered from interviews to investigate

and ensure sustainable objectives.	surveys and interviews	previous studies.		the why and how, not just the what, where and when

(Source: Author of Study)

3.3 Tools

A research tool is defined as ‘a device, technology, procedure, biological material, reagent, computer system, computer software, or analytical technique that is developed to assist in the discovery, development, or manufacture of a qualified product or project ("Research tools," n.d.).
Chart 3: Tools

Objectives	**Tools**
To create the project charter and to ensure that all deliverables align cohesively.	Interviews, surveys and meetings
To develop the Scope Management Plan in order to ensure that the project includes all the work required to complete the project successfully.	Interviews, Surveys, Product analysis, WBS Generator software, Product review
To develop the Cost Management Plan in order to keep the cost range inside the project cost constraint.	Meetings, three-point estimating, project management software, cost aggregation
To develop the Quality Management Plan in order to ensure all activities and tasks are done to maintain the desired level of excellence in relation to previously defined objectives.	Cost-benefit analysis, flow charts, inspection

Objectives	Tools
To develop the Resource Management Plan to ensure the resources necessary to complete the project successfully are utilized appropriately.	Organizational charts
To develop the Communications Management Plan to ensure open communication with all stakeholders.	Communication requirements analysis, communication technology, communication methods
To develop the Risk Management Plan in order to plan, identify, analyze, respond and monitor risks on the project.	Meetings, brainstorming, cause and effect diagrams, SWOT analysis, risk probability and impact assessment, probability and impact matrix, risk categorization, strategies for negative risks or threats
To develop the Procurement Management Plan in order to detail all the requirements necessary to acquire the necessary goods, works and services to complete the project successfully.	Market research, meetings, independent estimates
To develop the Stakeholder Management Plan to ensure all stakeholders are considered.	Stakeholder analysis, meetings
To develop the Schedule Management Plan to manage the timely completion of the project.	Meetings, Project Management software, critical path method
To develop a Sustainability plan to develop and ensure sustainable objectives.	Sustainable Project Management: The GPM Reference Guide tools

(Source: Author of Study)

3.4 Assumptions and constraints

An Assumption ‘is a factor in the planning process that is considered to be true, real, or certain, without proof or demonstration’ (PMI, 2021, p.235).

A Constraint is ‘anything that restricts or dictates the actions of the project team. The so-called ‘Triple Constraint’-the ‘triangle’ of time, cost and scope – are the big hitters, and every project drivers has one or two, if not all three project constraints ("Defining project constraints," 2011).

Chart 2: Assumptions and constraints

Objectives	Assumptions	Constraints
To create the project charter to ensure that all deliverables align cohesively.	The required products and services are acquired and available.	The final product must meet the user standards
To develop the Scope Management Plan in order to ensure that the project includes all the work required to complete the project successfully.	The work and activities are sufficiently detailed	The scope of the project must be adhered to without deviation
To develop the Cost Management Plan in order to keep the cost range inside the project cost constraint.	The budget will be accurately calculated to suit the scope of the project	The project remains within the allotted budget
To develop the Quality Management Plan in order to ensure all activities and tasks are done to maintain the desired level of excellence in relation to previously defined objectives.	Quality standards will be used to test the product	The final product must meet the user standards
To develop the Resource Management Plan to ensure the resources necessary to complete the project successfully are utilized appropriately.	The required staff complement is	Resources may not be available when needed

Objectives	Assumptions	Constraints
	available to perform the tasks	
To develop the Communications Management Plan to ensure open communication with all stakeholders.	Communication amongst all the stakeholders is relevant and up-to-date	Communication is dependent on a third party such as an internet service provider
To develop the Risk Management Plan in order to plan, identify, analyze, respond and monitor risks on the project.	All risks that will affect the project are listed	Unforeseen risks are liable to develop as the project progresses
To develop the Procurement Management Plan in order to detail all the requirements necessary to acquire the necessary goods, works and services to complete the project successfully.	The required products and services are acquired. The necessary products such as software and hardware are available	Goods and services are subject to external parties
To develop the Stakeholder Management Plan to ensure all stakeholders are considered.	All stakeholders are identified and categorized accordingly	Stakeholder requirements and level of interest may change during the project
To develop the Schedule Management Plan to manage the timely completion of the project.	Adequate time is allotted to	The project must be completed within

Objectives	Assumptions	Constraints
	complete the activities of the project	the time scheduled
To develop a Sustainability plan to develop and ensure sustainable objectives.	The required sustainable products and services are acquired	The project must be completed within sustainable guidelines.

(Source: Author of Study)

3.5 Deliverables

The PMI defines a deliverable as ‘any unique and verifiable product, result, or capability to perform a service that must be produced to complete a process, phase, or project (PMI, 2021).

Chart 5: Deliverables

Objectives	Deliverables
To create the project charter to ensure that all deliverables align cohesively.	Project Charter
To develop the Scope Management Plan in order to ensure that the project includes all the work required to complete the project successfully.	Scope Management Plan
To develop the Cost Management Plan in order to keep the cost range inside the project cost constraint.	Cost Management Plan
To develop the Quality Management Plan in order to ensure all activities and tasks are done to maintain the desired level of excellence in relation to previously defined objectives.	Quality Management Plan

Objectives	Deliverables
To develop the Resource Management Plan to ensure the resources necessary to complete the project successfully are utilized appropriately.	Resource Management Plan
To develop the Communications Management Plan to ensure open communication with all stakeholders.	Communications Management Plan
To develop the Risk Management Plan in order to plan, identify, analyze, respond and monitor risks on the project.	Risk Management Plan
To develop the Procurement Management Plan in order to detail all the requirements necessary to acquire the necessary goods, works and services to complete the project successfully.	Procurement Management Plan
To develop the Stakeholder Management Plan to ensure all stakeholders are considered.	Stakeholder Management Plan
To develop the Schedule Management Plan to manage the timely completion of the project.	Schedule Management Plan
To develop a Sustainability plan to develop and ensure sustainable objectives.	Sustainability Plan

(Source: Author of Study)

4 RESULTS

4.1. Project Charter

The Project Management Plan for the Final Graduation Project, “The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System” was completed using the processes and activities to identify, define, combine, unify, and coordinate the various processes and project management activities within the Project Management Process Groups (PMBOK, 2017).

The Project Integration Management processes are; Develop Project Charter, Develop Project Management Plan, Direct and Manage Project Work, Manage Project Knowledge, Monitor and Control Project Work, Perform Integrated Change Control and Close Project or Phase. Of these seven knowledge areas under the Integration Management Plan, the development of the Project Charter was important to define the project work required for it to be successful and approved. The data presented was obtained through interviews and publications.

The Project Charter was developed using a template provided by the University for International Cooperation (UCI). The tools and techniques used to develop the Project Charter were observation, expert judgement, publications and surveys.

The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System

PROJECT CHARTER

Nassau

The Bahamas

16 January 2023

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4.1.1 Introduction

The project, “The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System” is a project initiative being undertaken to improve the education system with hybrid learning. This project aims to implement these changes based on the struggles experienced during Virtual learning within face

learning restricted due to the Coronavirus COVID-19 Pandemic. The project will focus on strengthening the number of people able to use the platform at one time, expanding the learning resources available for students to study asynchronously or synchronously while making learning fun through gamification. This project hopes that with the collaboration with key stakeholders, a lasting effect will be felt on the educational system.

4.1.2 Purpose

The purpose of this project is to establish a project management plan that will improve the Learning Management System (LMS) in the Bahamian Education System.

4.1.3 Scope

The proposed project will improve the Learning Management System (LMS) in the Bahamian Education System. The project will see to it that the virtual learning platform will be able to maintain the heavy traffic as more people are better able to access the platform, with the latest technology available.

The Project Execution Schedule will consist of the following milestones:

1. Systems Engineering
2. Project Initiation
3. Collect Sponsor Requirements
4. Meet with Sponsor and Establish Project Requirements/Scope
5. Project Defined
6. Market Research
7. Market Analysis Report
8. Conduct Product Research

9. Determine Software, Hardware, Security Requirements Specifications
10. Identify Key Stakeholders
11. Conduct interviews/focus group sessions to capture Stakeholder requirements
12. Business Requirements Report
13. Product Defined
14. System Design
15. User Interface Design
16. Website design
17. Instructional Design
18. Security Design
19. Build Phase
20. Website build
21. Testing
22. Marketing
23. All relevant Project Plans Completed

4.1.4 Intended Audience

This initiative has several key stakeholders who will benefit the most from the successful implementation of this project. These stakeholders include; The Bahamian Government, the students, teachers and school faculty and staff in the education system, the local communities, business places.

4.1.5 Overview

4.1.5.1 Project Title and Description

Project Title: The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System

Project Sponsor: The Bahamian Government and Private Investors

Project Manager: TBD

Location: Nassau, The Bahamas

Project duration: 6 Months

Budget: 10,000 USD

Project Description: To develop a Project Management Plan for the Improvement of the learning Management System (LMS) Virtual learning platform in The Bahamian School System to implement hybrid learning.

4.1.5.2 Business Case

The 2030 Agenda for Sustainable Development and the seventeen (17) sustainable developmental goals adopted by all United Nations Member States provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests ("17 goals," n.d.).

This project initiative is aligned with achieving SDG 4: Quality Education - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. COVID-19 has demonstrated that the traditional ways of teaching and communicating have limits when faced with a pandemic that hinders face to face interactions. Blended learning not only ensures that measures are always in place when face to face learning is not possible, but it heightens the experience for all stakeholders and improves performance for all concerned.

4.1.5.3 Pre-assigned Resources and Main Requirements

Provisions have been made for some important pre-assigned resources:

1. Dedicated funds for the creation of a new project team.
2. Tax incentives: duty and tax waiver on materials needed to complete the project.

Other requirements for the successful completion of the project include:

1. Competent and dedicated Project Manager and Project Team
2. Availability of adequate technical expertise and equipment
3. Secured funding.

4.1.5.4 Project Objectives, Deliverables, Risks, Constraints, and Assumptions

4.1.5.4.1 Objectives

1. To create the project charter to ensure that all deliverables align cohesively.
2. To develop the Scope Management Plan to ensure that the project includes all the work required to complete the project successfully.
3. To develop the Cost Management Plan to keep the cost range inside the project cost constraint.

4. To develop the Quality Management Plan to ensure all activities and tasks are done to maintain the desired level of excellence in relation to previously defined objectives.
5. To develop the Resource Management Plan to ensure the resources necessary to complete the project successfully are utilized appropriately.
6. To develop the Communications Management Plan to ensure open communication with all stakeholders.
7. To develop the Risk Management Plan in order to plan, identify, analyze, respond and monitor risks on the project.
8. To develop the Procurement Management Plan to detail all the requirements necessary to acquire the necessary goods, works and services to complete the project successfully.
9. To develop the Stakeholder Management Plan to ensure all stakeholders are considered.
10. To develop the Schedule Management Plan to manage the timely completion of the project.
11. To develop a Sustainability plan to develop and ensure sustainable objectives.

4.1.5.4.2 Project Deliverables

1. A project charter to ensure that all deliverables align cohesively.
2. A Scope Management Plan to ensure that the project includes all the work required to complete the project successfully.
3. A Cost Management Plan to keep the cost range inside the project cost constraint.
4. A Quality Management Plan to ensure all activities and tasks are done to maintain the desired level of excellence in relation to previously defined objectives.
5. A Resource Management Plan to ensure the resources necessary to complete the project successfully are utilized appropriately.

6. A Communications Management Plan to ensure open communication with all stakeholders.
7. A Risk Management Plan to plan, identify, analyze, respond and monitor risks on the project.
8. A Procurement Management Plan to detail all the requirements necessary to acquire the necessary goods, works and services to complete the project successfully.
9. A Stakeholder Management Plan to ensure all stakeholders are considered.
10. A Schedule Management Plan to manage the timely completion of the project.
11. A Sustainability plan to develop and ensure sustainable objectives.

4.1.5.4.3 Risks, Constraints, Assumptions

Chart 6 Project Risks, Constraints, Assumptions

Risks
1. A delay/fulfillment of government contributions might delay the project
2. Lack of labor for project completion possibly due to lack of adequate compensation, COVID outbreaks and other health conditions.
3. The Bahamas' geographical location makes it prone to strong hurricanes. With a strong hurricane season there will be a delay in work due to disruption in power and internet resources that might delay the deliverables development.
4. Scope Creep may occur should additional funding be sought to complete portions of the project that may be placed on the back burner due to budget constraints. There is a possibility that new funders may have new ideas for what the project should look like.
Constraints
1. Private schools will not be part of the analysis.

2. The LMS is the only virtual platform concerned by the project and the project will be executed on improving only elements of this platform.
3. The project must be executed in 3 months.
4. All upgrades to be added must comply with international education standards.
Assumptions
1. Information about the learning management system (LMS) in The Bahamas is organized and available.
2. All government entities are ready to collaborate for signing all documents and contracts.
3. All the local stakeholders are ready to be involved in the project.
4. Researcher time for the FGP will be at least 10 hours per week during the FGP development process.

(Source: Author of Study)

4.1.6 Project Stakeholders

Stakeholders are identified based on their direct and indirect involvement with the project as their level of influence/power and interest in the project. They are ranked using a 5-tier very low (1) to very high (5), in favor (+), against (-) and neutral (+/-).

Chart 7 Project Stakeholders

	Stakeholders	Interests	Level of Influence	Level of Interest
1	Sponsor	Improvement of the Learning Management System Virtual Learning Platform for hybrid learning in the Bahamian School system	5	5
2	Project Manager	The successful achievement of each project milestone and successful final project delivery by the agreed deadline and within	4	5

		budget. To effectively manage the team and other stakeholders.		
3	Management Team	Successful delivery of the project, on time. Skill development. Effective interaction among team members.	3	5
4	Website Developer	To design, test, and deliver a successful project with as few technical issues as possible.	4	5
5	Administrative Staff	Multiple resources that is accessible from one location containing real-time updates and ease of communication with the school administration, teachers, students and parents.	3	5
6	Faculty	Multiple resources that is accessible from one location containing real-time updates and ease of communication with the school administration, teachers, students and parents.	3	5
7	Students	Multiple resources that is accessible from one location containing real-time updates and ease of communication with the school administration, teachers and other students.	3	4
8	Parents	Multiple resources that is accessible from one location containing real-time updates and ease of communication with the school administration, teachers and other parents.	3	4

9	Ministry of Education	Improvement in students' performance and examination results. Increase in availability of resources to students no matter where they are located, they would receive the same information. Ease of communication among students, teachers, parents and administration.	2	4

(Source: Author of Study)

4.1.7 Project Authorization

_____ Date: _____

<Project Sponsor>

<Project Sponsor Title>

4.2. Scope Management Plan

As defined by the PMBOK Guide, the Project Scope Management Plan "includes all the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully. Managing the project scope is primarily concerned with defining and controlling what is and is not included in the project" (2017).

Project Scope Management follows a five-step process; Collect Requirements, Define Scope, Create WBS, Verify Scope, and Control Scope. The important inputs for this process are the project charter and the Quality Management Plan. The tools and techniques used include expert judgement, meetings, and data analysis. The outputs of this process will be the Scope Management Plan and Requirements management plan.

The objective of this Project is to develop the Scope Management Plan to ensure that the project includes all the work required to complete the improvement of the virtual learning platform for hybrid learning in the Bahamian School system successfully.

The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System

SCOPE MANAGEMENT PLAN

Nassau
The Bahamas

16 January 2023

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4.2.3 Roles and Responsibilities

4.2.4 Scope Definition

4.2.5 Project Scope Statement

4.2.6 Work Breakdown Structure

4.2.7 Scope Verification

4.2.8 Scope Control

4.2.9 Requirements Management Approach

4.2.10 Configuration Management

4.2.11 Requirements Prioritization Process

4.2.12 Product Metrics

4.2.13 Requirements Traceability Matrix

4.2.14 Sponsor Acceptance

4.2.1 Introduction

The Scope Management Plan provides the scope framework for this project. This plan documents the scope management approach; roles and responsibilities as they pertain to project scope; scope definition; verification and control measures; scope change control; and the project's work breakdown structure. Any project communication which pertains to the project's scope should adhere to the Scope Management Plan. The Scope Management Plan describes how the project scope will be defined, developed, monitored, controlled, and validated. The main components of the plan for this project include:

- A project scope statement and scope management approach

- The Work Breakdown Structure (WBS)
- The scope baseline that will be approved and maintained.
- Verification and control measures
- Scope change control
- Formal acceptance of the completed project deliverables

4.2.2 Scope Management Approach

For this project, scope management will be the sole responsibility of the Project Manager. The scope for this project is defined by the Scope Statement, Work Breakdown Structure (WBS) and WBS Dictionary. The Project Manager, Sponsor and Stakeholders will establish and approve documentation for measuring project scope which includes deliverable quality checklists and work performance measurements. Proposed scope changes may be initiated by the Project Manager, Stakeholders or any member of the project team. All change requests will be submitted to the Project Manager who will then evaluate the requested scope change. Upon acceptance of the scope change request the Project Manager will submit the scope change request to the Change Control Board and Project Sponsor for acceptance. Upon approval of scope changes by the Change Control Board and Project Sponsor the Project Manager will update all project documents and communicate the scope change to all stakeholders. Based on feedback and input from the Project Manager and Stakeholders, the Project Sponsor is responsible for the acceptance of the final project deliverables and project scope.

4.2.3 Roles and Responsibilities

The project manager is responsible for ensuring that requirements-related work is accounted for in the project management plan and that requirements-related activities are

performed on time and within budget and delivery value. If a business analyst is assigned to a project, requirement-related activities are the responsibility of that role. The relationship between a project manager and a business analyst should be a collaborative partnership. A project will have a higher likelihood of being successful if project managers and business analysts fully understand each other's roles and responsibilities to successfully achieve project objectives (PMBOK, 2017, p.132).

Table 3: Scope Management Roles and Responsibilities

Role	Responsibility
Sponsor	Approve or deny scope change requests as appropriate. Evaluate need for scope change requests. Accept project deliverables.
Project Manager	Measure and verify project scope. Facilitate scope change requests. Facilitate impact assessments of scope change requests. Organize and facilitate scheduled change control meetings. Communicate outcomes of scope change requests. Update project documents upon approval of all scope changes.
Team Lead	Measure and verify project scope. Validate scope change requests. Participate in impact assessments of scope change requests. Communicate outcomes of scope change

	requests to team. Facilitate team level change review process.
Team Member	Participate in defining change resolutions. Evaluate the need for scope changes and communicate them to the project manager as necessary.
Stakeholders	Offer changes in the scope that are better suited for the system's use.
Website Developer	Responsible for managing and maintaining the webpage and the content.
Ministry of Education	Responsible for defining the instructional guides.

(Source: Author of Study)

4.2.4 Scope Definition

This is the process of developing a detailed description of the project and product (PMBOK, 2017, p.129). The scope for the Improvement of the Virtual Learning Platform for hybrid learning in the Bahamian School system was defined through a comprehensive requirements collection process. A thorough analysis was performed on the Ministry of Education current virtual learning platform to determine what upgrades needed to be developed. This will be carried out through a project requirements documentation, the requirements management plan, and the requirements traceability matrix.

The project description and deliverables will be developed based on the requirements collection process and input from educators, tutors, technical support, programming and instructional design. The process of expert judgment provides feedback on the most effective ways to meet the requirements of providing the improvement to the virtual learning system.

4.2.5 Project Scope Statement

The project scope statement details the project's deliverables and the work necessary to create these deliverables. This project involves the testing and implementation of the improvement in the virtual learning platform. The deliverables for this project are a Project Management Plan for the Improvement of the learning Management System (LMS) Virtual learning platform in The Bahamian School System to implement hybrid learning. This project will be accepted once the new platform has been successfully tested in the school system for each subject and has been shown to be compatible with the education system of The Bahamas will not only maintaining but improving students' performance and access to resources. Private schools will not be part of the analysis. The LMS is the only virtual platform concerned by the project and the project will be executed on improving only elements of this platform. The project must be executed in 3 months. All upgrades to be added must comply with international education standards. Assumptions for this project are that information about the learning management system (LMS) in The Bahamas is organized and available. All government entities are ready to collaborate in signing all documents and contracts. All the local stakeholders are ready to be involved in the project. Researcher time for the FGP will be at least 10 hours per week during the FGP development process.

Project Description and How it Meets the Business Need

The project will improve the Learning Management System (LMS) in the Bahamian Education System. The project will see to it that the virtual learning platform will be able to maintain the heavy traffic as more people are better able to access the platform, with the latest technology available. This project initiative is aligned with achieving SDG 4: Quality Education - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Project Benefits

The aim of this project is to establish a project management plan that will improve the Learning Management System (LMS) in the Bahamian Education System will benefit the Bahamian Government, the students, teachers and school faculty and staff in the education system, the local communities, business places. Project benefits include:

1. Contribution to the achievement of SDG 4: Quality Education.
2. Flexible learning as classes can be taken synchronously or asynchronously in comfort at any location with a Wi-Fi enabled device.
3. Students will learn using a medium best suited for their style of learning.

Project Requirements

1. Dedicated funds for the creation of a new project team.
2. Tax incentives: duty and tax waiver on materials needed to complete the project.
3. Competent and dedicated Project Manager and Project Team.

4. Availability of adequate technical expertise and equipment.
5. Secured funding.

Project Deliverables

1. A project charter to define the key input elements to develop the project management plan.
2. A Scope Management Plan to ensure that the project includes all the work required to complete the project successfully.
3. A Cost Management Plan to keep the cost range inside the project cost constraint.
4. A Quality Management Plan to ensure all activities and tasks are done to maintain the desired level of excellence in relation to previously defined objectives.
5. A Resource Management Plan to ensure the resources necessary to complete the project successfully are utilized appropriately.
6. A Communications Management Plan to ensure open communication with all stakeholders.
7. A Risk Management Plan to plan, identify, analyze, respond and monitor risks on the project.
8. A Procurement Management Plan to detail all the requirements necessary to acquire the necessary goods, works and services to complete the project successfully.
9. A Stakeholder Management Plan to ensure all stakeholders are considered.
10. A Schedule Management Plan to manage the timely completion of the project.
11. A Sustainability plan to develop and ensure sustainable objectives.

Project Exclusions

1. Private schools will not be part of the analysis.

2. The LMS is the only virtual platform concerned by the project and the project will be executed on improving only elements of this platform.

Success/Acceptance Criteria

1. The project must be executed in 3 months.
2. All upgrades to be added must comply with international education standards.
3. Project must be completed within a budget of $10,000.
4. All project deliverables must be met based on requirements in the Requirements Traceability Matrix.

Project Constraints

1. Private schools will not be part of the analysis.

2. The LMS is the only virtual platform concerned by the project and the project will be executed on improving only elements of this platform.

3. The project must be executed in 3 months.

4. All upgrades to be added must comply with international education standards.

Project Assumptions

1. Information about the learning management system (LMS) in The Bahamas is organized and available.
2. All government entities are ready to collaborate for signing all documents and contracts.

3. All the local stakeholders are ready to be involved in the project.
4. Researcher time for the FGP will be at least 10 hours per week during the FGP development process.

4.2.6 Work Breakdown Structure

For the Project Manager to effectively manage the project's scope for the project team to work on, the project will be subdivided into individual work packages necessary for its successful completion.

Table 4: Learning Management System WBS

Deliverable ID Number	Deliverable Name
1.0	Systems Engineering
	Project Initiation
1.1.	Collect Sponsor Requirements
1.1.1	Meet with Sponsor
1.1.2	Establish Project Requirements/Scope
	Project Defined
1.2	Market Research
1.2.1	Conduct Market Survey
1.2.2	Collect Information
1.2.3	Analyze Information
1.2.4	Present Findings
	Market Analysis Report

1.3	Conduct Product Research
1.3.1	Determine Software Requirements Specifications
1.3.2	Determine Hardware Requirements Specifications
1.3.3	Determine Security Requirements Specifications
	Hardware/Software/Security Requirements Established
1.4	Determine Business Definition Requirements
1.4.1	Identify Key Stakeholders
1.4.2	Conduct interviews/focus group sessions to capture Stakeholder requirements
1.4.3	Categorize Requirements
1.4.4	Interpret and Record Requirements
	Business Requirements Report
	Product Defined
2.0	System Design
2.1.1	Establish Software Requirements
2.1.2	Establish Hardware Requirements
2.1.3	Establish Security Requirements
	System design Completed
2.2	User Interface Design
2.2.1	Develop Information Architecture
2.2.2	Design Graphical user interface

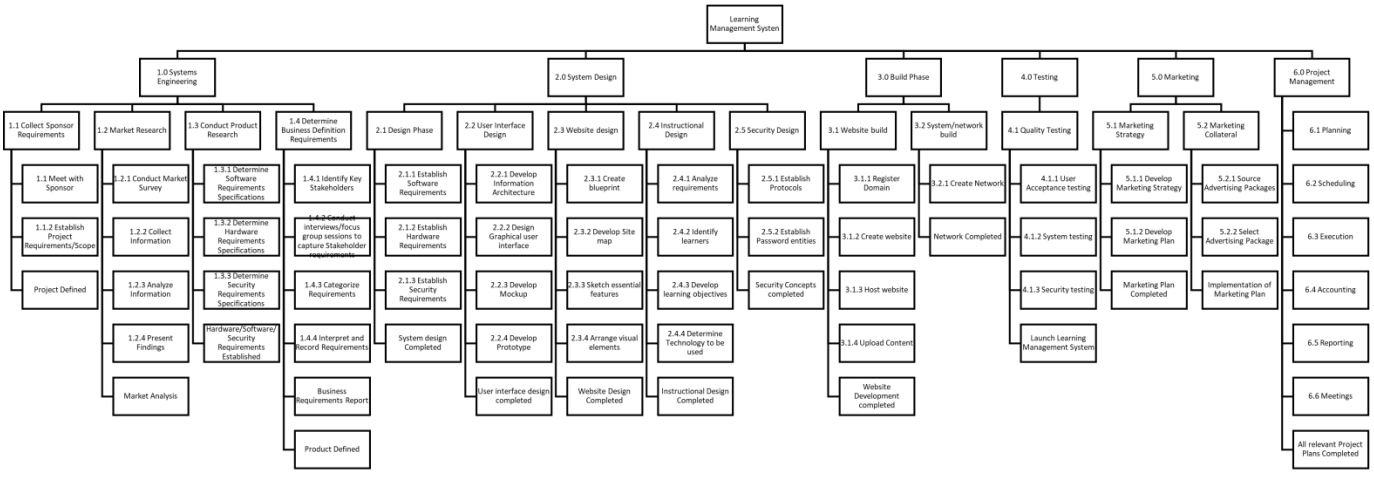
2.2.3	Develop Mockup
2.2.4	Develop Prototype
	User interface design completed
2.3	Website design
2.3.1	Create blueprint
2.3.2	Develop Site map
2.3.3	Sketch essential features
2.3.4	Arrange visual elements
	Website Design Completed
2.4	Instructional Design
2.4.1	Analyze requirements
2.4.2	Identify learners
2.4.3	Develop learning objectives
2.4.4	Determine Technology to be used
	Instructional Design Completed
2.5	Security Design
2.5.1	Establish Protocols
2.5.2	Establish Password entities
	Security Concepts completed
3.0	Build Phase
3.1	Website build

3.1.1	Register Domain
3.1.2	Create website
3.1.3	Host website
3.1.4	Upload Content
	Website Development completed
3.2	System/network build
3.2.1	Create Network
	Network Completed
4.0	Testing
4.1	Quality Testing
4.1.1	User Acceptance testing
4.1.2	System testing
4.1.3	Security testing
	Launch Learning Management System
5.0	Marketing
5.1	Marketing Strategy
5.1.1	Develop Marketing Strategy
5.1.2	Develop Marketing Plan
	Marketing Plan Completed
5.2	Marketing Collateral
5.2.1	Source Advertising Packages

5.2.2	Select Advertising Package
6.0	Implementation of Marketing Plan
6.1	Project Management
6.1.1	Planning
6.1.2	Scheduling
6.1.3	Execution
6.1.4	Accounting
6.1.5	Reporting
6.1.6	Meetings
	All relevant Project Plans Completed

(Source: Author of Study)

Figure 5. LMS WBS



(Source: Author of Study)

Table 5 LMS WBS Dictionary

WBS Code	Activity Name	Description of Work	Deliverables	Budget	Resources
1.0	Systems Engineering	This preliminary analysis entails the collection of information necessary for making the project decisions.		$10,000	
	Project Initiation				
1.1.	Collect Sponsor Requirements	Meeting to determine project needs	Initial requirement documentation		Laptop Internet Relevant literature
1.1.1	Meet with Sponsor	Meeting with Sponsor to understand the project requirements	Sponsor Directive		Laptop Internet Relevant literature
1.1.2	Establish Project Requirements/Scope	Description and scope of work established	Scope definition		Laptop Internet Relevant literature
	Project Defined	Project Scope established			
1.2	Market Research				
1.2.1	Conduct Market Survey	Conducting surveys to obtain pertinent information	Survey instruments		Survey software Laptop Internet
1.2.2	Collect Information	Collect findings	Survey findings		Laptop Internet
1.2.3	Analyze Information	Analyze findings	Survey evaluation		Survey software Laptop Internet
1.2.4	Present Findings	Present findings	Survey report		Laptop Internet Presentation

					apparatus
	Market Analysis				
1.3	Conduct Product Research	Research will identify the required components for the system			
1.3.1	Determine Software Requirements Specifications	Develop the software requirements adequate for the LMS	Software requirements		Laptop Internet Brochures
1.3.2	Determine Hardware Requirements Specifications	Develop the hardware requirements adequate for the LMS	Hardware requirements		Laptop Internet Brochures
1.3.3	Determine Security Requirements Specifications	Develop the best layout for the security measures of the system for logins	Security requirements		Laptop Internet Brochures
	Hardware/Software/Security Requirements Established				
1.4	Determine Business Definition Requirements	This process will determine the business case and its feasibility			
1.4.1	Identify Key Stakeholders	Determine key stakeholders	Stakeholder list		Laptop Internet Spreadsheet software
1.4.2	Conduct interviews/focus group sessions to capture Stakeholder requirements	Collect Stakeholder Requirements	Stakeholder requirements		Laptop Internet Spreadsheet software
1.4.3	Categorize Requirements	Classify Requirements of Stakeholder	Classification document		Laptop Internet Spreadsheet software
1.4.4	Interpret and Record	Analyze	Stakeholder		Laptop

	Requirements	requirements	register		Internet Spreadsheet software
	Business Requirements Report				
	Product Defined				
2.0	System Design			$10,000	
2.1.1	Establish Software Requirements	Specifying the software elements of the LMS	List of software components		Laptop Internet Spreadsheet software
2.1.2	Establish Hardware Requirements	Specifying the hardware elements of the LMS	List of hardware components		Laptop Internet Spreadsheet software
2.1.3	Establish Security Requirements	Specifying the security elements of the LMS	List of security components		Laptop Internet Spreadsheet software
	System design Completed				
2.2	User Interface Design	Develop a user-friendly interface that is Human-Computer Interaction prescribed.			
2.2.1	Develop Information Architecture	Create the platform for the content	Architecture documentation		Laptop Internet
2.2.2	Design Graphical user interface	Designing user interface	Graphical interface concept		Laptop Internet Smart draw software
2.2.3	Develop Mockup	Create Mockup	Mockup Concept		Laptop Internet Smart draw software
2.2.4	Develop Prototype	Creating prototype of user interface for testing	Prototype established		Laptop Internet Smart draw software
	User interface design completed				
2.3	Website design	Designing elements for	Website concepts and		

		website	elements		
2.3.1	Create blueprint	Conceptualizing website layout	Website layout		Laptop Internet Website design software
2.3.2	Develop Site map	Website sitemap detailing	Website sitemap		Laptop Internet Website design software
2.3.3	Sketch essential features	Conceptualizing website components	Collection of sketches		Laptop Internet Website design software
2.3.4	Arrange visual elements	Arrangement of elements to create proper fit	Website design		Laptop Internet Website design software
	Website Design Completed				
2.4	Instructional Design	Collect the curriculum for the various BJC and BGSCE subjects			Laptop Internet
2.4.1	Analyze requirements				
2.4.2	Identify learners				
2.4.3	Develop learning objectives	Record the learning objectives for the various subjects	Subject/course learning objectives		
2.4.4	Determine Technology to be used	Decision on the appropriate platform	Platform		
	Instructional Design Completed				
2.5	Security Design	Designing the aspects of security	Security concepts		Laptop Internet Security software/hardware
2.5.1	Establish Protocols	Determine security protocols	Security concepts		Laptop Internet Protocols
2.5.2	Establish Password entities	Creating Password	Password security		Laptop Internet

		security	protocol		Security software
	Security Concepts completed				
3.0	Build Phase	Construction of the physical components of the LMS		$50,000	
3.1	Website build	Construction of the website in accordance with the design plan	Website for LMS		
3.1.1	Register Domain	Register website domain with hosting organization	Domain of website		Laptop Internet Domain Registration
3.1.2	Create website	Build a robust website	Website		Laptop Internet Website development software
3.1.3	Host website	Hosting website	Website on servers		Laptop Internet Webserver
3.1.4	Upload Content	Upload content onto website	Content upload		Laptop Internet Website
	Website Development completed				
3.2	System/network build				
3.2.1	Create Network				
	Network Completed				
4.0	Testing	Testing of system components	Test results	$10,000	Laptop Internet Website LMS
4.1	Quality Testing	Carry out quality test to ensure system is working as designed	Quality assurance report		Laptop Internet Website LMS
4.1.1	User Acceptance testing	Allow random	User		Laptop

		users to interact with the LMS	acceptance data		Internet Website LMS
4.1.2	System testing	Perform a beta system run to determine functionality	System test report		Laptop Internet Website LMS
4.1.3	Security testing	Ensure the protection mechanisms are operational	Security testing report		Laptop Internet Website LMS
	Launch Learning Management System				
5.0	Marketing	Provide and execute strategies to sell the product	Marketing strategies	$10,000	Laptop Internet
5.1	Marketing Strategy	Brainstorming the best possible selling outcomes	List of marketing options		Laptop Internet
5.1.1	Develop Marketing Strategy	Draft marketing strategies	Marketing strategies		Laptop Internet
5.1.2	Develop Marketing Plan	Layout plan	Marketing framework		Laptop Internet
	Marketing Plan Completed				
5.2	Marketing Collateral	Undertake tasks to sell the LMS to potential users	Marketing and advertising Plan		
5.2.1	Source Advertising Packages	Acquire advertising packages	Advertising options		Brochures
5.2.2	Select Advertising Package	Selection of suitable and affordable advertising package	Suitable advertising package		Brochures
6.0	Implementation of Marketing Plan			$200,000	

6.1	Project Management	The management of the planning, execution, monitoring and controlling and closure activities of the project			
6.1.1	Planning	The development of the various Project Plans and the updating of those plans throughout the project lifecycle			
6.1.2	Scheduling	The assignment of timeframes and dates to project activities to establish the schedule and to control the duration of the project			
6.1.3	Execution	The monitoring and control of the implementation of project activities			
6.1.4	Accounting	The monitoring of the finances and expenditure of			

		the Project			
6.1.5	Reporting	The preparation of project reports and the documenting of project activities			
6.1.6	Meetings	Meeting held during the Project to monitor and control activities and for the management of the Project Office			
	All relevant Project Plans Completed				

(Source: Author of Study)

4.2.7 Scope Verification

As the LMS project progresses, the project manager will verify the 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. This will ensure that the project work remains within the scope of the project on a consistent basis throughout the life of the project.

Table 6: Scope Verification

Project:	The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System

WBS Level	WBS ID	WBS Element Name	Planned Deliverable	Deliverable Submitted	Variance	Comments

(Source: Author of Study)

4.2.8 Scope Control

The Project Manager and the project team will work together to control the scope of the 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 only perform 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.

If a change to the project scope is needed, the process for recommending changes to the scope of the project must be carried out. Any project team member or sponsor can request changes to the project scope. All change requests must be submitted to the Project Manager in the form of a project change request document. The Project Manager will then review the suggested change to the scope of the project. The Project Manager will then either deny the change request if it does not apply to the intent of the project or convene a change control meeting between the project team and Sponsor to review the change request further and perform an impact assessment of the change. If the change request receives initial approval by the Project Manager and Sponsor, the

Project Manager will then formally submit the change request to the Change Control Board. If the Change Control Board approves the scope change the Project Sponsor will then formally accept the change by signing the project change control document. Upon acceptance of the scope change by the Change Control Board and Project Sponsor the Project Manager will update all project documents and communicate the scope change to all project team members and stakeholders.

4.2.9 Requirements Management Approach

The approach for requirements management for the project will be broken down into four areas: requirements identification, requirements analysis, requirements documentation, and ongoing requirements management.

Requirements Identification: To collect requirements, various methods are used which include interviews, questionnaires and surveys and observations. These will be conducted among the project stakeholders to ensure all requirements are met.

Requirements Analysis: Requirements will be analyzed to determine if they fit into project or product categories. Additionally, this analysis will determine where in the WBS the requirements fit or what work activities correspond to requirements. Accountability and priority for each requirement will also be determined as part of the analysis. Finally, metrics and the acceptance criteria must be determined for all requirements in order to provide a baseline for understanding when a requirement has been fulfilled to an acceptance level.

Requirements Documentation: Once requirements have been identified and analyzed, they will be documented and assigned to accountable personnel. These requirements will be added

to the project plan and the project team will determine what methodology the accountable personnel will use to track and report on the status of each requirement. All requirements will also be added to the project requirements checklist which must be completed before formal project closure is accepted by the project sponsor.

Ongoing Requirements Management: Throughout the project lifecycle, the project manager will ensure all team members are reporting requirements status and raising any issues or concerns with their assigned requirements as appropriate. As the project matures, there may be situations that may arise in which requirements necessitate modification. The project team must follow the established change control process to propose any adjustments to requirements and receive approval from the Project Sponsor. Ongoing requirements management also includes receiving approval of all requirements by all vested parties as part of project closure.

4.2.10 Configuration Management

Every identified project requirement is set forth in a designated register. This is called the Requirements Register. Only the approved requirements will be carried forward for project work. The approved requirements are listed in the Requirements Traceability Matrix.

Change Control: All proposed changes in project requirements must be carefully considered before approval and implementation. All changes will in some way impact the project scope, time, and/or cost, some more significantly than others. All proposed changes to project requirements will be reviewed by the Project Sponsor. The role of the Project Sponsor is to determine the impact of the proposed change on the project, seek clarification on the proposed change, and ensure that approved changes are added to the Requirements

Traceability Matrix. The Project Sponsor is responsible for approving all changes in project scope, time, or cost and plays an integral role in the change review and approval process.

4.2.11 Requirements Prioritization Process

Table 7 Requirements Prioritization Process

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

(Source: Author of Study)

As the project moves forward and constraints identified, it may be necessary for the project team and stakeholders to meet to determine what requirements must be achieved, which can be re-baselined, or which can be omitted. These determinations will be made in a collaborative effort based on the priorities of the requirements and which level they are assigned in accordance with the chart above. As changes in requirements are made, all project documentation must be updated in the Requirements Traceability Matrix and communicated to all project stakeholders.

4.2.12 Product Metrics

Product metrics for the project will be based on cost, quality, and performance requirements. To achieve project success, the deliverables must meet or exceed all established metrics.

Table 8 Budget

Component	Cost (USD) $
System Engineering	1500
Designing	1000
Human Resource	2700
Testing	1000
Hardware/Software	2500
Marketing	500
Sub-Total	9,200
Contingency Reserve (5% of total)	500
Management Reserve (3% of total)	300
Total	10,000

(Source: Author of Study)

Quality

- Run the website offline to verify the links are functional and all the activities and exercises are uploaded.
- Design must fit user requirements.
- The network must be able to accommodate multiple (1000s) user logins at once.

4.2.13 Requirements Traceability Matrix

The purpose of the requirements traceability matrix is to ascertain that all product requirements are completed in accordance with the project charter. This matrix provides a thread from all product requirements through planning testing, and user acceptance. All approved changes in project scope or requirements will be modified in the traceability matrix. Based on impacts of the approved changes, the Project Manager is responsible for documenting the necessary changes to the matrix and communicating it to all project stakeholders.

Table 9 Requirements Traceability Matrix

Project Name:	The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System						
Project Description:	The project will improve the Learning Management System (LMS) in the Bahamian Education System. The project will see to it that the virtual learning platform will be able to maintain the heavy traffic as more people are better able to access the platform, with the latest technology available. This project initiative is aligned with achieving SDG 4: Quality Education - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.						
WBS Code	Requirement Name	Description of Work	Deliverables	Verification	Product Design/Development Requirement	Priority	Status
1.0	Systems Engineering	This preliminary analysis entails the collection of information necessary for making the project decisions.				High	
	Project Initiation					High	
1.1.	Collect Sponsor Requirements	Meeting to determine	Initial requirem	Project Manager	Laptop Internet	High	

		project needs	ent document ation		Relevant literature		
1.1.1	Meet with Sponsor	Meeting with Sponsor to understand the project requirements	Sponsor Directive	Project Manager	Laptop Internet Relevant literature	High	
1.1.2	Establish Project Requirements/Scope	Description and scope of work established	Scope definition	Project Manager	Laptop Internet Relevant literature	High	
	Project Defined	Project Scope established				High	
1.2	Market Research			Project Team		High	
1.2.1	Conduct Market Survey	Conducting surveys to obtain pertinent information	Survey instruments	Project Team	Survey software Laptop Internet	High	
1.2.2	Collect Information	Collect findings	Survey findings	Project Team	Laptop Internet	High	
1.2.3	Analyze Information	Analyze findings	Survey evaluation	Project Team	Survey software Laptop Internet	High	
1.2.4	Present Findings	Present findings	Survey report	Project Team	Laptop Internet Presentation apparatus	High	
	Market Analysis					High	
1.3	Conduct Product Research	Research will identify the required		Project Team		High	

		components for the system					
1.3.1	Determine Software Requirements Specifications	Develop the software requirements adequate for the LMS	Software requirements	Project Team	Laptop Internet Brochures	High	
1.3.2	Determine Hardware Requirements Specifications	Develop the hardware requirements adequate for the LMS	Hardware requirements	Project Team	Laptop Internet Brochures	High	
1.3.3	Determine Security Requirements Specifications	Develop the best layout for the security measures of the system for logins	Security requirements	Project Team	Laptop Internet Brochures	High	
	Hardware/Software/Security Requirements Established					High	
1.4	Determine Business Definition Requirements	This process will determine the business case and its feasibility		Project Team		High	
1.4.1	Identify Key Stakeholders	Determine key stakeholde	Stakeholder list	Project Team	Laptop Internet Spreadsheet	High	

		rs			software		
1.4.2	Conduct interviews/focus group sessions to capture Stakeholder requirements	Collect Stakeholder Requirements	Stakeholder requirements	Project Team	Laptop Internet Spreadsheet software	High	
1.4.3	Categorize Requirements	Classify Requirements of Stakeholder	Classification document	Project Team	Laptop Internet Spreadsheet software	High	
1.4.4	Interpret and Record Requirements	Analyze requirements	Stakeholder register	Project Team	Laptop Internet Spreadsheet software	High	
	Business Requirements Report					High	
	Product Defined					High	
2.0	System Design			Project Team		High	
2.1.1	Establish Software Requirements	Specifying the software elements of the LMS	List of software components	Project Team	Laptop Internet Spreadsheet software	High	
2.1.2	Establish Hardware Requirements	Specifying the hardware elements of the LMS	List of hardware components	Project Team	Laptop Internet Spreadsheet software	High	
2.1.3	Establish Security Requirements	Specifying the security elements of the LMS	List of security components	Project Team	Laptop Internet Spreadsheet software	High	
	System design Completed					High	
2.2	User Interface Design	Develop a user-		Web Administ		High	

		friendly interface that is Human-Computer Interaction prescribed.		rator			
2.2.1	Develop Information Architecture	Create the platform for the content	Architecture documentation	Web Administrator	Laptop Internet	High	
2.2.2	Design Graphical user interface	Designing user interface	Graphical interface concept	Web Administrator	Laptop Internet Smart draw software	High	
2.2.3	Develop Mockup	Create Mockup	Mockup Concept	Web Administrator	Laptop Internet Smart draw software	High	
2.2.4	Develop Prototype	Creating prototype of user interface for testing	Prototype established	Web Administrator	Laptop Internet Smart draw software	High	
	User interface design completed					High	
2.3	Website design	Designing elements for website	Website concepts and elements	Web Administrator		High	
2.3.1	Create blueprint	Conceptualizing website layout	Website layout	Web Administrator	Laptop Internet Website design software	High	
2.3.2	Develop Site map	Website sitemap detailing	Website sitemap	Web Administrator	Laptop Internet Website design software	High	
2.3.3	Sketch essential features	Conceptualizing website componen	Collection of sketches	Web Administrator	Laptop Internet Website design	High	

		ts			software		
2.3.4	Arrange visual elements	Arrangement of elements to create proper fit	Website design	Web Administrator	Laptop Internet Website design software	High	
	Website Design Completed					High	
2.4	Instructional Design	Collect the curriculum for the various BJC and BGSCE subjects		Teachers and Ministry of Education	Laptop Internet	High	
2.4.1	Analyze requirements			Teachers and Ministry of Education		High	
2.4.2	Identify learners			Teachers and Ministry of Education		High	
2.4.3	Develop learning objectives	Record the learning objectives for the various subjects	Subject/course learning objectives	Teachers and Ministry of Education		High	
2.4.4	Determine Technology to be used	Decision on the appropriate platform	Platform	Teachers and Ministry of Education		High	
	Instructional Design Completed					High	
2.5	Security Design	Designing the aspects of security	Security concepts	Project Team	Laptop Internet Security	High	

					software/hard ware		
2.5.1	Establish Protocols	Determine security protocols	Security concepts	Project Team	Laptop Internet Protocols	High	
2.5.2	Establish Password entities	Creating Password security	Password security protocol	Project Team	Laptop Internet Security software	High	
	Security Concepts completed					High	
3.0	Build Phase	Construction of the physical components of the LMS				High	
3.1	Website build	Construction of the website in accordance with the design plan	Website for LMS	Web administrator		High	
3.1.1	Register Domain	Register website domain with hosting organization	Domain of website	Web administrator	Laptop Internet Domain Registration	High	
3.1.2	Create website	Build a robust website	Website	Web administrator	Laptop Internet Website development software	High	
3.1.3	Host website	Hosting website	Website on servers	Web administrator	Laptop Internet Webserver	High	
3.1.4	Upload Content	Upload content onto website	Content upload	Web administrator	Laptop Internet Website	High	
	Website					High	

	Development completed						
3.2	System/network build			Systems administrator		High	
3.2.1	Create Network			Systems administrator		High	
	Network Completed					High	
4.0	Testing	Testing of system components	Test results		Laptop Internet Website LMS	High	
4.1	Quality Testing	Carry out quality test to ensure system is working as designed	Quality assurance report	Systems administrator	Laptop Internet Website LMS	High	
4.1.1	User Acceptance testing	Allow random users to interact with the LMS	User acceptance data	Systems administrator	Laptop Internet Website LMS	High	
4.1.2	System testing	Perform a beta system run to determine functionality	System test report	Systems administrator	Laptop Internet Website LMS	High	
4.1.3	Security testing	Ensure the protection mechanisms are operational	Security testing report	Systems administrator	Laptop Internet Website LMS	High	
	Launch Learning Management System					High	
5.0	Marketing	Provide and	Marketing		Laptop Internet	High	

		execute strategies to sell the product	strategies				
5.1	Marketing Strategy	Brainstorming the best possible selling outcomes	List of marketing options	Project Team	Laptop Internet	High	
5.1.1	Develop Marketing Strategy	Draft marketing strategies	Marketing strategies	Project Team	Laptop Internet	High	
5.1.2	Develop Marketing Plan	Layout plan	Marketing framework	Project Team	Laptop Internet	High	
	Marketing Plan Completed					High	
5.2	Marketing Collateral	Undertake tasks to sell the LMS to potential users	Marketing and advertising Plan	Project Team		High	
5.2.1	Source Advertising Packages	Acquire advertising packages	Advertising options		Brochures	High	
5.2.2	Select Advertising Package	Selection of suitable and affordable advertising package	Suitable advertising package	Project Team	Brochures	High	
6.0	Implementation of Marketing Plan					High	
6.1	Project Management	The management of the planning, execution, monitoring and controlling				High	

		and closure activities of the project					
6.1.1	Planning	The development of the various Project Plans and the updating of those plans throughout the project lifecycle		Project Manager		High	
6.1.2	Scheduling	The assignment of timeframes and dates to project activities to establish the schedule and to control the duration of the project		Project Manager		High	
6.1.3	Execution	The monitoring and control of the implementation of project activities		Project Manager		High	
6.1.4	Accounting	The monitorin		Project Manager		High	

		g of the finances and expenditure of the Project					
6.1.5	Reporting	The preparation of project reports and the documenting of project activities		Project Manager		High	
6.1.6	Meetings	Meeting held during the Project to monitor and control activities and for the management of the Project Office		Project Manager		High	
	All relevant Project Plans Completed						

(Source: Author of Study)

4.2.14 Sponsor Acceptance

Approved by the Project Sponsor:

_____ Date: _____

<Project Sponsor>

<Project Sponsor Title>

4.3. Schedule Management Plan

According to the PMBOK (2017), Project Schedule Management includes the processes required to manage the timely completion of the project. Plan Schedule Management is the process of establishing the policies, procedures, and documentation for planning, development, managing, executing, and controlling the project schedule (p.173). For this project, "The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System," the key benefit of this process is that it provides guidance and direction on how the project schedule will be managed throughout the project. The Schedule Management Plan key input process is the Project Charter and Scope Management Plan. The tools and techniques for developing this plan are expert judgement, data analysis and meetings.

4.3. Schedule Management Plan

According to the PMBOK (2017), Project Schedule Management includes the processes required to manage the timely completion of the project. Plan Schedule Management is the process of establishing the policies, procedures, and documentation for planning, development, managing, executing, and controlling the project schedule (p.173). For this project, "The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System," the key benefit of this process is that it provides guidance and

direction on how the project schedule will be managed throughout the project. The Schedule Management Plan key input process is the Project Charter and Scope Management Plan. The tools and techniques for developing this plan are expert judgement, data analysis and meetings.

The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System

SCHEDULE MANAGEMENT PLAN

Nassau
The Bahamas

13 March 2023

Table of Contents

4.3.1 Introduction

This document describes the Schedule Management Plan for the project, “The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System.” The purpose of the Schedule Management plan is to establish the policies, procedures, and documentation for planning, development, managing, executing, and controlling the project schedule.

4.3.2 Schedule Management Process

This is the process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule. The project manager will use this guide to track changes in schedule throughout the life of the project.

4.3.2.1 Schedule Development

The Project Schedule was created as a Gantt Chart in Microsoft Project 2013 featuring task durations followed by a dependency analysis to determine the order in which the work should occur. The completed project schedule will require approval and then baselined.

Table 10: Project Calendar

PROJECT CALENDAR		
Project Start: 16 January 2023	Work Week: 40 hours	
Project Finish: 30 June 2023	Monday – Friday	
Work Days per month: 20	Date Format: DD/MM/YY	
Hours per day: 9	Work Hours: 8:00am – 12:00pm 1:00pm – 5:00pm	
Lunch Time: 1 hour per day	Non-working days for project duration: 4 days	
Non-Working Times and Holiday		
Description	Day	Date
Good Friday	Friday	7 April 2023
Easter Monday	Monday	10 April 2023
Whit Monday	Monday	29 May 2023
Labor Day	Friday	2 June 2023

(Source: Author of Study)

Chart 8 Activity List and Duration Estimated

ID	Task Name	Duration	Milestone	Start	Finish	Predecessors	Resource Names
1		120 days	No	Mon 1/16/23	Fri 6/30/23		
2	Systems Engineering		Yes				
3	Project Initiation		No				
4	Collect Sponsor Requirements		No				Project Manager
5	Meet with Sponsor	1 day	No	Mon 1/16/23	Mon 1/16/23		Project Manager
6	Establish Project Requirements/Scope	1 day	No	Tue 1/17/23	Tue 1/17/23	5	Project Manager
7	Project Defined	1 day	Yes	Tue 1/17/23	Tue 1/17/23	5,6	
8	Market Research		No				Project Team
9	Conduct Market Survey	1 day	No	Wed 1/18/23	Wed 1/18/23	7	Project Team
10	Collect Information	1 day	No	Thu 1/19/23	Thu 1/19/23	9	Project Team
11	Analyze Information	1 day	No	Fri 1/20/23	Fri 1/20/23	10	Project Team
12	Present Findings	1 day	Yes	Mon 1/23/23	Mon 1/23/23	11	Project Team
13	Market Analysis Report	2 days	Yes	Tue 1/24/23	Wed 1/25/23	12	
14	Conduct Product Research		No				Project Team
15	Determine Software Requirements Specifications	2 days	No	Thu 1/26/23	Fri 1/27/23	13	Project Team
16	Determine Hardware Requirements Specifications	2 days	No	Mon 1/30/23	Tue 1/31/23	13	Project Team
17	Determine Security Requirements Specifications	2 days	No	Wed 2/1/23	Thu 2/2/23	13	Project Team
18	Hardware/Software/Security Requirements Established	2 days	No	Fri 2/3/23	Mon 2/6/23	15,16,17	
19	Determine Business Definition Requirements		No				Project Team
20	Identify Key Stakeholders	2 days	Yes	Tue 2/7/23	Wed 2/8/23	7	Project Team
21	Conduct interviews/focus	1 day	No	Wed	Wed	20	Project Team

	group sessions to capture Stakeholder requirements			2/8/23	2/8/23		
22	Categorize Requirements	1 day	No	Wed 2/8/23	Wed 2/8/23	21	Project Team
23	Interpret and Record Requirements	2 days	No	Thu 2/9/23	Fri 2/10/23	22	Project Team
24	Business Requirements Report	2 days	No	Mon 2/13/23	Tue 2/14/23	23	
25	Product Defined	1 day	No	Wed 2/15/23	Wed 2/15/23	18,20,24	
26	System Design		Yes				Project Team
27	Establish Software Requirements	2 days	No	Thu 2/16/23	Fri 2/17/23	25	Project Team
28	Establish Hardware Requirements	2 days	No	Fri 2/17/23	Mon 2/20/23	25	Project Team
29	Establish Security Requirements	2 days	No	Mon 2/20/23	Tue 2/21/23	25	Project Team
30	System design Completed	1 day	Yes	Wed 2/22/23	Wed 2/22/23		
31	User Interface Design	1 day	No	Thu 2/23/23	Thu 2/23/23		Web Administrator
32	Develop Information Architecture	1 day	No	Fri 2/24/23	Fri 2/24/23	20	Web Administrator
33	Design Graphical user interface	1 day	No	Mon 2/27/23	Mon 2/27/23		Web Administrator
34	Develop Mockup	1 day	No	Tue 2/28/23	Tue 2/28/23		Web Administrator
35	Develop Prototype	1 day	No	Wed 3/1/23	Wed 3/1/23		Web Administrator
36	User interface design completed	1 day	Yes	Thu 3/2/23	Thu 3/2/23		
37	Website design	2 days	No	Fri 3/3/23	Mon 3/6/23		Web Administrator
38	Create blueprint	10 days	No	Mon 3/6/23	Fri 3/17/23	37,28	Web Administrator
39	Develop Site map		No				Web Administrator
40	Sketch essential features		No				Web Administrator
41	Arrange visual elements		No				Web Administrator

42	Website Design Completed		Yes				
43	Instructional Design	7 days	No	Mon 3/20/23	Tue 3/28/23		Teachers and Ministry of Education
44	Analyze requirements	3 days	No	Wed 3/29/23	Fri 3/31/23	24	Teachers and Ministry of Education
45	Identify learners		No				Teachers and Ministry of Education
46	Develop learning objectives		No				Teachers and Ministry of Education
47	Determine Technology to be used		No				Teachers and Ministry of Education
48	Instructional Design Completed		No				
49	Security Design	7 days	Yes	Mon 4/3/23	Tue 4/11/23		Project Team
50	Establish Protocols	2 days	No	Tue 4/11/23	Wed 4/12/23	30	Project Team
51	Establish Password entities		No				Project Team
52	Security Concepts completed	2 days	No	Tue 4/11/23	Wed 4/12/23	53	
53	Build Phase	5 days	No	Thu 4/13/23	Wed 4/19/23		
54	Website build		No				Web Administrator
55	Register Domain	3 days	No	Fri 5/19/23	Tue 5/23/23	43	Web Administrator
56	Create website	5 days	No	Wed 5/24/23	Tue 5/30/23	43	Web Administrator
57	Host website		No				Web Administrator
58	Upload Content	14 days	No	Wed 5/31/23	Mon 6/19/23	49	Web Administrator
59	Website Development completed	1 day	Yes	Mon 6/19/23	Mon 6/19/23	60	
60	System/network build	1 day	No	Mon 6/19/23	Mon 6/19/23		Systems administrator
61	Create Network	1 day	No	Tue	Tue	31	Systems

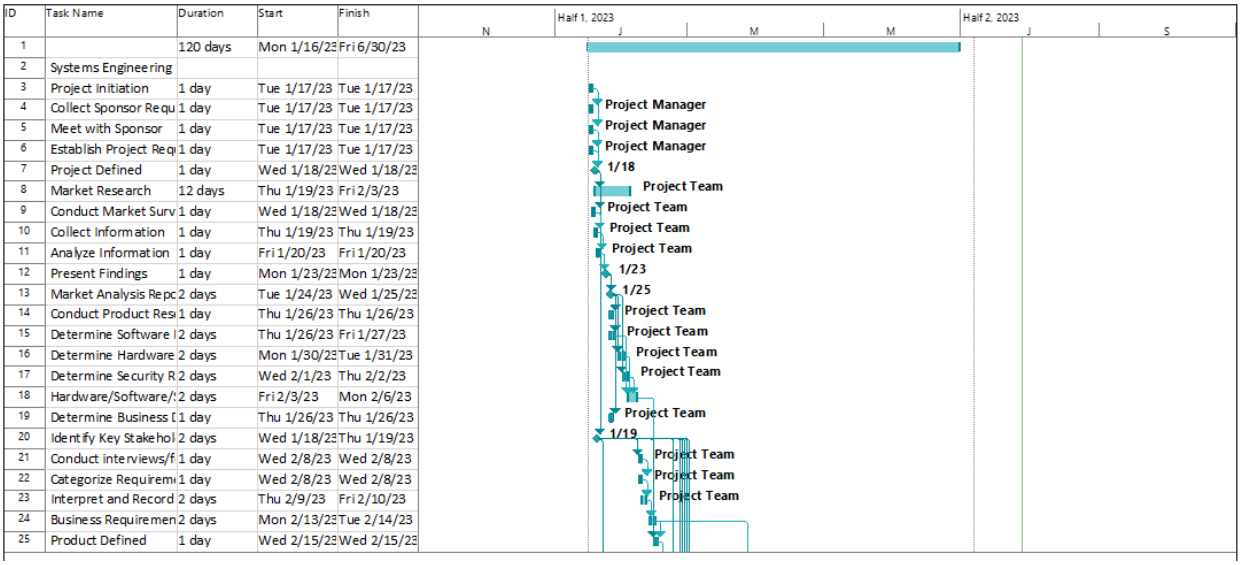
				6/20/23	6/20/23		administrator
62	Network Completed	1 day	Yes	Tue 6/20/23	Tue 6/20/23	63	
63	Testing	1 day	No	Mon 6/19/23	Mon 6/19/23		
64	Quality Testing		No				Systems administrator
65	User Acceptance testing	2 days	No	Fri 6/2/23	Mon 6/5/23	66	Systems administrator
66	System testing	2 days	No	Tue 6/6/23	Wed 6/7/23		Systems administrator
67	Security testing	2 days	No	Thu 6/8/23	Fri 6/9/23	68	Systems administrator
68	Launch Learning Management System	1 day	Yes	Fri 6/9/23	Fri 6/9/23	69	
69	Marketing	12 days	No	Mon 6/12/23	Tue 6/27/23		
70	Marketing Strategy		No				Project Team
71	Develop Marketing Strategy	1 day	No	Mon 6/12/23	Mon 6/12/23	66	Project Team
72	Develop Marketing Plan	4 days	No	Mon 6/12/23	Thu 6/15/23	73	Project Team
73	Marketing Plan Completed	1 day	Yes	Thu 6/15/23	Thu 6/15/23	74	
74	Marketing Collateral	1 day	No	Fri 6/16/23	Fri 6/16/23		Project Team
75	Source Advertising Packages	1 day	No	Mon 6/19/23	Mon 6/19/23	74	
76	Select Advertising Package	1 day	No	Tue 6/20/23	Tue 6/20/23	77	Project Team
77	Implementation of Marketing Plan	3 days	Yes	Tue 6/20/23	Thu 6/22/23		

(Source: Author of Study)

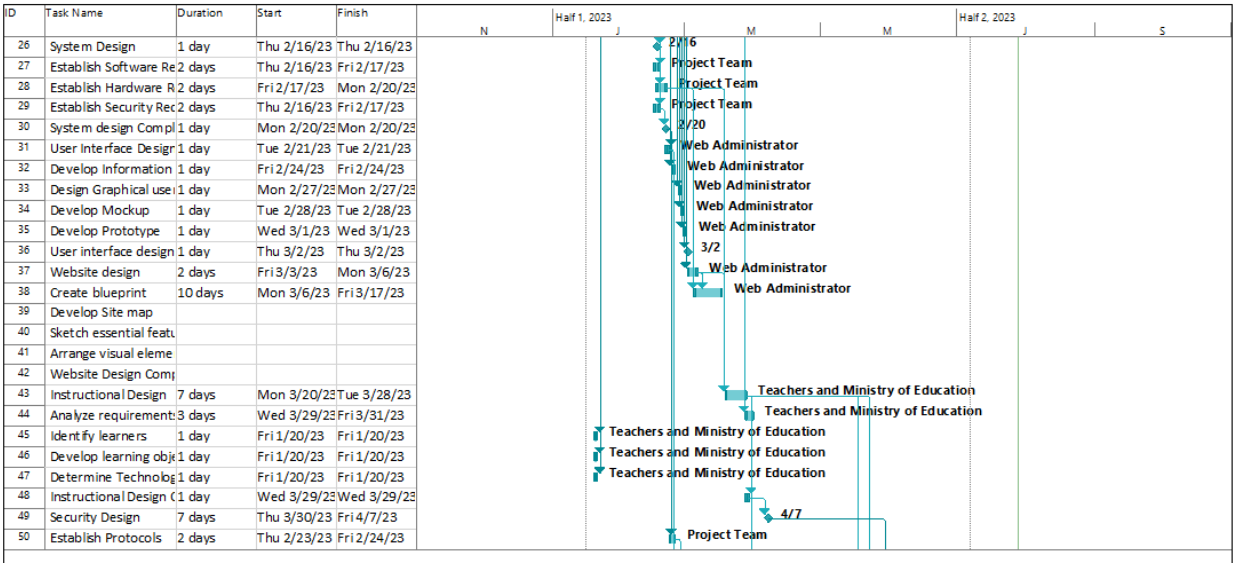
4.3.3 Project Schedule

This is the process of analyzing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model for project execution and monitoring and controlling. The chart below shows the Gantt chart for this process.

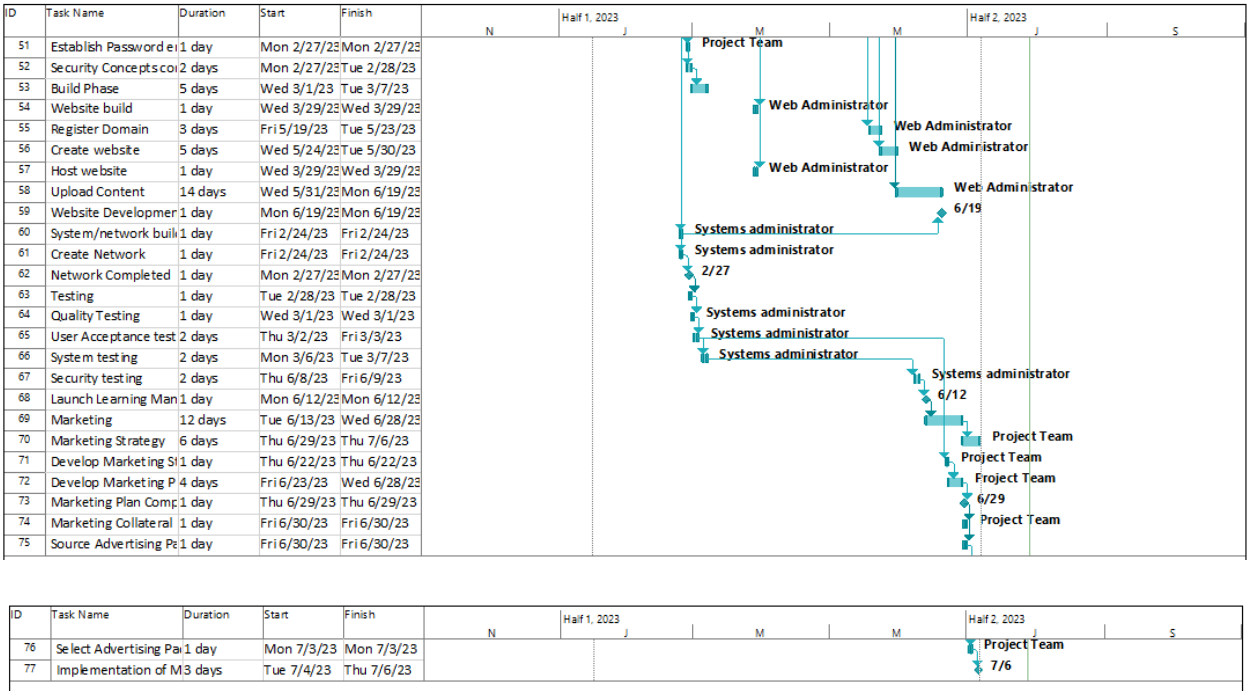
Chart 9 Project Schedule (Gantt Chart)



ID	Task Name	Duration	Start	Finish
1		120 days	Mon 1/16/23	Fri 6/30/23
2	Systems Engineering			
3	Project Initiation	1 day	Tue 1/17/23	Tue 1/17/23
4	Collect Sponsor Requ	1 day	Tue 1/17/23	Tue 1/17/23
5	Meet with Sponsor	1 day	Tue 1/17/23	Tue 1/17/23
6	Establish Project Req	1 day	Tue 1/17/23	Tue 1/17/23
7	Project Defined	1 day	Wed 1/18/23	Wed 1/18/23
8	Market Research	12 days	Thu 1/19/23	Fri 2/3/23
9	Conduct Market Surv	1 day	Wed 1/18/23	Wed 1/18/23
10	Collect Information	1 day	Thu 1/19/23	Thu 1/19/23
11	Analyze Information	1 day	Fri 1/20/23	Fri 1/20/23
12	Present Findings	1 day	Mon 1/23/23	Mon 1/23/23
13	Market Analysis Repo	2 days	Tue 1/24/23	Wed 1/25/23
14	Conduct Product Res	1 day	Thu 1/26/23	Thu 1/26/23
15	Determine Software I	2 days	Thu 1/26/23	Fri 1/27/23
16	Determine Hardware	2 days	Mon 1/30/23	Tue 1/31/23
17	Determine Security R	2 days	Wed 2/1/23	Thu 2/2/23
18	Hardware/Software/S	2 days	Fri 2/3/23	Mon 2/6/23
19	Determine Business D	1 day	Thu 1/26/23	Thu 1/26/23
20	Identify Key Stakehol	2 days	Wed 1/18/23	Thu 1/19/23
21	Conduct interviews/f	1 day	Wed 2/8/23	Wed 2/8/23
22	Categorize Requirem	1 day	Wed 2/8/23	Wed 2/8/23
23	Interpret and Record	2 days	Thu 2/9/23	Fri 2/10/23
24	Business Requiremen	2 days	Mon 2/13/23	Tue 2/14/23
25	Product Defined	1 day	Wed 2/15/23	Wed 2/15/23



ID	Task Name	Duration	Start	Finish
26	System Design	1 day	Thu 2/16/23	Thu 2/16/23
27	Establish Software Re	2 days	Thu 2/16/23	Fri 2/17/23
28	Establish Hardware R	2 days	Fri 2/17/23	Mon 2/20/23
29	Establish Security Rec	2 days	Thu 2/16/23	Fri 2/17/23
30	System design Compl	1 day	Mon 2/20/23	Mon 2/20/23
31	User Interface Design	1 day	Tue 2/21/23	Tue 2/21/23
32	Develop Information	1 day	Fri 2/24/23	Fri 2/24/23
33	Design Graphical use	1 day	Mon 2/27/23	Mon 2/27/23
34	Develop Mockup	1 day	Tue 2/28/23	Tue 2/28/23
35	Develop Prototype	1 day	Wed 3/1/23	Wed 3/1/23
36	User interface design	1 day	Thu 3/2/23	Thu 3/2/23
37	Website design	2 days	Fri 3/3/23	Mon 3/6/23
38	Create blueprint	10 days	Mon 3/6/23	Fri 3/17/23
39	Develop Site map			
40	Sketch essential featu			
41	Arrange visual eleme			
42	Website Design Comp			
43	Instructional Design	7 days	Mon 3/20/23	Tue 3/28/23
44	Analyze requirements	3 days	Wed 3/29/23	Fri 3/31/23
45	Identify learners	1 day	Fri 1/20/23	Fri 1/20/23
46	Develop learning obje	1 day	Fri 1/20/23	Fri 1/20/23
47	Determine Technolog	1 day	Fri 1/20/23	Fri 1/20/23
48	Instructional Design C	1 day	Wed 3/29/23	Wed 3/29/23
49	Security Design	7 days	Thu 3/30/23	Fri 4/7/23
50	Establish Protocols	2 days	Thu 2/23/23	Fri 2/24/23



ID	Task Name	Duration	Start	Finish
51	Establish Password e	1 day	Mon 2/27/23	Mon 2/27/23
52	Security Concepts co	2 days	Mon 2/27/23	Tue 2/28/23
53	Build Phase	5 days	Wed 3/1/23	Tue 3/7/23
54	Website build	1 day	Wed 3/29/23	Wed 3/29/23
55	Register Domain	3 days	Fri 5/19/23	Tue 5/23/23
56	Create website	5 days	Wed 5/24/23	Tue 5/30/23
57	Host website	1 day	Wed 3/29/23	Wed 3/29/23
58	Upload Content	14 days	Wed 5/31/23	Mon 6/19/23
59	Website Developmer	1 day	Mon 6/19/23	Mon 6/19/23
60	System/network buil	1 day	Fri 2/24/23	Fri 2/24/23
61	Create Network	1 day	Fri 2/24/23	Fri 2/24/23
62	Network Completed	1 day	Mon 2/27/23	Mon 2/27/23
63	Testing	1 day	Tue 2/28/23	Tue 2/28/23
64	Quality Testing	1 day	Wed 3/1/23	Wed 3/1/23
65	User Acceptance test	2 days	Thu 3/2/23	Fri 3/3/23
66	System testing	2 days	Mon 3/6/23	Tue 3/7/23
67	Security testing	2 days	Thu 6/8/23	Fri 6/9/23
68	Launch Learning Man	1 day	Mon 6/12/23	Mon 6/12/23
69	Marketing	12 days	Tue 6/13/23	Wed 6/28/23
70	Marketing Strategy	6 days	Thu 6/29/23	Thu 7/6/23
71	Develop Marketing St	1 day	Thu 6/22/23	Thu 6/22/23
72	Develop Marketing P	4 days	Fri 6/23/23	Wed 6/28/23
73	Marketing Plan Comp	1 day	Thu 6/29/23	Thu 6/29/23
74	Marketing Collateral	1 day	Fri 6/30/23	Fri 6/30/23
75	Source Advertising Pa	1 day	Fri 6/30/23	Fri 6/30/23

ID	Task Name	Duration	Start	Finish
76	Select Advertising Pa	1 day	Mon 7/3/23	Mon 7/3/23
77	Implementation of M	3 days	Tue 7/4/23	Thu 7/6/23

4.3.4 Sponsor Acceptance

Approved by the Project Sponsor

_____ Date: _____

<Project Sponsor>

<Project Sponsor Title>

4.4. Cost Management Plan

For this project, “The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System,” the key benefit of this process is

that it provides guidance and direction on how the project cost will be managed throughout the project. The Cost Management Plan key input process is the Project Charter, Schedule Management Plan and Risk Management Plan. The tools and techniques for developing this plan are expert judgement, data analysis and meetings.

The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System

COST MANAGEMENT PLAN

Nassau
The Bahamas

16 January 2023

Table of Contents

4.4.1 Introduction

4.4.1.1 Purpose

This document describes the Cost Management Plan for the project, “The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System.” The purpose of the Cost Management plan is to provide guidance and direction on how the project cost will be managed throughout the project.

4.4.1.2 Scope

The Cost Management Plan for the project, “The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System,” includes many internal and external cost components. All metrics and variance analysis must be applied to these cost components throughout the project lifecycle. These components include:

Internal

- Project Management
- Capital equipment.

External

- Implementation activities

4.4.2 Cost Management Approach

The cost management processes have been incorporated into the Cost Management Approach developed for the project, “The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System.” The Cost Accounts will be created at the second level of the WBS, with the creation of Control Accounts at this

level for cost tracking. Project financial cost performance will be measured and controlled using Earned Value Management.

4.4.2.1 Cost Planning and Estimating

Cost planning of the cost management plan was prepared based on the needs of the project. The project resources and requirements were finalized through the cost estimating process. These cost estimations included labor, equipment, facilities, services, and contingency costs. As demonstrated in the project budget, estimating was done at the activity level. The estimating process is important because it forms the project cost baseline and ultimately the project budget. The WBS element costs were summed, and this formed the request for funding for the project. The project cost baseline may only be changed with the authorization by the Project Sponsor.

A 5% Contingency Reserve and a 3% Management Reserve has been allocated for the project and will be the sole responsibility of the sponsor of the project. The funding remains fixed to the approved sum. Cost estimates were done using expert judgement, analogous, and historical estimating. The summary of the Activity Cost Estimates is as follows:

Chart 10 Activity Cost Estimates

Total Cost Estimate	$9,200
Contingency Reserve (5%)	$500
Cost Baseline	$9,700
Management Reserve (3%)	$300
Total Project Budget	$10,000

(Source: Author of Study)

4.4.2.2 Project Budget and Cost Baseline

The project budget is the combined costs of project activities or project work packages. The key benefit of this process is that it determines the cost baseline to be used for monitoring and controlling project performance. In cost control, the project budget is to be used for comparing budgeted costs versus actual costs. The process of developing the project budget is done once or at predefined points in the project.

Some of the information that is key in developing project budgets are:

1. Activity Cost Estimates
2. Basis of Estimates
3. Scope Baseline
4. Project Schedule
5. Contracts

The project budget once approved establishes the total cost of the project thus allowing stakeholders to understand how much money will be needed and its timeline. When the approved budget is signed, the Project Manager will review the cost allocation against the approved budget and adjust allocations, if required, to reflect the approved funding for the project. The cost allocations are then baselined after obtaining approval from the Project Sponsor.

Chart 11 Cost Estimates

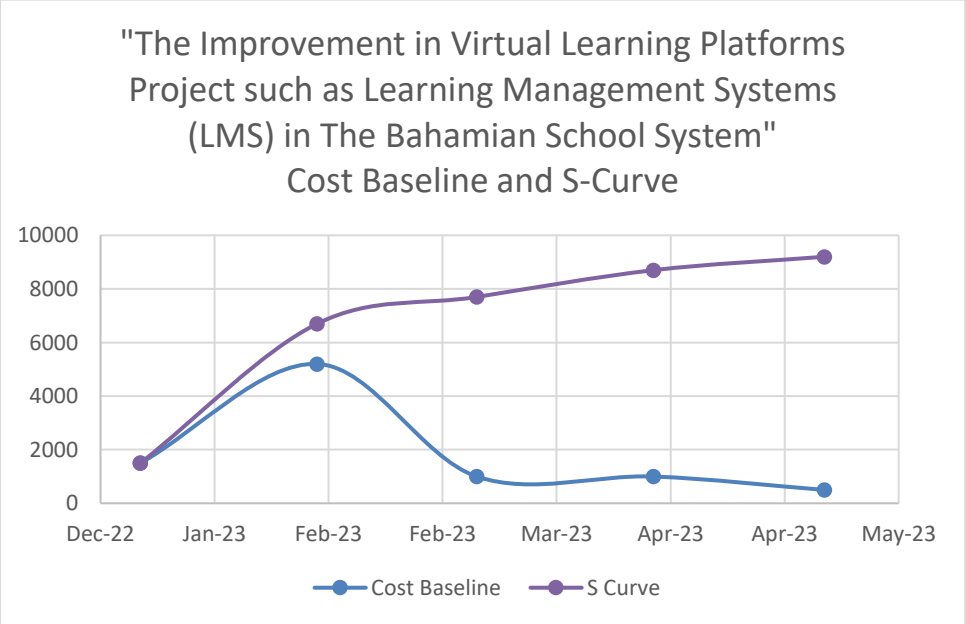
Component	Cost (USD) $
System Engineering	1500
Designing	1000

Human Resource	2700
Testing	1000
Hardware/Software	2500
Marketing	500
Sub-Total	9,200
Contingency Reserve (5% of total)	500
Management Reserve (3% of total)	300
Total	10,000

(Source: Author of Study)

The cost baseline per month and cumulative costs from the table above have been depicted in the graph below.

Chart 12 Project Cost Baseline Curve and S-Curve



(Source: Author of Study)

4.4.2.3 Cost Metrics and Reporting

To measure project performance, several metrics will be used to capture cost and schedule performance for the project. The following metrics will be compiled and reported by the Project Manager:

- Cost Variance (CV) will be reported monthly and in the project's Actual Costs (AC) subtracted from Earned Value (EV).
- Schedule Variance (SV) will be reported monthly and is the project's Planned Value (PV) subtracted from EV.
- The Cost Performance Index (CPI) will be reported monthly and is the project's EV/AC.
- Schedule Performance Index (SPI) will be reported monthly and is the project's EV/PV.

Each of the above metrics would have varying thresholds and interpretations that would lead the project manager to implement prescribed control measures.

When the CV and SV lie between +/- 0.1 the project manager would need to begin to pay close attention to the project status and document that variance. A move to a +/- 0.2 variance range should trigger a red flag and swift remedial action must be taken to normalize the project and return it to approved acceptable levels.

When the CPI or SPI goes less than 0.9 the project manager must put in the corrective actions to bring the project back to budget and time.

4.4.3 Approvals

Approved by the Project Sponsor

_____ Date: _____

<Project Sponsor>

<Project Sponsor Title>

4.5. Quality Management Plan

According to the PMBOK (2017), 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' objectives. Project Quality Management also supports continuous process improvement activities as undertaken on behalf of the performing organization. The key benefits of this process are that it increases the probability of meeting the quality objectives as identifying ineffective processes and causes of poor quality (p.271). For this project, "The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System," the key input process is the Project Management Plan, Project documents include lessons learned register, quality control measurements and quality metrics. The tools and techniques for developing this plan are data gathering, data analysis, decision making and problem solving.

The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System

QUALITY MANAGEMENT PLAN

Nassau
The Bahamas

16 January 2023

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4.5.1 Introduction

4.5.1.1 Purpose of the Quality Management Plan

For this project, “The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System,” the Project Quality Management the process of identifying quality requirements and/or standards for the project and its deliverables and documenting how the project will demonstrate compliance with quality requirements and/or standards. To ensure the best possible quality is provided for the Learning Management System, the Project Quality Management System will ensure that:

1. Provide products that lead to customer satisfaction.

2. Pay attention to proper understanding of the requirements of the users of the system.

3. Provide all agreed deliverables to the users in accordance with the schedules agreed upon.

4. Minimize complaints by taking all possible measures like maintaining records of complaints, using quality tools such root cause analysis, and creating suitable preventative measures.

5. To follow the prescribed intentionally set standards for measuring the quality of IT products.

4.5.2 Quality Management Approach, Planning and Overview

4.5.2.1 Quality Planning

The project manager will determine the quality standards and requirements for the project and will be primarily based on the standards of the Ministry of Education requirements as well as international standards with the goal of achievement of SDG 4: Quality Education.

4.5.2.2 Project Quality Management Strategy and Objectives

"The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System," project aims to:

1. Provide a product that leads to customer satisfaction.
2. Understanding the requirements of the users of the system.
3. Provide all agreed deliverables to the users in accordance with the schedules agreed upon.
4. Minimize complaints by taking all possible measures like maintaining records of complaints, using quality tools such root cause analysis and creating suitable corrective action measures.
5. To follow the prescribed international standards of virtual learning.

Table 11 Quality Management Key Components

Quality Review	Quality Measure	Quality Evaluation Methods
Project Deliverables	• Deliverable Quality Standards and Requirements • Completeness and Correctness	Quality Control Activities
Project Processes	• Process Quality Standards • Stakeholder Expectations	Quality Assurance Activities

(Source: Author of Study)

4.5.2.3 Quality Roles and Responsibilities

The process of translating the quality management plan into executable quality activities that incorporate the organization's quality policies into the project. The table below describes the roles and responsibilities necessary for quality management. Included also are the activities and goals of each role.

Table 12 Roles and Responsibility for Quality Management

Roles	Responsibilities	Activities	Goals
Project Manager	Delivers the Learning Management System to meet stakeholder	• To follow the prescribes internationally	• Measure the quality of the system

	expectations.	set standards for measuring quality of IT products. • Minimize complaints by taking all possible measures like, maintaining records of complaints, using quality tools such root cause analysis and creating of suitable preventive measures.	based on the use of internationally approved standards. • Ensure the system is free if errors and defects as to minimize user dissatisfaction.
Customer	Provides the quality expectations for the system being delivered by the		

	project.		
Project Team/Tester	Responsible for validating the test basis, designing, and developing test cases/ scripts and data sets, executing tests, reporting and diagnosing defects to the project manager.	• Pay attention to the proper understanding of the requirements of the users of the system. • Provide products that lead to customer satisfaction.	• Adhere to the surveys conducted and the elements the users require. • Deliver a user-friendly system.

(Source: Author of Study)

4.5.4 Quality Assurance

Quality Assurance is the preventative step taken to increase the likelihood of delivering a deliverable and achieving the quality targets set. The focus is to prevent deficiencies through planned and systematic activities in a proactive approach. Quality Assurance determines compliance to project policies and procedures with the goal of building quality into the final products, rather than having to test it later.

To secure quality assurance the following activities have been instituted:

1. Clear roles and responsibilities and minimum qualification requirements for the project team.
2. Frequent communication within the project.
3. Conduct Surveys to determine the progress of training sessions on virtual learning practices.
4. Minimum technical specifications virtual learning platforms and technical equipment for the given user capacity.
5. Conduct test runs to determine the functionality of the virtual learning platform.
6. Quality assurance evaluation of training consultants and other service providers.

The table below shows the acceptance requirements for the expected deliverables.

Table 13 Matrix of Quality Assurance

Deliverable	Acceptance Requirements	Metrics
Website Development Completed	Run the website offline to verify the links are functional and all the activities and exercises are uploaded.	• Review of Scope Management Plan • Allow some selected users to interact with the system to ascertain if it meets their satisfaction.
Website Design Completed	Design must fit user requirements	Review of Scope Management Plan

Network Completed	Network must be able to accommodate multiple (1000s) user logins at once	• Review of Scope Management Plan • Run the LMS on the network

(Source: Author of Study)

Quality assurance for the project will be performed by observation of the project processes, defining deliverable checklist, and conducting quality product reviews.

Below is a user experience survey to assist the LMS with adapting to the changing needs of the user.

Table 14 User experience of the LMS

Demographics What is your age?	5-12	12-14	15-18	18+		
LMS Role	Learner/Student	Tutor/Teacher	Parent/Guardian	Administrator		
Criteria	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	NA
The LMS keeps the learner informed						

through constructive, appropriate, and timely feedback.						
The LMS responds well to user-initiated actions. There is no delay in responses.						
Language usage in terms of phrases, symbols, and concepts is similar to that of learners in their day-to-day environment.						
The LMS is compatible with common						

browsers on common hardware (laptops, mobile devices, tablets etc.)						
LMS dialogues do not contain irrelevant or rarely needed information, which could distract users.						
The LMS is designed in such a way that the users cannot easily make serious errors.						
When a user, makes an error, the LMS						

responds with an appropriate error message.						
LMS messages define problems precisely and give quick, simple, constructive, specific instructions for recovery.						
Options to be manipulated, options for selection, and actions to be taken are visible.						
Instructions on how to use the LMS are visible or easily						

retrievable whenever appropriate.						
The LMS caters for different levels of users, from novice to expert.						
The LMS has a help facility and other documentation to support users' needs.						
Information in help facilities is easy to search, task-focused, and lists concrete steps to accomplish a task.						

The LMS has a simple navigational structure.						
Users know where they are and have the option to select where to go next.						
Related information is placed together.						
The LMS generates useful reports regarding the activities of learners and instructors in the courses, discussion						

forum, quizzes etc.						
Course analysis includes progress reports and consists of both the activities and timestamps of when the activity occurred.						
Learners' behavior tracking is integrated with gamification Academic Performance Indexes and platforms.						
Facilities and						

activities are available that encourage learner-learner and learner-instructor interactions.						
Facilities are provided for both asynchronous and synchronous communication (such as e-mail, discussion forums etc.).						
Learners have some freedom to direct their learning.						
Instructors can customize						

learning artifacts to the individual learner (e.g. tests and performance evaluations can be customized to the learner's ability).						
The LMS supports different strategies for learning.						
The LMS can be easily integrated with other media (blogs, YouTube, Twitter feeds) to support learning.						
Learners give and receive						

prompt and frequent feedback about their activities and the knowledge being constructed.						
Quantitative feedback, e.g. grading of learners' activities, is given, so that learners are aware of their level of performance.						
The LMS incorporates interactive features that						

attract and motivate learners.						
Gamification elements (when available) are easy to use by the instructors to further develop the student's learning environment.						
The LMS provides features to assess learners' interests, gaps on their knowledge and skills.						

(Source: Zaharias & Pappas, 2016, p. 80-82)

The table below serves as a qualitative checklist to analyze aspects of the quality management plan for improvements where necessary.

Table 15 Qualitative Checklist

Quality Item	Yes	No	N/A	Date	Comments
Has the quality management plan been reviewed by all stakeholders?					
Is the quality management plan consistent with the rest of the overall project plan?					
Have product and process quality metrics been					

established, reviewed, and agreed upon?					
Do all metrics support a quality standard which is acceptable?					
Have Quality Metrics Review Meetings been scheduled throughout the project's duration?					
Are all metrics clear, measurable, controllable,					

and reportable?					
Is the project team familiar with the project's quality review process?					
Does the project have an appropriate number of resources assigned for quality assurance and control?					

(Source: Project Management)

The checklist above will be used by the project team to track faults or errors. If there is a 'no' response, the project manager would revert to the location of best fit or trace and endeavor to repeat steps to ensure on the next evaluation a 'yes' response is obtained.

4.5.5 Corrective Actions and Quality Reporting

If non-conformities are identified, they should be documented in the appropriate form and corrective actions should be applied.

Corrective actions should ensure:

- Effective handling of complaints
- Reports on non-conforming complaints
- Investigation of the cause if non-conformities
- Recording the results of the investigation
- Determining the corrective/preventing actions intended to eliminate the cause of the nonconformity.
- Application of controls to ensure that corrective actions are taken and effective.

4.5.6 Approvals

Approved by the Project Sponsor

_____ Date: _____

<Project Sponsor>

<Project Sponsor Title>

4.6. Resource Management Plan

. For this project, “The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System,” the key input process is the

Project charter, Quality Management plan and Project documents such as project schedule, requirements documentation, risk register and stakeholder register. The tools and techniques for developing this plan are expert judgement, data representation and meetings.

The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System

RESOURCE MANAGEMENT PLAN

Nassau
The Bahamas

16 January 2023

Table of Contents

4.6.1 Introduction

The resource management plan for the project, “The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System,”

establishes the approach and level of management effort needed for managing the project resources based on the type and complexity of the project.

4.6.2 Resources Allocated

This is the process of defining how to estimate, acquire, manage, and utilize physical and team resources. The roles and responsibilities of each team member are described in the table below:

Table 16 Roles and Responsibilities in the Human Resource Management Plan

Title	Roles and Responsibilities	Skills
Project Manager	• Defining scope and specifications of the Project. • Strategize and Prepare site logistics. • Prioritize the activities in sequence/ Preparation of WBS. • Planning and Scheduling (Timeline). • Quantity Estimate. • Resource estimation. • Budgeting. • Deployment of resources. • Execution. • Risk Identification and Mitigation. • Monitoring and controlling. • Management Information Systems. • Quality Control. • Safety ("Project manager responsibilities," 2022).	• Communication. • Leadership. • Organization. • Time Management. • Risk Management. • Budget Management. • Problem-solving. • Adaptability. • Teamwork. • Technical expertise (Kelley, 2020).
Project Team Members	• Assist the project manager in planning	• Basic Management.

	work packages, creating schedules and cost estimates. • Responsible for completing assigned work on the project during the execution phase. This may include design, build, testing against requirements, operational assessment, and implementation activities. • Identify risks and opportunities throughout the project and may help in formulating the appropriate responses to these. • Actively participate in project team meetings and promptly communicate issues to the project manager ("Project roles and responsibilities," n.d.).	• Problem-solving. • Conflict resolution. • Technical documentation. • Risk Management. • Customer and client Management (LiquidPlanner, 2021).
Instructional Designer	• Develops and designs courses and curriculum. • Edits and develops online learning materials. • Creates learning experiences and environments. • Designs learning activities, assignments, and assessments. • Creates computer-based training (CBT)	• Knowledge of instructional theory, including assessment. • Proficiency with learning management systems (LMS). • Understanding of web site design best practices. • Excellent project management and organizational skills. • Experience with design platforms.

	modules and storyboards. • Develops instructor's manuals, rubrics, and other teaching tools. • Collaborates with subject experts to develop course content. • Manages online learning communities. • Analyzes, updates, and refines existing online content. • Trains instructors, students, and employees in how to use learning technologies. • Facilities discussion and collaboration via social media. • Keeps current on best practices instructional design. • Writes scripts for video and audio content. • Works with technical staff to troubleshoot problems reported by users ("Instructional designer job description template," 2021).	• Familiarity with course management systems. • Excellent written oral communication skills, including the ability to effectively convey technical information to non-technical colleagues and clients. • Critical thinking skills. • Ability to prioritize and manage multiple simultaneous deadlines ("Instructional designer job description template," 2021).
Systems Administrator	• Maintaining a Learning Management System. • Making sure that the operational performance of the software is on track. • Providing technical	• Exceptional computer and software skills • Knowledge of multiple web design technologies such as HTML and JavaScript. • Familiar with course design and

	leadership in support of the system. • Define user roles. • Working with LMS providers to remain up to date on system specifications and updates. • Identifying any opportunities for process and quality improvements. • Providing feedback on any defects that may be present. • Communicating any changes to the field as needed. • Creating training courses for employees on a weekly, monthly, or yearly basis. • Maintaining procedures to ensure the security and integrity of systems. • Providing end-user support when needed ("What does an LMS administrator do? | Career insights & job profiles," 2022).	development. • Strong data entry skills. • Experience with Microsoft Office programs such as Excel and Power Point. • Experience in managing data electronically. • Strong communication skills. • Strong technical skills. • Ability to manage time effectively and efficiently. • Strong attention-to-detail ("What does an LMS administrator do? | Career insights & job profiles," 2022).

(Source: Author of Study)

4.6.3 Resource Requirements

The detailed resource requirements for the project have been developed and outlined below:

A third-party software developer (supplier) that has experience in designing/customizing and delivering LMS software, where the Ministry of Education can publish/operate online courses and learning-contents via its own LMS platform, whenever possible.

- Platform identification and customization
    - An open-source LMS system that is user-friendly, engaging and flexible. It should also be adapted to the requirements of our target audience and fully suited to the Ministry of Education's needs and strategic goals.
    - Customizing the LMS system which is selected so it is tailored to the needs of the Ministry of Education and complies with students and teachers visual and functional standards.
    - Training the relevant staff within the Ministry of Education on how to operate the LMS.
- Platform hosting and maintenance
    - Hosting the LMS for a period of 3 years.
    - Providing the relevant technical support to the Ministry of Education so ut can manage the LMS platform.

Experience

Description of former experience with working on a similar project. Experience designing launching and managing a Learning Management System. The Ministry of Education will rank the bids based on received information based on the level of detail, harmony with the objectives and based on international practices.

Learning Management Service development and management experience: Minimum experience 5 years.

Public sector customer experience: Minimum 3 years' experience.

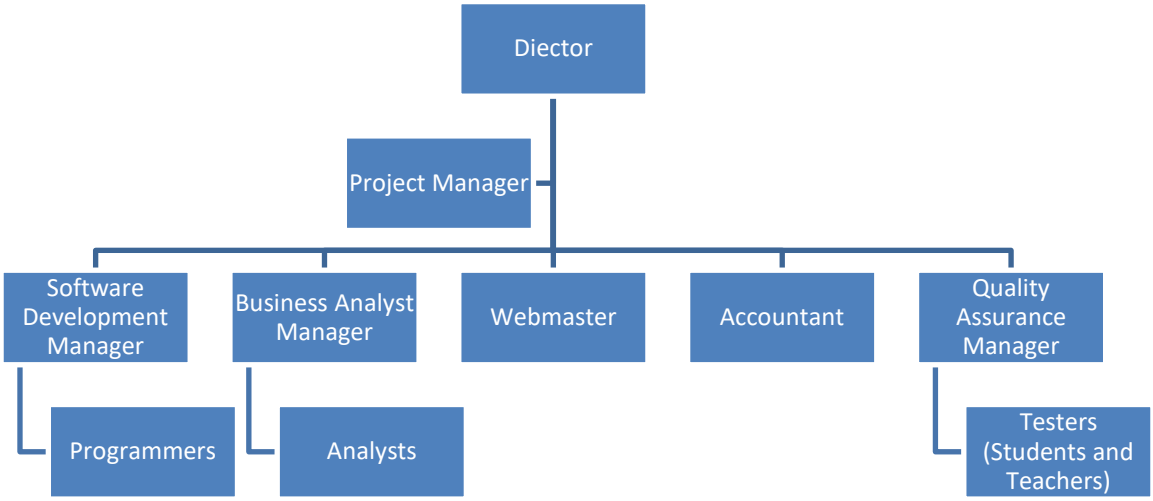
Experience with leading e-learning platforms. Minimum experience with 2 leading e-learning platforms.

Experience in developing online training.

4.6.4 Resources Breakdown

The resource breakdown structure is the hierarchical representation of resources required by the project.

Chart 13 Resource Breakdown Structure



(Source: Author of Study)

4.6.5 Acquisition of Resources

The Ministry of Education does not have a full project team dedicated to this project, however before the commencement of this project, a full project team as detailed in this plan will be present. The project team is then considered pre-assigned resources. The consultants and service

providers, as well as the physical resources, will be hired in accordance with the procedures under the Procurement Management Plan.

4.6.6 Project Team Assignments

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

Table 17 RACI Chart

Activity	Project Sponsor	Project Manager	Web Administrator	Systems Administrator	Project Team
Project Initiation	R	A	I	I	I
Collect Sponsor Requirements	C	A	I	I	R
Meet with Sponsor		R	I	I	R
Establish Project Requirements/Scope	C	A	I	I	R
Project Defined	C	A	I	I	R
Market Research	I	A	I	I	R
Conduct Market	C	A	I	I	R

Survey					
Collect Information	I	C	I	I	R
Analyze Information	C	A	I	I	R
Present Findings	I	C	I	I	R
Determine Software Requirements Specification	I	A	I	R	A
Determine Hardware Requirements Specification	I	A	R	O	C
Determine Security Requirements Specification	I	R	I	A	C
Identify Key Stakeholders	C	R	I	I	A
Product Defined					
System Design	I	R/A			
User Interface	I/C	A	R	C	C

Design					
Instructional Design	I	A	C	R	C
Analyze requirements					
Identify learners	I	A	I	R	C
Develop learning objectives	I	A	I	R	C

(Source: Author of Study)

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

4.6.7 Team Development and Performance Assessments

Team development is the process of improving competencies, team member interaction, and the overall team environment to enhance project performance. A typical team develops through the following stages:

1. Stage 1: Forming

   During this stage, the team is created with clear structure, goals, direction and roles so that members begin to build trust. A good orientation process can help to ground the members in terms of the team's mission and goals and can establish team expectations about both the team's product and process.

2. Stage 2: Storming

During this stage, the team is tasked with focusing on its goals and breaking them down into smaller achievable steps. The team develops both task-related skills and conflict management skills.

3. Stage 3: Norming

   During this stage the team is usually focused on the team's goal and an increase in productivity is seen. An evaluation of the team processes and productivity can be done.

4. Stage 4: Performing

   During this stage, team commitment to the goals are high. Team members are showing an increase in competence and are deepening their knowledge and skills for continuous improvement ("Using the stages of team development," n.d.).

Team Management is the process of tracking team member performance, providing feedback, resolving issues, and managing team changes to optimize project performance. A Project Manager may employ the following tactics to manage their team specifically for the improvement of the Learning Management Systems project:

1. Identify your working and leadership style.
2. Establish clear roles, responsibilities, and expectations.
3. Empower your team to make smart decisions.
4. Encourage listening and feedback.
5. Foster trust, belonging and inclusivity.
6. Encourage a growth mindset.
7. Provide coaching ("Developing teams: 7 steps to building your dream team," 2022).

At the beginning of this project, the Project team will meet with the Project sponsor to establish clear roles and responsibilities. Throughout this project, a performance review will be done by the Project manager to address any improvements that need to be made.

4.6.8 Sponsor Acceptance

Approved by the Project Sponsor

_____ Date: _____

<Project Sponsor>

<Project Sponsor Title>

4.7. Communications Management Plan

A Communications Plan is important for the successful development of a project management plan for the improvement of the virtual learning platform in The Bahamian School System for hybrid learning. Project Communications Management includes the processes necessary to ensure that the information needs of the project and its stakeholders are met through development of artifacts and implementation of activities designed to achieve effective information exchange. Project Communications Management consists of two parts. The first part is developing a strategy to ensure communication is effective for stakeholders. The second part is carrying out the activities necessary to implement the communication strategy (PMBOK, 2017, p 359).

For this project, “The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System,” the key input process is the Project charter, Resource management plan, Stakeholder engagement plan, Project documents

such as requirements documentation, and stakeholder register. The tools and techniques for developing this plan are expert judgement, communication requirements analysis, communication methods, data representation and meetings.

The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System

COMMUNICATIONS MANAGEMENT PLAN

Nassau
The Bahamas

16 January 2023

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4.7.1 Introduction

The purpose of this project is to develop the Communications Management Plan to ensure open communication with all stakeholders for the improvement of the virtual learning platform for hybrid learning in the Bahamian School System. This plan identifies target audiences, methods of communication, frequency of communication and guidelines.

4.7.2 Communications Objectives

The key communication objectives for the project, "The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System," are:

1. Comprehension and use of proper communication framework.
2. Clear and consistent communication with recipients.
3. Accurate and timely information about the project.

4.7.3 Communications Management Assumptions

The success of this plan is based on the following:

- The Ministry of Education will provide all the necessary support to the project team for the execution of the communication plan by utilizing the presented guidelines and methods of communication.
- There will be open and clear lines of communication.
- Consistent and informative messages will be communicated.

4.7.4 Stakeholder Communications Requirements

This section identifies the number of stakeholders involved in this project and the communication requirements for each audience.

Table 18 : Stakeholder Communication Delivery Methods

Stakeholders		Method
Sponsor	Project Manager	Email, telephone calls, reports, meetings
Project Manager	Project Team	Email, telephone calls, reports, meetings
Project Manager	LMS Administrator/Technical Team	Email, telephone calls, reports, meetings
Project Manager	Website Developer	Email, telephone calls, reports, meetings
Project Manager	Ministry of Education	Email, telephone calls, reports, meetings
Systems Administrator	Vendors	Emails, brochures, meetings
LMS Administrator/Technical Team	Vendors	Emails, brochures, meetings
Ministry of Education	Teachers, Students, Parents	Email, questionnaires, reviews
Project Team	Ministry of Education, Teachers, Students, Parents	Social Media, websites

(Source: Author of Study)

4.7.5 Communications Directory

The following table will be used to record the contact information for all persons identified in this communications management plan. The email addresses and phone numbers in this table will be used to communicate with these people.

Table 19 Project Communications Directory Template

Role	Name	Title	Organization/Department	Email	Phone
Project Sponsor					
Project Manager					
Project Stakeholders	See Stakeholder Register	See Stakeholder Register	See Stakeholder Register	See Stakeholder Register	See Stakeholder Register
Project Team					

(Source: Author of Study)

4.7.6 Project Communications Matrix

The Project Communications Matrix details the project's communications requirements, the medium of communication and frequency of communication with all stakeholders.

Table 20 Communications Matrix

Communication Type	Objective of Communication	Channel/ Medium	Frequency	Audience	Owner	Deliverable

Initial Meeting	Introduce the project and the project team. Review Project Objectives and Management Approach	Face to face, Video Conference	Once	Project Sponsor, Project Team	Project Manager	Agenda, Meeting Minutes, Course of Action
Project Team Meetings	Review status of the project with the team	Face to face, Video Conference	Weekly	Project Sponsor, Project Manager	Project Manager	Agenda, Meeting Minutes, Project Schedule, Project Updates
Project Status Meetings	Report on the status of the project	Face to face, Video Conference	Monthly	Project Sponsor, Project Manager	Project Manager	Project Schedule, Project Updates

Project Status Reports	Report on the status of the project including activities, progress, costs and issues	Email, Printed Reports	Monthly	Project Sponsor, Project Team	Project Manager	Project Status Report, Project Schedule
Project Announcement	Inform and engage stakeholders about LMS	Website	Daily	All Stakeholders	Project Manager Website, Developer/Manager	Website update
Personal Communication	Inform and engage stakeholders about LMS	Social Media, Telephone, email	Daily	All Stakeholders	Project Manager, Marketing Manager	Social Media updates, telephone calls, emails
Review Meetings	Engaging stakeholders through a forum	Face to face	Quarterly	High Priority Stakeholders	Project Manager	Project updates

	specific to discussing education and the role each person plays					

(Source: Author of Study)

4.7.7 Communication Escalation Process

As issues or complications arise with regards to project communications it may become necessary to escalate the issue if a resolution cannot be achieved within the project team. Project stakeholders may have many different conflicting interests therefore to resolve communication issues that may have an impact on the project, the communication escalation process is as follows:

Table 21 Communication Escalation Process

COMMUNICATION ESCALATION PROCESS			
Priority Level	Definition	Decision Authority	Timeframe for Resolution
Level 1	Major impact to project with significant impact to schedule, budget or scope	Project Sponsor	Within 2 working days

Level 2	Moderate impact to project with potential impacts to schedule, budget, and scope	Project Manager	Within 3 working days
Level 3	Minor impact with potential delays in schedule but no impact to cost	Project Manager	Within 5 working days

(Source: Author of Study)

4.7.8 Change Requests

Changes to the communication process, format or content may be proposed by any recipient or communication creator. The Project Manager must receive the requested change request via email to approve the proposed change for it to be implemented. When approved, the new content must be disseminated with an explanation of the change with appropriate revision and version markings included in the updated version.

4.7.9 Sponsor Acceptance

Approved by the Project Sponsor

_____ Date: _____

<Project Sponsor>

<Project Sponsor Title>

4.8. Risk Management Plan

According to the PMBOK (2017), Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project. The objectives of project risk management are to increase the probability and/or impact of positive risks and to decrease the probability and/or impact of negative risks, to optimize the chances of project success (p.395).

For this project, “The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System,” the key input process is the Project charter, and stakeholder register. The tools and techniques for developing this plan are expert judgement, data analysis and meetings.

The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System

RISK MANAGEMENT PLAN

Nassau
The Bahamas

16 January 2023

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4.8.1 Introduction

4.8.1.1 Purpose

The seven (7) knowledge areas of Project Risk Management were applied to develop a project management plan for the improvement of the learning management system (LMS) virtual learning platform in the Bahamian school system for hybrid learning. Project Risk Management

includes the systematic processes of risk management planning, identification, analysis, response planning, response implementation, and monitoring project risks. It includes maximizing the probability and impact of positive events and minimizing the probability and impact of adverse events to optimize the chances of project success. The Risk Management Plan defines risk management activities and how the project team will handle risks to achieve project objectives.

4.8.1.1 Risk Definition

Risk is any unexpected event that can affect the project – for better or for worse. Risk can affect anything: people, processes, technology, and resources. An important distinction to remember is that risks are not the same as issues. Risks are events that might happen, and you may not be able to tell when – such as flu affecting the team all at once, or a key product component being on backorder ("What is risk in project management?," n.d.).

4.8.2 Risk Management Approach

The Risk Management Approach established for the project is a methodical process that starts from identifying risks to the point of implementing project risks. For the purposes of this project, Risk Management will include Plan Risk Management, Identify Risks, Perform Qualitative Risk Analysis and Plan Risk Responses.

The first step in Project Risk Management is the Plan Risk Management process. This process first began when the project was conceived. In project formulation and evaluation, risk identification was an important consideration. These risks have been included in the Project Charter. The Project Charter is the main input for the Plan Risk Management process, where the Project Risk Management Plan will be developed. A Risk Register will capture the details of

identified individual project risks. The individual project risks identified will be grouped into risk categories using a Risk Breakdown Structure (RBS).

4.8.3 Risk Identification

4.8.3.1 Risk Breakdown Structure

This risk breakdown structure will be used to structure and guide the risk management process through the understanding of the distribution of risk in effective risk management.

Table 22 Risk Breakdown Structure (RBS)

LEVEL 0	LEVEL 1	LEVEL 2	LEVEL 3
Project risk	External	Economic	Labor Market
			Labor conditions
	Industry	Market	Change in demand
			Availability of raw materials
	Environment	Statutory	Planning approval delay
			Ecological constraints, environmental impact assessment etc.
	Client	Client team	Client representative fails to perform duties

			Client team responsibilities ill-defined
		PM team	Inadequate project management controls
			Incorrect balance of resources and expertise
			PM team responsibilities ill-defined
		Targets	Project objectives ill-defined
			Project objectives changed mid-design
			Conflict between primary and secondary objectives
		Funding	Late requirement for cost savings
			Inadequate project funding

			Funds availability does not meet cash flow forecast
			Untimely payments for completion of work phases
		Tactics	Poor team communication
			Unstructured changes in core team
			Inadequate number of staff
			Inability to comply with design sign-off dates
			Change control procedure not adhered to or accepted
	Project	Team	Poor team communication
			Changes in core team
			Inadequate number of

			staff
			Individual roles and responsibilities not clearly defined
		Tactics	Cost control
			Time control
			Quality control
			Change control
		Tasks	Site
			Design

(Source: Author of Study)

4.8.4 Probability and Impact Scales

When risks are identified they are evaluated on a two (2) dimensional matrix using a qualitative rating of the probability of the event occurring and the impact scale (impact on project objectives). Risks are analyzed by combining the probability and impact to produce a level of risk. This form of evaluation provides a good graphical representation of how serious the risk is and where it lies within a group of risks. This risk analysis provides critical information in determining what risks need to be treated and what risks are accepted.

4.8.4.1 Probability of Occurrence

The following chart defines the probability of occurrence.

Chart 14 Probability of Risks

Probability of Risks	
Rating	Interpretation
1	Event is not expected to happen within the next 12 weeks and may only occur in exceptional situations.
2	Event has been an infrequent occurrence in past projects. Even is expected to happen within the next 8 to 12 weeks.
3	Event has an even chance to occur at sometime within the next 6 to 8 weeks of the project.
4	Event has occurred in past projects and is expected to happen in the next 4 to 6 weeks.
5	The event is expected to happen within 4 weeks. It has occurred in past projects and conditions exist for it to occur in this project.

(Source: Author of Study)

4.8.4.2 Risk Impact

The table below shows the Impact Scale. The Impact Scale seeks to give a numerical value to the risk occurring that would affect project constraints like schedule, cost, scope and quality. It is referenced in a scale from a Very low impact (easily ignored) to a Very high impact (with very important costs taking the toll).

Table 23 Impact Scale

Impact scale	Description	Number
Very low (VL)	Impact may be safely ignored	0.05

Low (L)	Impact minor with routine management procedures	0.20
Medium (M)	Large impact, but can be managed with effort using standard procedure	0.40
High (H)	Critical event, potential for major costs, or delays	0.60
Very high (VH)	Extreme event, potential for large, financed costs or delays or damage to the project reputation	0.85

(Source: Author of Study)

4.8.4.3 Probability and Impact Matrix

All risks have a probability of occurring. The project manager and the project team will generate a Probability Scale and give the identified risks a value according to the table created. The following probability scale table is used to qualify the identified risks from a Very low probability to a Very high probability of occurring.

Table 24 Probability Scale

Probability Scale	Description	Number
Very low (VL)	Possible, but very unlikely	0.05
Low (L)	Possible, but unlikely	0.15

Slightly low (SL)	Possible, but slightly unlikely	0.3
Medium (M)	Possible, and likely	0.5
Slightly high (SH)	Likely	0.7
High (H)	Highly likely	0.85
Very high (VH)	Very highly likely	0.95

(Source: Author of Study)

The probability and impact matrix is a part of the qualitative analysis in risk management. The matrix is a grid used to map the probability of each risk occurrence and its impact on the project objective if the risk occurs (PMBOK, 2017). The matrix uses the Priority scale ratings from Table 3 and the Impact scale ratings from Table 2. The Probability and impact matrix is calculated by multiplying the ratings from the two tables above to provide the numeric rating shown in Table 4. Numeric calculations ratings range from 0.00 to 0.95 where by 0.00 is low probability and low threat or opportunity. The matrix also allows for risk to be categorized as a threat or opportunity and to determine where on the matrix such risk falls under each category. This allows the team to prioritize and strategize on how to resolve the risk.

The color provided in the Probability and impact matrix reference identifies the impact and probability of the risk to occur to the project. Numerical calculation results that are colored green generally means the risk does not impact the project significantly and can be ignored. Numerical calculations results that are colored yellow generally means the probability is medium to high, but the threat or opportunity is low meaning the management of the risk would require some routine management procedure. Numerical calculations resulting in red is considered to have a high probability of occurrence and threats and opportunities are medium to

very high. This generally means these risks will require intervention or can delay the project schedule, cost, or scope. These risks will then be the priority risk to alleviate and develop planning solutions from the onset. The Risk register will detail the risk identified by the team along with the Priority and Impact determined and calculate the Probability and Impact which will then use the Table to identify where the risk falls within the table and the team can then prioritize the risk and plan accordingly for the project.

Table 25 PxI Scale

	Threats					Opportunities				
Probability scale	VL (0.05)	L (0.20)	M (0.40)	H (0.60)	VH (0.85)	VH (0.85)	H (0.60)	M (0.40)	L (0.20)	VL (0.05)
VH (0.95)	0.05	0.19	0.38	0.57	0.81	0.81	0.57	0.38	0.19	0.05
H (0.85)	0.04	0.17	0.34	0.51	0.72	0.72	0.51	0.34	0.17	0.04
SH (0.70)	0.04	0.14	0.28	0.42	0.60	0.60	0.42	0.28	0.14	0.04
M (0.50)	0.03	0.10	0.20	0.30	0.43	0.43	0.30	0.20	0.10	0.03
SL (0.30)	0.02	0.06	0.12	0.18	0.26	0.26	0.18	0.12	0.06	0.02
L (0.15)	0.01	0.03	0.06	0.09	0.13	0.13	0.09	0.06	0.03	0.01
VL (0.05)	0.00	0.01	0.02	0.03	0.04	0.04	0.03	0.02	0.01	0.00

4.8.5 Risk Register

The process of Identifying Risks results in the formulation of the risk register. The risk register refers to one document encompassing the entire risk management process, which will be constantly updated with information as the risk management processes are completed. In other

words, the risk register is a project document that serves as a repository to record the outputs of risk management processes (PMBOK, 2017). The risk register contains different information at different points in the risk management process. The following risk register provides a detailed description (RBS Code, Cause, Risk, Consequence, Probability, Impact, PxI, Trigger, Owner, Strategy and Cost) of each risk identified for the project:

Table 26: Risk Register

Code	Cause	Risk Description	Consequence	Probability (0.1 – 0.9)	Impact (0.5 – 0.8)	Rank (P x I)	Trigger	Responsible Individual
1.0	If materials not readily available	Due to import/logistics shipping crisis	Delay in schedule.	0.3	0.5	0.15	Changes in shipping route	Project Manager Sponsor
2.0	If there is inadequate supply of funding	Due to underestimation of project magnitude	Delay in project schedule, increased cost	0.5	0.5	0.25	Sponsor running out of money	Sponsor
3.0	If hardware/software is not suitable for the system	Due to inadequate technical planning	Quality of platform will be poor as the platform will not be able provide all the features	0.3	0.5	0.15	Software component not able to run on the platform	Project Team Member
4.0	If network is unable to handle user traffic	Due to poor system architecture	Frequent system crashes	0.3	0.5	0.15	More users than expected at one time.	Project Team Member Systems Administrator
5.0	If the Ministry of Education is	Due to the requirements necessary	Skilled members will have to	0.7	0.5	0.35	Confirmed lack in	Project manager

	unable to attain expert team members	for the creating, implementing and maintaining the LMS	be brought in which may increase cost and delay the schedule				numbers of exerts on the team	

(Source: Author of Study)

4.8.6 Risk Qualification and Prioritization

Once risks are identified it is important to determine the probability and impact of each risk in order to allow the project manager to prioritize the risk avoidance and mitigation strategy. Risks that are more likely to occur and have a significant impact on the project will be the highest priority risks while those which are more unlikely or have a low impact will be a much lower priority.

4.8.7 Sponsor Acceptance

Approved by the Project Sponsor

_____ Date: _____

<Project Sponsor>

<Project Sponsor Title>

4.9. Procurement Management Plan

According to the PMBOK (2017), Project Procurement Management includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team. Project Procurement Management includes the management and control processes required

to develop and administer agreements such as contracts, purchase orders, memoranda of agreements (MOAs), or internal service level agreements (SLAs). The personnel authorized to procure the goods and/or services required for the project may be members of the project team, management, or part of the organization's purchasing department if applicable (p.459).

For this project, "The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System," the key input process is the Project charter, Scope Management Plan, Quality Management Plan, Resource Management Plan, requirements documentation and traceability matrix, resource requirements and stakeholder register. The tools and techniques for developing this plan are expert judgement, data gathering, data analysis and meetings.

The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System

PROCUREMENT MANAGEMENT PLAN

Nassau
The Bahamas

16 January 2023

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4.9.4 Procurement Risks and Risk Management

4.9.5 Cost Determination

4.9.6 Standardized Procurement Documentation

4.9.7 Procurement Constraints

4.9.8 Contract Approval Process

4.9.9 Decision Criteria

4.9.10 Vendor Management

4.9.11 Performance Metrics for Procurement Activities

4.9.12 Sponsor Acceptance

4.9.1 Introduction

Projects have a level of purchase for goods and services to conduct the activities through the end. There must be proper procurement techniques to ensure that monies are spent properly, and the right goods and services are purchased. In addition to the buying and selling decisions to be made this process also deals with contractual arrangements and management.

4.9.2 Procurement Management Approach

The Project Manager will maintain oversight and management of all procurement activities over the project, “The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System,” with key assistance from the Project lead who holds the responsibilities for procurement and logistics. The Ministry of Education will provide logistical support to the project team in ensuring that all items needed for

successful completion of the project are procured. The Project Manager will review the procurement list with the Ministry of Education representative for approval. All procurement will be conducted through vendor selection and a determination will be made on whether to lease (rental) or buy the item or service. All procurement activities carried out should reflect fairness, integrity, and transparency.

4.9.3 Contract Type

For this project, Firm Fixed Price (FFP) contracts will be utilized. The scope of works and duration of services required will be clearly defined and the price of the contract will not change unless the scope of work changes.

4.9.4 Procurement Risks and Risk Management

The Procurement of items have a probable occurrence of potential risk during implementation. The associated procurement risk for consideration in line with this analysis have been identified for consideration:

Table 27 Procurement Risks and Risk Responses

	Procurement Risk	Risk Response
1.	Delays in shipping due to inclement to severe weather (Hurricanes).	-Accept the risk and use contingency reserve for additional cost. -Identify alternative shipping routes and providers.
2.	The technology may not be available or increases in	-Identify alternative sources of

	price at the time of purchases	supply in advance
3.	The specifications provided by the manufacturer does not meet the requirements for the prescribed activity.	-Seek additional funding from project sponsor through a change request.

(Source: Author of Study)

4.9.5 Cost Determination

Cost determination for this project is based on the procurement method. This project utilizes Competitive Shopping and Direct Contracting for procurement of goods and works such as facilities and routine products (equipment). For the selection and contracting of consultants, Fixed Budget, Quality and Cost-Based Selection and Sole Source are used as the procurement methods.

Table 28 Goods and Services to be Procured

Goods to be Procured	Services to be Procures
Webserver	Web Administrator
Website domain	Instructional Designer
Bandwidth for server	System Administrator
Software platform (open source, general or custom built)	

(Source: Author of Study)

4.9.6 Standardized Procurement Documentation

The project team consistently follows standard documentation policies in all project activities. As part of project procurement, the following standard documents will be produced to ensure proper documentation of all the procurement activities involved. The standard documents for project procurement will include:

1. Terms of Reference/Scope of Work Template
2. Request for Proposal Template
3. Request for Quotation Template
4. Budget Guide
5. Bidding Documents
6. Method of evaluation and evaluation criteria
7. Internal Source Selection Evaluation Forms
8. Non-disclosure agreement
9. Letter of intent
10. Contract Template
11. Procurement Performance Evaluation Form
12. Lessons Learnt Form

4.9.7 Procurement Constraints

- **Cost**

The main procurement constraint of this project is cost. The project budget has been established and a contingency reserve is a available but there are costly aspects of the project that are subject to change. The costs of this e-learning project represent 45% of the evaluation process. For the purpose of this tender, the budget allocated to this task cannot be

communicated. Overall, the Ministry of Education has a total budget of $50,000 USD for the duration of 3-year operational work packages (content redesign and infrastructure set-up). The LMS implementation falls within the ‘Infrastructure’ work packages. The majority of the resources are allocated to content redesign. This tender covers only the learning management system implementation.

- **Time Constraints for Vendor/Consultant Selection**

  The time allotted for the selection of vendors and consultants is short given the nature of the project.

4.9.8 Contract Approval Process

The contract approval process commences when a determination is made to procure a good or service. Goods and services for the project are procured externally. Approval of the documents must be obtained from the Project Manager before issued externally. When proposals, bids or price quotations are received the evaluation is done by the project team according to the established decision criteria.

4.9.9 Decision Criteria

Fixed Budget Selection is used for assignments where the TOR and staff input can be precisely defined and where the cost cannot exceed a fixed budget amount. For this project, technical proposals submitted will be evaluated based on the quality of the consultant.

The technical proposal will be evaluated for:

- The consultant’s professional qualifications, experience and relevant experience for the assignment.

- The thoroughness of the consultant's methodology and approach, including its comments on the TOR.
- The qualifications and expertise of the key staff proposed for the assignment.

The financial proposal will be evaluated based on:

- Realistic cost estimates of staff time and other critical inputs are included in the technical proposal to ensure that the financial proposal adequately reflects the technical commitments of the consultant.

The project manager would therefore:

- Prepare the procurement statement of work (SOW) or terms of reference (TOR).
- Prepare a high-level cost estimate to determine the budget.
- Advertise the opportunity.
- Identify a short list of qualified sellers.
- Prepare and issue bid documents.
- Prepare and submit proposals by the seller.
- Conduct a technical evaluation of the proposals including quality.
- Perform a cost evaluation of the proposals.
- Prepare the final combined quality and cost evaluation to select the winning proposal.
- Finalize negotiations and sign contracts between the buyer and the seller.

The Service Agreement below will be used in the Procurement Process.

SERVICE AGREEMENT

This Service Agreement is hereby made by and between: The Ministry of Education and [Company Name]. Whereas One on One has launched a procurement procedure for the services described in Lot 1 and 2 and the Supplier has been selected based on the company's Experience and Quality as per the standards described in each section.

Both parties have agreed on the above stipulations and any changes made must brought the other party's immediate attention to avoid a breach in the contract

The Ministry of Education wishes to partner with a third-party software developer (supplier) that has experience in designing/customizing and delivering LMS software, where the Ministry of Education can publish/operate online courses and learning-contents via its own LMS platform, whenever necessary.

The scope of the work includes 2 lots:

Lot 1: Platform identification and customization

- Identifying an open-source LMS system that is user-friendly, engaging and flexible. It should also be adapted to the requirements of our target audience and fully suited to the Ministry of Education's needs and strategic goals.
- Customizing the LMS system which is selected so it is tailored to the needs of the Ministry of Education and complies with students and teachers visual and functional standards.
- Training the relevant staff within the Ministry of Education on how to operate the LMS.

Lot 2: Platform hosting and maintenance

- Hosting the LMS for a period of 3 years.
- Providing the relevant technical support to the Ministry of Education so it can manage this LMS platform.

Experience

Description of former experience with working on a similar project. Experience designing, launching, and managing a Learning Management Service. The Ministry of Education will rank the bids based on received information based on the level of detail, harmony with the objectives and based on international practices.

Learning Management Service development and management experience: Minimum experience 5 years.

Public sector customer experience: Minimum experience 3 years.

Experience with leading e-learning platforms. Minimum experience with 2 leading e-learning platforms.

Experience in developing online training.

Quality

Quality of technical offer and organization of service should include, but is not limited to:

- Description of how you plan to organize the LMS platform and features to meet set requirements and process.
- Overview of the core tasks/service packages and timeframe needed to fulfil the contract, the resourced planned to be utilized for each core tasks/service packages (number of hours to fulfill the tasks/service packages).

The Ministry of Education	[Company Name]
[Name of representative]	[Name of representative]
[Position of representative]	[Position of representative]

Adapted from the EIT Urban Mobility's Request for Proposals for Competence Hub's Learning Management System (2020).

4.9.10 Vendor Management

Vendor management will include regular monitoring of the contracts. The Project Officer is responsible for following up and ensuring that the actions of the supplier and the project team are in line with the contractual responsibilities, reflecting amendments to the contracts where applicable and ensuring any claim or disputes are resolved amicably according to the terms of the contract. Payment for goods or services will be the responsibility of the Project Manager but contract close out is the responsibility of the Project Officer.

When contracts are awarded, the Project Officer will monitor performance, collect information, and measure actual contract achievement. For small procurements a telephone call or email is satisfactory to ensure everything is according to plan. For more complex projects, reports, regular progress meetings, formal testing, and technical reviews must be done. For performance-

based contracts, performance indicators developed in the contract will be used. The Project Officer will maintain cost control, schedule control, compliance with terms and conditions, reporting requirements and administrative aspects of performance.

4.9.11 Performance Metrics for Procurement Activities

The following metrics will be used to measure vendor performance for this project's procurement activities:

1. Efficiency of the competitive process
2. Cost reduction/ containment
3. Supplier management
4. Efficiency of internal systems and processes
5. Product/Service Quality

The following metric table will be used to measure performance. The performance is rated on a 1-3 scale as indicated below:

Table 29 Procurement Performance Evaluation Template

Vendor	Product Quality	On Time Delivery	Documentation Quality	Development Costs	Development Time	Cost per Unit	Transactional Efficiency
Vendor #1							

Vendor #2							
1-Unsatisfactory 2-Acceptable 3-Exceptional							

4.9.12 Sponsor Acceptance

Approved by the Project Sponsor

_____ Date: _____

<Project Sponsor>

<Project Sponsor Title>

4.10. Stakeholder Management Plan

According to the PMBOK (2017), 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. The processes support the work of the project team to analyze stakeholder expectations, assess the degree to which they impact or are impacted by the project, and develop strategies to effectively engage stakeholders in support of project decisions and the planning and execution of the work of the project (p 359).

For this project, “The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System,” the key input process is the

Project charter, Communications Management Plan, Stakeholder engagement plan, Project documents such as Change log, Issue log and Requirements documentation. The tools and techniques for developing this plan are expert judgement, data gathering, data analysis and representation and meetings.

To effectively manage key project stakeholders a Stakeholder Engagement Plan is an important component of the Project Management Plan. Project Stakeholder Management includes the identification of stakeholders who can impact or be impacted by the project, analysis of these stakeholders' expectations and impact or be impacted by the project, analysis of these stakeholders' expectations and impact on the project, and the development of strategies to manage and monitor the participation and involvement in the project. Before the Stakeholder Management Plan was prepared, the Stakeholder Register was developed as part of the Identify Stakeholder Process as seen in the Table below. The following Stakeholders have been classified based on their position, power and interest using a Five tier system ranging from very low (1) to very high (5), in favor (+), against (-) and neutral (+/-).

Table 30 Project Stakeholder Register

Stakeholders	Main expectations	Position	Power	Interest	Communication Requirements	Engagement Strategy
Sponsor	Improvement of the Learning Management System Virtual Learning Platform for hybrid learning in the Bahamian School system	+	5	5	Email, telephone calls, reports, meetings	Keep Satisfied: Ensure that the sponsor requirements are carried out, any deviation is too communicated before proceeding.
Project Manager	The successful achievement of each project milestone and successful final project delivery by the agreed deadline and within budget. To effectively manage the team and other stakeholders.	+	4	5	Email, telephone calls, reports, meetings	Keep Satisfied: Ensure that the sponsor requirements are carried out, any deviation is too communicated before proceeding.
Management Team	Successful delivery of the project, on time. Skill development. Effective interaction among team members.	+	3	5	Email, telephone calls, reports, meetings	Keep Satisfied: The team must be made to feel that they are central to the project and not simply employees. Thus some sense of ownership is necessary.

Website Developer	To design, test, and deliver a successful project with as few technical issues as possible.	+	4	5	Email, telephone calls, reports, meetings	Manage Closely: Expected to carry out the technical aspect dealing with the system and its components therefore a watchful eye must be placed on the individual to ensure they are complying to the specifications.
Administrative Staff	Multiple resources that is accessible from one location containing real-time updates and ease of communication with the school administration, teachers, students and parents.	-	3	5	Email, telephone calls, reports, meetings	Manage Closely: Expected to carry out the technical aspect dealing with the system and its components therefore a watchful eye must be placed on the individual to ensure they are complying to the specifications.
Faculty	Multiple resources that is accessible from one location containing real-time updates and ease of communication with the school administration, teachers, students and parents.	+	3	5	Emails, brochures, meetings	Keep Satisfied: The team must be made to feel that they are central to the project and not simply employees. Thus some sense of ownership is necessary.
Students	Multiple resources that is accessible from one location	+/-	3	4	Emails, brochures, meetings	Monitor: The users of the LMS and thus their

	containing real-time updates and ease of communication with the school administration, teachers and other students.					requirements must be adhered to.
Parents	Multiple resources that is accessible from one location containing real-time updates and ease of communication with the school administration, teachers and other parents.	+/-	3	4	Email, questionnaires, reviews	Monitor: Their input is necessary through the process
Ministry of Education	Improvement in students' performance and examination results. Increase in availability of resources to students no matter where they are located, they would receive the same information. Ease of communication among students, teachers, parents and administration.	+	2	4	Social Media, websites	Manage closely: expected to carry out the task of building content, monitoring users to ensure they are complying with the specifications

The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System

STAKEHOLDER ENGAGEMENT PLAN

Nassau
The Bahamas

16 January 2023

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4.10.1 Purpose

The Stakeholder Engagement Plan is a component of the Project Management Plan that outlines the engagement strategies and actions required to communicate and involve key stakeholders in the execution of the project. Productive involvement of stakeholders in the execution of the

project. Productive involvement of stakeholders means considering the stakeholders' interests and expectations in the project, and the degree to which they can impact or be impacted by the project. The Stakeholder Engagement Plan outlines the strategies to effectively engage stakeholders with an objective to gain support of the project decisions for the successful execution of the project. This plan specifies the frequency and types of communication with key contact person. The plan was created as part of the Plan Stakeholder Engagement Process and will be updated frequently throughout the project as stakeholder communication needs change.

4.10.2 Identify Stakeholders

The first step of Project Stakeholder Management was completed prior to development of the Stakeholder Engagement Plan. This is the Identify Stakeholders process. This is the process of identifying project stakeholders regularly and analyzing and documenting relevant information regarding their interests, involvement, interdependencies, influence, and potential impact on success. The following Stakeholders have been identified and their power and influence has been classified using a Five tier system ranging from very low (1) to very high (5), in favor (+), against (-) and neutral (+/-).

Table 31 Stakeholder Interests

	Stakeholders	Interests
1	Sponsor	Improvement of the Learning Management System Virtual Learning Platform for hybrid learning in the Bahamian School system
2	Project Manager	The successful achievement of each project milestone

		and successful final project delivery by the agreed deadline and within budget. To effectively manage the team and other stakeholders.
3	Management Team	Successful delivery of the project, on time. Skill development. Effective interaction among team members.
4	Website Developer	To design, test, and deliver a successful project with as few technical issues as possible.
5	Administrative Staff	Multiple resources that is accessible from one location containing real-time updates and ease of communication with the school administration, teachers, students and parents.
6	Faculty	Multiple resources that is accessible from one location containing real-time updates and ease of communication with the school administration, teachers, students and parents.
7	Students	Multiple resources that is accessible from one location containing real-time updates and ease of communication with the school administration, teachers and other students.
8	Parents	Multiple resources that is accessible from one location containing real-time updates and ease of

		communication with the school administration, teachers and other parents.
9	Ministry of Education	Improvement in students' performance and examination results. Increase in availability of resources to students no matter where they are located, they would receive the same information. Ease of communication among students, teachers, parents and administration.

(Source: Author of Study)

4.10.2.1 Power/Interest Classification

This project assesses each stakeholder's position as well as their impact on the project and/or how they are impacted by the project. One purpose of this activity is to help identify and categorize stakeholders so that appropriate attention can be given to each according to the level of engagement needed. The process of developing approaches to involve project stakeholders based on their needs, expectations, interests, and potential impact on the project. The following Stakeholders have been classified based on their position, power and interest using a Five tier system ranging from very low (1) to very high (5), in favor (+), against (-) and neutral (+/-).

Table 32 Stakeholder Classification

Stakeholders	Position	Power	Interest
Sponsor	+	5	5

Project Manager	+	4	5
Management Team	+	3	5
Website Developer	+	4	5
Administrative Staff	-	3	5
Faculty	+	3	5
Students	+/-	3	4
Parents	+/-	3	4
Ministry of Education	+	2	4

(Source: Author of Study)

The Power/Interest grid, in the table below, will be used to categorize each stakeholder group to further establish stakeholders' level of interest or concern and their ability to influence the project outcomes.

Table 33 Stakeholder Power/Interest Grid

	High Impact Interest	Low Impact Interest
High Influence Power	Keep Satisfied Sponsor, Project Team	Manage Closely Web Administrator, Systems administrator, Instructional Lead

Low Influence Power	Monitor Students, Teachers, Ministry of Education	Keep Informed Community

(Source: Author of Study)

4.10.2.2 Stakeholder Interviews

To confirm that the Stakeholder Identification and Analysis process is accurate and complete, the project team, led by the Project Manager, will help facilitate a series of reviews. In addition, optional qualitative interviews may be performed for the Stakeholder Groups identified as most influential or most impacted by the project to validate that their issues and concerns have been captured accurately.

4.10.3 Plan Stakeholder Management

The Project Manager will be responsible for engaging stakeholders throughout the lifecycle of the project. The level of engagement required for each stakeholder may vary over the course of the project. Highly engaged key stakeholders in the early stages of the project are essential for project kickoff as it helps to achieve stakeholder buy-in and eliminate obstacles. As the project progresses, the level of engagement will shift from key stakeholders to the broader project team and end-users.

4.10.3.1 Stakeholder Engagement

A Stakeholder Engagement Assessment Matrix, as seen in the table below, is a useful tool to ensure the correct level of engagement is being achieved by each stakeholder. From the Stakeholder Register, each stakeholder was assessed in terms of their current and desired level of engagement. The assessment helps to ensure project success is achieved. The gap between

current and desire state for each stakeholder will direct the level of communication necessary to effectively engage the stakeholder.

Table 34 Stakeholder Engagement Assessment Matrix

Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
Sponsor				C	C
Project Manager				C	C
Project Team				C	
Students	C			D	
Teachers	C			D	
Web Administrator	C			D	
Systems Administrator	C			D	
Vendors	C			D	
Instructional Leader	C			D	

Stakeholder Engagement Assessment Matrix. List stakeholders and place a 'C' for their current level of engagement and 'D' in the column of their desired level of engagement.

The engagement level of the stakeholders can be classified as follows:

Unaware – Unaware of project and potential impacts.

Resistant – Aware of project and potential impacts and resistant to change.

Neutral – Aware of project yet neither supportive nor resistant. Supportive - Aware of project and potential impacts and supportive to change. Leading - Aware of project and potential impacts and actively engaged in ensuring the project is a success.

(Source: Author of Study)

4.10.4 Manage Stakeholder Engagement

The process of communicating and working with stakeholders to meet their needs and expectations, address issues, and foster appropriate stakeholder engagement involvement. The table below shows the method and the strategies involved in keeping the stakeholders engaged.

Table 35: Stakeholder communications Strategy

Method	Communication Method	Strategy
Sponsor	Email, telephone calls, reports, meetings	Keep Satisfied: Ensure that the sponsor requirements are carried out, any deviation is too communicated before proceeding.
Project Team	Email, telephone calls, reports,	Keep Satisfied: The team must be made

	meetings	to feel that they are central to the project and not simply employees. Thus, some sense of ownership is necessary.
LMS Administrator/Technical Team	Email, telephone calls, reports, meetings	Manage Closely: Expected to carry out the technical aspect dealing with the system and its components therefore a watchful eye must be placed on the individual to ensure they are complying to the specifications.
Website Developer	Email, telephone calls, reports, meetings	Manage Closely: Expected to carry out the technical

		aspect dealing with the system and its components therefore a watchful eye must be placed on the individual to ensure they are complying to the specifications.
Ministry of Education	Email, telephone calls, reports, meetings	Manage closely: expected to carry out the task of building content, monitoring users to ensure they are complying with the specifications
Students	Emails, brochures, meetings	Monitor: The users of the LMS and thus their requirements must be adhered to.
Teachers	Email,	Monitor: Their

	questionnaires, reviews	input is necessary through the process

(Source: Author of Study)

4.10.5 Approval

Approved by the Project Sponsor

_____ Date: _____

<Project Sponsor>

<Project Sponsor Title>

4.11. Sustainability Management Plan

The purpose of this document is to provide a framework for Project Sustainability by describing the approach, the roles and responsibilities, the budgeting, and the reporting practices. This Sustainability Management Plan (SMP) will show the support of the Ministry of Education's commitment to economic growth, environmental protection, and social accountability.

The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System

SUSTAINABILITY MANAGEMENT PLAN

Nassau
The Bahamas

16 January 2023

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4.11. Sustainability Management Plan

4.11.1 Purpose

The purpose of this document is to provide a framework for Project Sustainability by describing the approach, the roles and responsibilities, the budgeting, and the reporting practices. This Sustainability Management Plan (SMP) will show the support of the Ministry of Education's commitment to economic growth, environmental protection, and social accountability.

4.11.2 Approach

Planning for sustainability management will be done by completing this document.

Identifying sustainability impacts will include:

- A block of time during the Discovery Phase of the PRiSM Project Lifecycle for team members to work together to complete the P5™ Impact Assessment (P5IA) included in Section 7.
- Time will be reserved during the first team meeting of each month to focus on reviewing sustainability impacts.
- Key performance indicators (KPIs; see below) for relevant topics from P5 will be documented.

Responding to sustainability impacts will include:

- Implementing responses to all items with a high positive or negative impact score.
- Avoidance of unacceptable impacts.
- Keeping this Project Sustainability Management Plan current throughout the project.
- Inclusion of "sustainability impact updates" as an agenda item for each team meeting.
- Integrating sustainability risk and opportunity management with overall project risk and opportunity management.

4.11.3 Roles and Responsibilities

The Project Manager shall:

- Incorporate the resources and time required to execute the Sustainability Management Plan in the project budget and schedule.

- Develop, distribute, and implement this Sustainability Management Plan.
- Update the lessons learned database at the end of each project phase.
- Provide a report to the function or office that is responsible for sustainability reporting.
- Manage accountability for sustainability responsibilities.
- Delegating tasks to project team members.
- Conducting meetings with project team members, Sustainability Impact Owner and other stakeholders relating to project status updates and changes to the Sustainability Management Plan.

The Project Team shall:

- Identify sustainability impacts and describe them in the prescribed formats.
- Assess the impact of sustainability-related actions on project success criteria.
- Perform the impact response actions assigned.
- Generate and support the implementation of sustainability initiatives.

Sustainability Impact Owner responsibilities include:

- Develop and/or update the assigned risk response strategy.
- Monitor the risk assigned and inform the PM of any changes to probability or impact.
- Monitor the risk trigger and risk cues and inform the PM as appropriate.
- Monitor and report sustainability progress throughout project delivery.

4.11.4 Budget

The Budget for this project will include the following items related to project sustainability management:

Table 36 Sustainability Activity

Deliverable ID Number	Task Name	Sustainability activity budgeted
1.0	Systems Engineering	Promote local suppliers
	Project Initiation	Local supplier selection
1.1.	Collect Sponsor Requirements	
1.1.1	Meet with Sponsor	
1.1.2	Establish Project Requirements/Scope	Prepare designs for energy efficiency
	Project Defined	Verify sustainability criteria items are fulfilled
1.2	Market Research	Promote local suppliers
1.2.1	Conduct Market Survey	Local supplier selection
1.2.2	Collect Information	
1.2.3	Analyze Information	
1.2.4	Present Findings	
	Market Analysis Report	

1.3	Conduct Product Research	Promote local suppliers
1.3.1	Determine Software Requirements Specifications	Local supplier selection
1.3.2	Determine Hardware Requirements Specifications	Local supplier selection
1.3.3	Determine Security Requirements Specifications	Local supplier selection
	Hardware/Software/Security Requirements Established	Local supplier selection
1.4	Determine Business Definition Requirements	
1.4.1	Identify Key Stakeholders	
1.4.2	Conduct interviews/focus group sessions to capture Stakeholder requirements	
1.4.3	Categorize Requirements	
1.4.4	Interpret and Record Requirements	
	Business Requirements Report	
	Product Defined	
2.0	System Design	Promote local suppliers
2.1.1	Establish Software Requirements	Local supplier selection
2.1.2	Establish Hardware Requirements	
2.1.3	Establish Security Requirements	

	System design Completed	
2.2	User Interface Design	
2.2.1	Develop Information Architecture	
2.2.2	Design Graphical user interface	
2.2.3	Develop Mockup	
2.2.4	Develop Prototype	
	User interface design completed	
2.3	Website design	Promote local suppliers
2.3.1	Create blueprint	Local supplier selection
2.3.2	Develop Site map	
2.3.3	Sketch essential features	
2.3.4	Arrange visual elements	
	Website Design Completed	
2.4	Instructional Design	Promote local suppliers
2.4.1	Analyze requirements	Local supplier selection
2.4.2	Identify learners	
2.4.3	Develop learning objectives	
2.4.4	Determine Technology to be used	
	Instructional Design Completed	
2.5	Security Design	
2.5.1	Establish Protocols	

2.5.2	Establish Password entities	
	Security Concepts completed	
3.0	Build Phase	Promote local suppliers
3.1	Website build	Local supplier selection
3.1.1	Register Domain	
3.1.2	Create website	
3.1.3	Host website	
3.1.4	Upload Content	
	Website Development completed	
3.2	System/network build	Promote local suppliers
3.2.1	Create Network	Local supplier selection
	Network Completed	
4.0	Testing	
4.1	Quality Testing	Promote local suppliers.
4.1.1	User Acceptance testing	Local supplier selection
4.1.2	System testing	
4.1.3	Security testing	
	Launch Learning Management System	
5.0	Marketing	
5.1	Marketing Strategy	Promote local suppliers

5.1.1	Develop Marketing Strategy	Establish Sustainability Development goals criteria
5.1.2	Develop Marketing Plan	
	Marketing Plan Completed	
5.2	Marketing Collateral	
5.2.1	Source Advertising Packages	Promote local suppliers
5.2.2	Select Advertising Package	Local supplier selection
6.0	Implementation of Marketing Plan	
6.1	Project Management	
6.1.1	Planning	Verify sustainability goals and tasks are being performed as planned
6.1.2	Scheduling	Verify sustainability goals and tasks are being performed as planned
6.1.3	Execution	Verify sustainability goals and tasks are being performed as planned
6.1.4	Accounting	Verify sustainability goals and tasks are being performed as planned
6.1.5	Reporting	Verify sustainability goals

		and tasks are being performed as planned
6.1.6	Meetings	Verify sustainability goals and tasks are being performed as planned
	All relevant Project Plans Completed	Prepare lessons learned in sustainability items that were included

(Source: Author of Study)

4.11.5 Key Performance Indicators

Table 37 Key Performance Indicators

P5 Domain	Category	Key Performance Indicator
Product	Lifespan of product	The LMS will comply with the Ministry of Education of The Bahamas standards as well as International Standards.

	Servicing of product	Increase students' access to education by increasing access to material and their teachers. Increase in teachers' access to their students and providing more employment opportunities.
Process	Effectiveness of project processes	The procurement will favor companies who agree to perform the best quality work required with the most efficient sustainability cost.
	Efficiency of project processes	The procurement will favor companies which vow to

		perform the required work in the time stipulated or shorter.
	Fairness of project processes	Project procurement will favor companies with approved sustainability methodologies.
People	Labor practices and decent work	All activities of the project will be properly executed by the project team and deliverables are as planned. No discrimination will be made based on gender, race, age or nationality. Labor laws for The Bahamas will be

		kept.
	Society and customers	Local teachers, students and parents understand the project usefulness for the country and willingly offered their assistance.
	Ethical behavior	The best suppliers were selected. All procurement activities were followed based on international standards. Transparency was maintained in the financial and accounting procedures to ensure

		funds were being properly managed.
Planet	Transportation	Reduce transportation costs.
	Energy	Ensure that energy costs do not exceed what was budgeted. Ensure that energy consumption is minimized.
	Consumption	Ensure that all unwanted materials are recycled through local companies. Avoid unnecessary wastage of material where possible.
Prosperity	Business Case analysis	Generate investment opportunities though educational tourism

	Business agility	Project will have all environmental approvals
	Economic stimulation	Create 300 full time and part time jobs

(Source: Author of Study)

4.11.6 Potential Impact on Sustainability of Scope Exclusions

Private schools will not be a part of the analysis. There the impact of having such a system in the Bahamian Education System may not truly be felt as Private school students and teachers although similar, they may represent a different socioeconomic class which can result in different results seen using the LMS. The LMS is the only virtual platform concerned by the project and the project will be executed on improving only elements of this platform. There may be other platforms that could be better suited for this archipelagic nation, however by focusing on the one that is currently in place and making the improvements in the deficient areas is thought to have positive results. The project must be executed in 6 months. All upgrades to be added must comply with international education standards. Both the time frame of the project and the restrictions to complying with international standards create a greater possibility of seeing a better system soon that is on par with our northern neighbors.

4.11.7 Reviews and Reporting

Meetings for the purpose of discussing and making decisions on project sustainability will be held monthly with the relevant stakeholders. The initial sustainability management actions shall occur during the development of the initial project plan. A full review and update of the P5 Impact Analysis (P5IA, see Section 4.11.8 below) will occur at the beginning of each subsequent phase of the project.

The following forms will be used for documenting risk management activities:

- identification, evaluation, and risk mitigation.
- risk control monitoring,
- cost-benefit analysis,
- financial impacts.

4.11.8 Approval

Approved by the Project Sponsor

_____ Date: _____

<Project Sponsor>

<Project Sponsor Title>

5 CONCLUSIONS

Developing the project management plan along with its subsidiary plans for the proposed learning management system would assist in creating the final product in time, within budget and remain in scope. Without a proper plan project tend to either fail or not meet stakeholder requirements.

1. A true measure of success can be defined by the project charter and scope. The charter and project scope provide direction and a sense of purpose to the management of the project from start to finish. The project charter and scope developed for the Ministry of Education project were specific to what would be undertaken and what were the project exclusions.
2. Creating the Project Schedule Management Plan ensures that the project team completes the tasks within the appropriate time frame. Projects going outside the triple constraints, of which, time is one, lends itself to potential failure. Special attention was given to identifying the activities necessary for the project completion. They were sequenced giving clear indication of the predecessors – the tasks that need to be completed before another starts. A suitable project schedule ensures a certain level of order, and time and resource management during such a situation. This project duration was 6 months, from January to June 2023. A reduction in work time is due to 4 non-working days that are official public and bank holidays announced for 2023 in The Bahamas. This project shows that strict adherence to the schedule is then a critical component of the Ministry of Education project.
3. The Cost Management Plan establishes the baseline for what the project is expected to cost and outlines actions to ensure that the project is on budget. Cost management must

take an organized approach to balance cost with project activities. The Ministry of Education project's cost estimate is a total of USD $9,200. The 5% Contingency reserve of USD $500 and the 3% Management reserve of USD $300 will be covered by the Ministry of Education. The cost baseline curve and S-curve were also developed as part of the project cost deliverable so that strict cost supervision can be maintained.

4. To gain approval from stakeholders the final product must meet the predetermined quality standards. To achieve this, a quality management plan was structured from internationally accepted standards to suit the project. A set of principles were formulated as a mandate to follow to achieve the best quality product. Quality assurance procedures were factored in as a basis for measuring various components of the system. The final aspect of the plan was the control methods to adhere to ensure the quality of the product is kept to a high standard and stakeholder expectation.
5. The Human Resource Management Plan will determine the human resource aspect and will install the right people for the undertaking. Once the various positions were identified roles and responsibilities were assigned to each post. The skillset outlined was in congruence with the abilities necessary for the project. An organizational chart indicates to the project staff (external and internal) their levels of authority. Another imperative facet of the human resource management plan was the assignment of personnel to tasks using a RACI.
6. The Communications Management Plan allows for open and clear lines of communication between the project team and all stakeholders. Relevant, accurate and consistent information must be communicated to the appropriate audiences in a timely

manner. The Communications Matrix details the Ministry of Education's project communications requirements, communication medium and frequency of communication with stakeholders.

7. The Risk Management Plan contributed to the project success by identifying potential negative and positive risks. The objective is to alleviate the negative ones and take advantage of the positive. A risk register is a key element in this regard, that identifies all the possibilities, their causes, probabilities along with the responses. To achieve this a matrix of roles and responsibilities was created along with an RBS. The impact and probability scales were developed to prioritize the potential threats and opportunities.
8. A Procurement Management Plan was developed to identify the goods and services for the project, ensuring that appropriate contracts and contractual arrangements were defined. The evaluation, subsequent selection of vendors and protocols were based on the requirements set by the Ministry of Education.
9. A Stakeholder Management plan was developed to foster management strategies to engage all stakeholders. Stakeholder identification and management is paramount to establishing the basis for the LMS and gaining approval upon completion, Consequently, a stakeholder register was conceptualized detailing all the possible stakeholders positive or negative. This register will become a very significant project document that will be used to keep the stakeholders informed and updated. Classification of the stakeholders was done to rank each in terms of power and influence. An engagement assessment matrix determined the current and expected levels of stakeholder interaction with the system.

10. A Sustainability Management Plan was developed to provide a framework for Project Sustainability by describing the approach, the roles and responsibilities, the budgeting, and the reporting practices. This Sustainability Management Plan (SMP) will show the support of the Ministry of Education's commitment to economic growth, environmental protection, and social accountability.

6 RECOMMENDATIONS

The general objective of this project, “The Improvement in Virtual Learning Platforms Project such as Learning Management Systems (LMS) in The Bahamian School System,” was to develop a Project Management Plan for the Improvement of the learning Management System (LMS) Virtual learning platform in The Bahamian School System to implement hybrid learning. The following recommendations are directed to the Ministry of Education, the Project Sponsor.

1. It is recommended that good project management techniques should be followed when pursuing a project of any magnitude. Therefore, a project management plan and its subsidiary plans must be established to increase the project’s success,
2. Project costs can maintain stable costs if the progress of the project is tracked carefully over time. This is done through a well-developed Cost Management Plan that will keep the cost range inside the project cost constraint and increase the likelihood of the project’s success.
3. It is recommended that future projects have a Quality Management Plan to ensure all activities and tasks are done to maintain the desired level of excellence in relation to previously defined objectives. This is important as poor-quality products can have profound effects on the project, resulting in rework, schedule delays and higher costs.
4. A proper Resource Management Plan is necessary to ensure the resources necessary are available to complete the project successfully and are utilized appropriately. For this project, people with advanced skills in networking and web administration are key for this project’s success.
5. A proper Communications Management Plan is necessary to ensure open communication with all stakeholders for a project’s success. The project manager must therefore possess managerial skills to create an environment whereby the team works in unison and when issues or conflicts arise, they can be solved without placing the project in jeopardy.
6. A project is more likely to be successful if it has a well-developed Risk Management Plan to plan, identify, analyze, respond and monitor risks on the project. High level risks can be identified and mitigated.
7. A well-developed Procurement Management Plan is necessary to detail all the requirements necessary to acquire the necessary goods, works and services to complete the project successfully. It is important that the procurement method chosen is one that is best for the

project. This will reduce procurement risks and increase the likelihood of better-quality products and resources and remaining on budget.

8. A successful project of this magnitude requires a proper Stakeholder Management Plan to ensure all stakeholders are considered. This plan will ensure that all the key high-power stakeholders are properly categorized, and their needs are met.

9. A well-developed Schedule Management Plan is necessary for a project's success as it will ensure the timely completion of the project. This is particularly important for a project like this one with strict time constraints.

10. A proper Sustainability plan is necessary to develop and ensure sustainable objectives. Its purpose is to provide a framework for Project Sustainability by describing the approach, the roles and responsibilities, the budgeting, and the reporting practices. The Sustainability Management Plan (SMP) will show the support of the Ministry of Education's commitment to economic growth, environmental protection, and social accountability.

11. For future projects, The Ministry of Education should consider including the Private schools. Other virtual learning platforms should also be considered to find the best suited one for the school. Now that a framework is established, the Ministry of Education can consider adjusting the Project's timeline. However, all upgrades to be added must comply with international education standards.

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

A project management plan for the improvement of the learning management system (LMS) virtual learning platform in the Bahamian school system to implement hybrid learning will help provide quality education, a sustainable development goal.

The effects of the project execution, deliverables or effects of its maintenance and operation or result favor of the regenerative and sustainable design through its advantages. The advantages of Online learning/Hybrid learning are efficiency, accessibility of time and place, affordability, improved student attendance and tailored learning to a variety of learning styles.

Online learning offers teachers an efficient way to deliver lessons to students. Online learning has several tools such as videos, PDFs, podcasts, and teachers can use all these tools as part of their lesson plans. By extending the lesson plan beyond traditional textbooks to include online resources, teachers can become more efficient educators.

Another advantage of online education is that it allows students to attend classes from any location of their choice. It also allows schools to reach out to a more extensive network of students, instead of being restricted by geographical boundaries. Additionally, online lectures can be recorded, archived, and shared for future reference. This allows students to access the learning material at a time of their comfort. Thus, online learning offers students the accessibility of time and place in education.

Another advantage of online learning is reduced financial costs. Online education is far more affordable as compared to physical learning. This is because online learning eliminates the cost points of student transportation, student meals, and most importantly, real estate. Additionally, all the course or study materials are available online, thus creating a paperless learning environment which is more affordable, while also being beneficial to the environment.

Since online classes can be taken from home or location of choice, there are fewer chances of students missing out on lessons.

Every student has a different learning journey and a different learning style. Some students are visual learners, while some students prefer to learn through audio. Similarly, some students thrive in the classroom, and other students are solo learners who get distracted by large groups.

The Disadvantages of Online/Hybrid Learning include inability to focus on screens, technology issues, sense of isolation, teacher training and the amount of time spent in front of a screen.

For many students, one of the biggest challenges of online learning is the struggle with focusing on the screen for long periods of time. With online learning, there is also a greater chance for students to be easily distracted by social media or other sites. Therefore, it is imperative for the teachers to keep their online classes crisp, engaging, and interactive to help students stay focused on the lesson.

Another key challenge of online classes is internet connectivity. While internet penetration has grown in leaps and bounds over the past few years, in smaller cities and towns, a consistent connection with decent speed is a problem. Without a consistent internet connection for students or teachers, there can be a lack of continuity in learning for the child. This is detrimental to the education process.

Students can learn a lot from being in the company of their peers. However, in an online class, there are minimal physical interactions between students and teachers. This often results in a sense of isolation for the students. In this situation, it is imperative that the school allow for other forms of communication between the students, peers, and teachers. This can include online messages, emails and video conferencing that will allow for face-to-face interaction and reduce the sense of isolation.

Online learning requires teachers to have a basic understanding of using digital forms of learning. However, this is not the case always. Very often, teachers have a very basic understanding of technology. Sometimes, they don’t even have the necessary resources and tools to conduct online classes. To combat this, it is important for schools to invest in training teachers with the latest technology updates so that they can conduct their online classes seamlessly.

Many parents are concerned about the health hazards of having their children spend so many hours staring at a screen. This increase in screen time is one of the biggest concerns and disadvantages of online learning. Sometimes students also develop bad posture and other physical problems due to staying hunched in front of a screen (Gautam, 2021).

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APPENDICES

Appendix 1: FGP Charter

CHARTER OF THE PROPOSED
FINAL GRADUATION PROJECT (FGP)

1. Student name

Keysha Raquel Charles

2. FGP name

Project Management Plan for the Improvement in Virtual learning platforms project such as Learning Management System (LMS in The Bahamian School System

3. Application Area (Sector or activity)

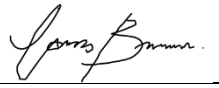
Education

4. Student signature

5. Name of the Graduation Seminar facilitator

Carlos Brenes Mena

6. Signature of the facilitator



7. Date of charter approval

February 26th , 2023

8. Project start and finish date

9 January 2023	30 June 2023

9. Research question

What changes can be made to the Virtual to improve students' attendance and performance?

10. Research hypothesis

Is it possible to improve the virtual platform (LMS) which might allow for an improvement in student attendance and performance in The Bahamas?

11. General objective

To develop a Project Management Plan for the Improvement of the learning Management System (LMS) Virtual learning platform in The Bahamian School System to implement hybrid learning.

12. Specific objectives

Specific objectives

1. To develop the Project Charter to ensure that all deliverables align cohesively.
2. To develop the Scope Management Plan in order to ensure that the project includes all the work required to complete the project successfully.
3. To develop the Cost Management Plan in order to keep the cost range inside the project cost constraint.
4. To develop the Quality Management Plan in order to ensure all activities and tasks are done to maintain the desired level of excellence in relation to previously defined objectives.
5. To develop the Resource Management Plan to ensure the resources necessary to complete the project successfully are utilized appropriately.
6. To develop the Communications Management Plan to ensure open communication with all stakeholders.
7. To develop the Risk Management Plan in order to plan, identify, analyze, respond and monitor risks on the project.
8. To develop the Procurement Management Plan in order to detail all the requirements necessary to acquire the necessary goods, works and services to complete the project successfully.
9. To develop the Stakeholder Management Plan to ensure all stakeholders are considered.
10. To develop the Schedule Management Plan to manage the timely completion of the project.
11. To develop a Sustainability plan to develop and ensure sustainable objectives.

13. FGP purpose or justification

The purpose of this project is to establish a project management plan that will improve the Learning Management System (LMS) in the Bahamian Education System. This project management plan will carry out a typical project life cycle, initiating, planning, monitoring and control and closing.

a. The current system is inadequate to maintain the heavy traffic as more people are better able to access the platform as demonstrated by the significant system crashes.

b. With a budget of over $1 million dollars each year in the education system the government has more than sufficient resources to ensure that the education it provides to the nation's youth is the best quality available, featuring the latest technology. This will help ensure that our students are able to meet international standards.

c. COVID-19 has demonstrated that the traditional ways of teaching and communicating have limits when faced with a pandemic that hinders face to face interactions. Blended learning not only ensures that measures are always in place when face to face learning is not possible, but it heightens the experience for all stakeholders and improve performances for all concerned.

Therefore, this project management plan will detail the procedures for a project manager to follow for the creation of this virtual learning system that will be completed within the allotted budget, time frame and with the intended scope.

14. FGP budget

Table 1: FGP Budget

Component	Cost (USD) $
System Engineering	1500
Designing	1000
Human Resource	2700
Testing	1000
Hardware/Software	2500

Marketing	500
Sub-Total	9,200
Contingency Reserve (5% of total)	500
Management Reserve (3% of total)	300
Total	10,000

(Source: Author of Study)

15. FGP planning and development assumptions.

1. Information about the learning management system (LMS) in The Bahamas is organized and available.
2. All government entities are ready to collaborate in signing all documents and contracts.
3. All the local stakeholders are ready to be involved in the project.
4. Researcher time for the FGP will be at least 10 hours per week during the FGP development process.

(Source: Author of Study)

16. FGP constraints

1. Private schools will not be a part of the analysis.
2. The LMS is the only virtual platform concerned by the project and the project will be executed on improving only elements of this platform.
3. The project must be executed in 6 months.
4. All upgrades to be added must comply with international education standards.

17. FGP development risks

1. A delay/fulfillment of government contributions might delay the project. 2. Lack of labor for project completion possibly due to lack of adequate compensation, COVID outbreaks and other health conditions. 3. The Bahamas' geographical location makes it prone to strong hurricanes. With a strong hurricane season there will be a delay in work due to disruption in power and internet resources that might delay the deliverables development. 4. Scope Creep may occur should additional funding be sought to complete portions of the project that may be placed on the back burner due to budget constraints. There is a possibility that new funders may have new ideas for what the project should look like.

18. FGP main milestones

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

Deliverable	**Finish estimated date**
1.1 FGP profile	
1.1.1 FGP Charter (Items 1 to 10) & Bibliographical Research	15 Jan 23
1.1.2 FGP Charter (Items 11 & 12) WBS	22 Jan 23
1.1.3 FGP Charter (Items 13 to19)	29 Jan 23
1.1.4 Chapter 2 Theoretical Framework & FGP Charter (Item 20)	5 Feb 23
1.1.5 Chapter 3 Methodological Framework & FGP Charter (Item 21)	12 Feb 23
1.1.6 Chapter 1 Introduction, Chapter 7 Project validation in the regenerative and sustainable development & Appendix 1 FGP Charter (item 22)	19 Feb 23
1.1.7 Executive summary, Abstract, Bibliographical references, indexes (contents, figures, charts) Signed FGP Charter	26 Feb 23
1.2 Graduation Seminar Approval	March 2023
2. Tutoring Process (lasts for 3 months)	13 March 2023
• 2.1 Tutor	

2.2 Adjustments of previous chapters (if needed)	
2.3 Chapter IV Development (Results) 1. To create the project charter in order to define the key input elements to develop the project management plan. 2. To develop the Scope Management Plan in order to ensure that the project includes all the work required to complete the project successfully. 3. To develop the Cost Management Plan in order to keep the cost range inside the project cost constraint. 4. To develop the Quality Management Plan in order to ensure all activities and tasks are done to maintain the desired level of excellence in relation to previously defined objectives. 5. To develop the Resource Management Plan to ensure the resources necessary to complete the project successfully are utilized appropriately. 6. To develop the Communications Management Plan to ensure open communication with all stakeholders. 7. To develop the Risk Management Plan in order to plan, identify, analyze, respond and monitor risks on the project. 8. To develop the Procurement Management Plan in order to detail all the requirements necessary to acquire the necessary goods, works and services to complete the project successfully. 9. To develop the Stakeholder Management Plan to ensure all stakeholders are considered. 10. To develop the Schedule Management Plan to manage the timely completion of the project. 12. To develop a Sustainability plan to develop and ensure sustainable objectives.	30 June 2023
2.4 Chapter V Conclusions	
2.5 Chapter VI Recommendations	
3. Reading by Reviewers	12 July 2023
3.1 Reviewers assignment request	
3.2 Reviewers work (lasts for about 10 working days)	
4. Adjustments (lasts for about 10 working days)	19 July 2023
4.1 Report for reviewers	
4.2 Update	

4.3 Second review by reviewers	30 July 2023
5. Defense to Board of Examiners (lasts approximately 5 working days)	August 2023
5.1 Final review by board	
5.2 FGP grade report	

19. Theoretical framework

19.1 Estate of the "matter"

The study disclosed that almost one half of the young people surveyed who were not attending classes regularly (47 percent) were unable to sign on to the Ministry's LMS or were experiencing chronic challenges. This statistic gave credibility to widespread feedback from teachers and students, many of whom expressed difficulty and frustration and this survey subsequently informed the rationale for renewed approach to the system. (McKenzie, 2022)."

With many of the findings from various studies repeating the results outlined in the previous paragraph, swift action must take place. The need for a project management for the improvement of the LMS in the Bahamian school system is critical to the students' improvement and academic success.

As an alternative, teachers have been creating work packages for students to pick up from the school and return when completed or delivered to the students themselves. This is not sustainable as it is taxing on the teachers as well as it does not allow for real time learning for the students if any learning occurs at all.

The best option is to improve the LMS for hybrid learning to take place.

19.2 Basic conceptual framework

Project management, LMS, Hybrid Learning

20. Methodological framework

Objective	Name of deliverable	Information sources	Research method	Tools	Restrictions
To create the project Integration Management Plan to	Project Charter	Primary: PMBOK Guide, discussion with the	Descriptive, analytical, quantitative, qualitative	Interviews, surveys and meetings	The final product must meet the user standards

ensure that all deliverables align cohesively.		stakeholders (teachers, students, school administrators) Secondary: Research data, Journals, Internet resources			
To develop the Scope Management Plan in order to ensure that the project includes all the work required to complete the project successfully.	Scope Management Plan	Primary: PMBOK Guide, discussion with the stakeholders (teachers, students, school administrators) Secondary: Research data, Journals, Internet resources	Descriptive, analytical,	Interviews, Surveys, Product analysis, WBS Generator software, Product review	The scope of the project must be adhered to without deviation.
To develop the Cost Management Plan in order to keep the cost range inside the project cost constraint.	Cost Management Plan	Primary: PMBOK Guide, Datasets Secondary: Research data, Journals, Internet resources	Descriptive, analytical, quantitative	Meetings, three-point estimating, project management software, cost aggregation	The project remains within the allotted budget

To develop the Quality Management Plan in order to ensure all activities and tasks are done to maintain the desired level of excellence in relation to previously defined objectives.	Quality Management Plan	Primary: PMBOK Guide, Internet resources Secondary: Journals	Quantitative, qualitative	Cost-benefit analysis, flow charts, inspection	The final product must meet the user standards
To develop the Resource Management Plan to ensure the resources necessary to complete the project successfully are utilized appropriately.	Resource Management Plan	Primary: PMBOK Guide, discussion with the stakeholders (teachers, students, school administrators) Secondary: Journals, Internet resources	Descriptive	Organizational charts	Resources may not be available when needed.
To develop the Communications Management Plan to ensure open communicat	Communications Management Plan	Primary: PMBOK Guide, Internet resources Secondary: Journals,	Analytical	Communication requirements analysis, communication technology, communication methods	Communication is dependent on a third party such as an internet service

ion with all stakeholders.		Internet resources			provider.
To develop the Risk Management Plan in order to plan, identify, analyze, respond and monitor risks on the project.	Risk Management Plan	Primary: PMBOK Guide, Internet resources Secondary: Journals, Internet resources	Descriptive, analytical, quantitative, qualitative	Meetings, brainstorming, cause and effect diagrams, SWOT analysis, risk probability and impact assessment, probability and impact matrix, risk categorization, strategies for negative risks or threats	Unforeseen risks are liable to develop as the project progresses.
To develop the Procurement Management Plan in order to detail all the requirements necessary to acquire the necessary goods, works and services to complete the project successfully.	Procurement Management Plan	Primary: PMBOK Guide, Internet resources Secondary: Journals, Internet resources	Descriptive, analytical	Market research, meetings, independent estimates	Goods and services are subject to external parties

To develop the Stakeholder Management Plan to ensure all stakeholders are considered.	Stakeholder Management Plan	Primary: PMBOK Guide, discussion with the stakeholders (teachers, students, school administrators) Secondary: Journals, Internet resources	Descriptive, analytical	Stakeholder analysis, meetings	Stakeholder requirements and level of interest may change during the project
To develop the Schedule Management Plan to manage the timely completion of the project.	Schedule Management Plan	Primary: PMBOK Guide Secondary: Research data, Journals, Internet resources	Descriptive, analytical, quantitative, qualitative	Meetings, Project Management software, critical path method	The project must be completed within the time scheduled
To develop a Sustainability plan to develop and ensure sustainable objectives.	Sustainability Management Plan	Primary: Sustainable Project Management: The GPM Reference Guide Secondary: Journals, Internet resources	Descriptive, analytical, quantitative, qualitative	Sustainable Project Management: The GPM Reference Guide tools	The project must be completed within sustainable guidelines.

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

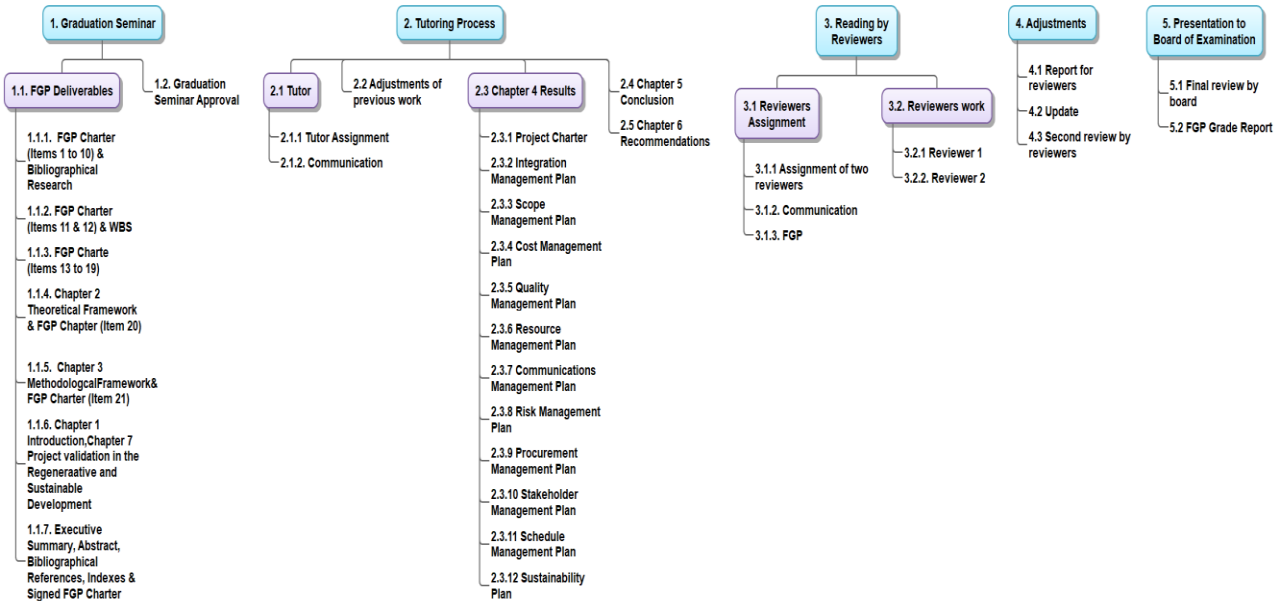
hybrid learning will help provide quality education, a sustainable development goal.

The effects of the project execution, deliverables or effects of its maintenance and operation or result favor of the regenerative and sustainable design through its advantages. The advantages of Online learning/Hybrid learning are efficiency, accessibility of time and place, affordability, improved student attendance and tailored learning to a variety of learning styles.

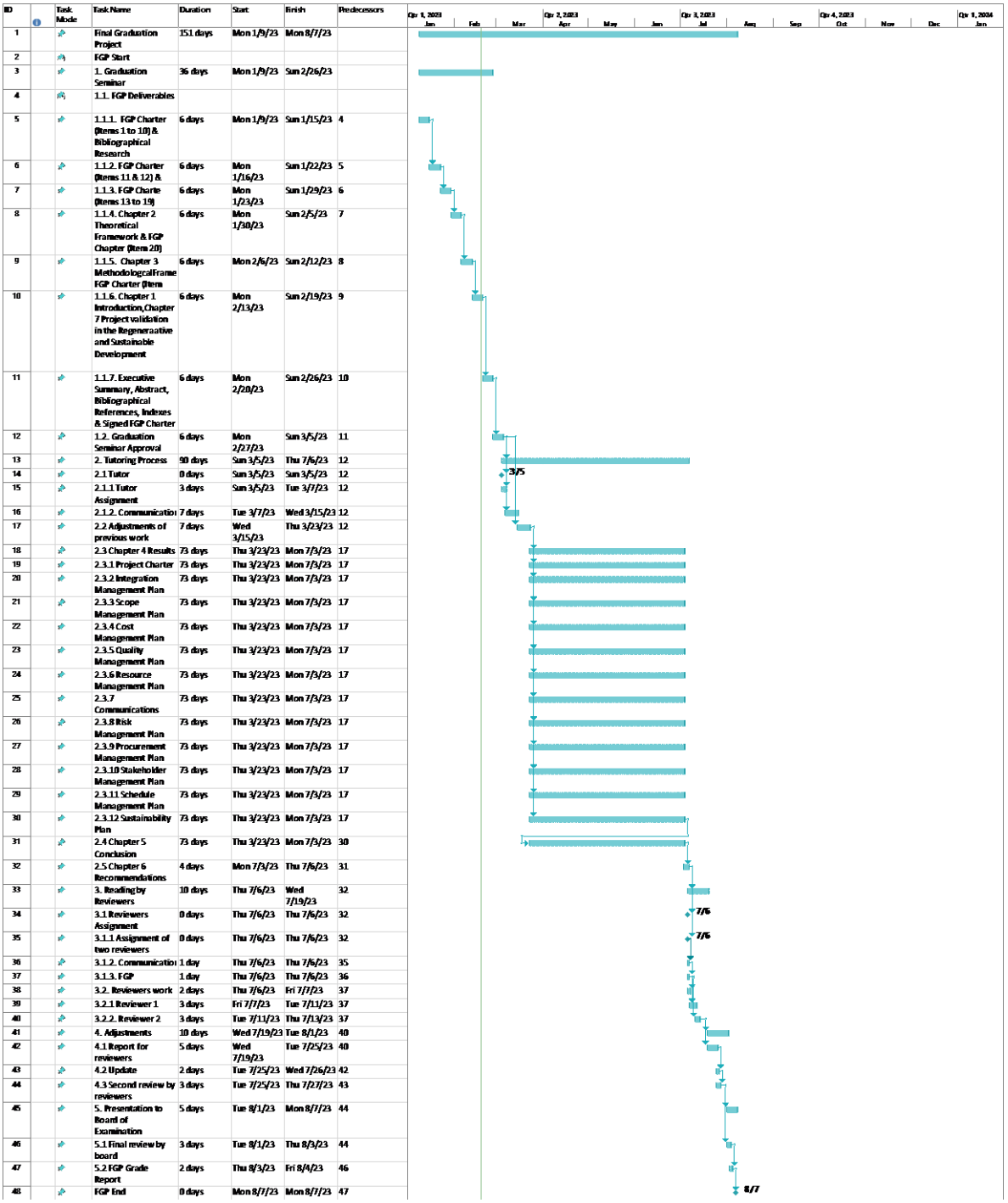
The Disadvantages of Online/Hybrid Learning include Inability to focus on screens, technology issues, sense of isolation, teacher training and the amount of time spent in front of a screen.

Appendix 2: FGP WBS

Table **2** Work Breakdown Structure



Appendix 3: FGP Schedule



ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		Final Graduation Project	151 days	Mon 1/9/23	Mon 8/7/23	
2		FGP Start				
3		1. Graduation Seminar	36 days	Mon 1/9/23	Sun 2/26/23	
4		1.1. FGP Deliverables				
5		1.1.1. FGP Charter (Items 1 to 10) & Bibliographical Research	6 days	Mon 1/9/23	Sun 1/15/23	4
6		1.1.2. FGP Charter (Items 11 & 12) &	6 days	Mon 1/16/23	Sun 1/22/23	5
7		1.1.3. FGP Charte (Items 13 to 19)	6 days	Mon 1/23/23	Sun 1/29/23	6
8		1.1.4. Chapter 2 Theoretical Framework & FGP Chapter (Item 20)	6 days	Mon 1/30/23	Sun 2/5/23	7
9		1.1.5. Chapter 3 MethodologcalFrame FGP Charter (Item	6 days	Mon 2/6/23	Sun 2/12/23	8
10		1.1.6. Chapter 1 Introduction,Chapter 7 Project validation in the Regeneraative and Sustainable Development	6 days	Mon 2/13/23	Sun 2/19/23	9
11		1.1.7. Executive Summary, Abstract, Bibliographical References, Indexes & Signed FGP Charter	6 days	Mon 2/20/23	Sun 2/26/23	10
12		1.2. Graduation Seminar Approval	6 days	Mon 2/27/23	Sun 3/5/23	11
13		2. Tutoring Process	90 days	Sun 3/5/23	Thu 7/6/23	12
14		2.1 Tutor	0 days	Sun 3/5/23	Sun 3/5/23	12
15		2.1.1 Tutor Assignment	3 days	Sun 3/5/23	Tue 3/7/23	12
16		2.1.2. Communication	7 days	Tue 3/7/23	Wed 3/15/23	12
17		2.2 Adjustments of previous work	7 days	Wed 3/15/23	Thu 3/23/23	12
18		2.3 Chapter 4 Results	73 days	Thu 3/23/23	Mon 7/3/23	17
19		2.3.1 Project Charter	73 days	Thu 3/23/23	Mon 7/3/23	17
20		2.3.2 Integration Management Plan	73 days	Thu 3/23/23	Mon 7/3/23	17
21		2.3.3 Scope Management Plan	73 days	Thu 3/23/23	Mon 7/3/23	17
22		2.3.4 Cost Management Plan	73 days	Thu 3/23/23	Mon 7/3/23	17
23		2.3.5 Quality Management Plan	73 days	Thu 3/23/23	Mon 7/3/23	17
24		2.3.6 Resource Management Plan	73 days	Thu 3/23/23	Mon 7/3/23	17
25		2.3.7 Communications	73 days	Thu 3/23/23	Mon 7/3/23	17
26		2.3.8 Risk Management Plan	73 days	Thu 3/23/23	Mon 7/3/23	17
27		2.3.9 Procurement Management Plan	73 days	Thu 3/23/23	Mon 7/3/23	17
28		2.3.10 Stakeholder Management Plan	73 days	Thu 3/23/23	Mon 7/3/23	17
29		2.3.11 Schedule Management Plan	73 days	Thu 3/23/23	Mon 7/3/23	17
30		2.3.12 Sustainability Plan	73 days	Thu 3/23/23	Mon 7/3/23	17
31		2.4 Chapter 5 Conclusion	73 days	Thu 3/23/23	Mon 7/3/23	30
32		2.5 Chapter 6 Recommendations	4 days	Mon 7/3/23	Thu 7/6/23	31
33		3. Reading by Reviewers	10 days	Thu 7/6/23	Wed 7/19/23	32
34		3.1 Reviewers Assignment	0 days	Thu 7/6/23	Thu 7/6/23	32
35		3.1.1 Assignment of two reviewers	0 days	Thu 7/6/23	Thu 7/6/23	32
36		3.1.2. Communication	1 day	Thu 7/6/23	Thu 7/6/23	35
37		3.1.3. FGP	1 day	Thu 7/6/23	Thu 7/6/23	36
38		3.2. Reviewers work	2 days	Thu 7/6/23	Fri 7/7/23	37
39		3.2.1 Reviewer 1	3 days	Fri 7/7/23	Tue 7/11/23	37
40		3.2.2. Reviewer 2	3 days	Tue 7/11/23	Thu 7/13/23	37
41		4. Adjustments	10 days	Wed 7/19/23	Tue 8/1/23	40
42		4.1 Report for reviewers	5 days	Wed 7/19/23	Tue 7/25/23	40
43		4.2 Update	2 days	Tue 7/25/23	Wed 7/26/23	42
44		4.3 Second review by reviewers	3 days	Tue 7/25/23	Thu 7/27/23	43
45		5. Presentation to Board of Examination	5 days	Tue 8/1/23	Mon 8/7/23	44
46		5.1 Final review by board	3 days	Tue 8/1/23	Thu 8/3/23	44
47		5.2 FGP Grade Report	2 days	Thu 8/3/23	Fri 8/4/23	46
48		FGP End	0 days	Mon 8/7/23	Mon 8/7/23	47

Appendix 4: Preliminary bibliographical research

1. Adeyeye, B., Ojih, S. E., Bello, D., Adesina, E., Yartey, D., Ben-Enukora, C., & Adeyeye, Q. (2022). Online learning platforms and covenant University students' academic performance in practical related courses during COVID-19 pandemic. Sustainability, 14(2), 878. https://doi.org/10.3390/su14020878

   This sources aids in providing support for the importance of virtual learning platforms after the last two years with the difficulties faced from the COVID-19 pandemic. Studies have shown that it would be in the best interest of the education system to invest more on online education platforms to maintain academic continuity, especially during times of emergency.

2. Alves, P., Miranda, L., & Morais, C. (2017). The influence of virtual learning environments in students' performance. Universal Journal of Educational Research, 5(3), 517-527. https://doi.org/10.13189/ujer.2017.050325

   This source further supports the claim that blended learning is an excellent tool to know students better and consequently, develop strategies which meet their interests and needs.

3. Felszeghy, S., Pasonen-Seppänen, S., Koskela, A., Nieminen, P., Härkönen, K., Paldanius, K. M., Gabbouj, S., Ketola, K., Hiltunen, M., Lundin, M., Haapaniemi, T., Sointu, E., Bauman, E. B., Gilbert, G. E., Morton, D., & Mahonen, A. (2019). Using online game-based platforms to improve student performance and engagement in histology teaching. BMC Medical Education, 19(1). https://doi.org/10.1186/s12909-019-1701-0

   The methods and results from this study can be applied to this region and The Bahamas that may or may not support the claim that the addition of virtual learning systems results in

learning gains, overall participation satisfaction and an increased motivation by the students to learn.

4. Jawad, K., Shah, M. A., & Tahir, M. (2022). Students' academic performance and engagement prediction in a virtual learning environment using random forest with data balancing. *Sustainability*, *14*(22), 14795. https://doi.org/10.3390/su142214795

   This learning makes the point that with the addition of the internet, learning can take place anywhere. The implementation of a better blended learning system provides access for a better quality communication interaction and resources.

5. Kliziene, I., Taujanskiene, G., Augustiniene, A., Simonaitiene, B., & Cibulskas, G. (2021). The impact of the virtual learning platform EDUKA on the academic performance of primary school children. *Sustainability*, *13*(4), 2268. https://doi.org/10.3390/su13042268

   This source underscores the argument that intensively integrating the virtual learning platform into formal education has had significant impact on students' performance which can be seen through another virtual learning platform.

6. Kolil, V. K., Muthupalani, S., & Achuthan, K. (2020). Virtual experimental platforms in chemistry laboratory education and its impact on experimental self-efficacy. *International Journal of Educational Technology in Higher Education*, *17*(1). https://doi.org/10.1186/s41239-020-00204-3

   This source helps in defining the key elements necessary for the virtual platforms to be a success. The platform allows students to practice self-efficacy by exposing them to activities where feedback is readily available when errors are made without the negative outcomes that

result from a lack of understanding which can result in enhanced performance over the course of learning.

7. Lee, B., Hsieh, S., Chang, Y., Tseng, F., Lin, Y., Chen, Y., Wang, S., Chang, Y., Ho, Y., Ni, Y., & Chang, S. (2020). A web-based virtual microscopy platform for improving academic performance in histology and pathology laboratory courses: A pilot study. Anatomical Sciences Education, 13(6), 743-758. https://doi.org/10.1002/ase.1940

   This source shows that virtual learning can be applied to the most complex subject in a school system while providing great assistance and improvement in students' performance and self-esteem.

8. Li, N., Wang, J., Zhang, X., & Sherwood, R. (2021). Investigation of face-to-face class attendance, virtual learning engagement and academic performance in a blended learning environment. *International Journal of Information and Education Technology*, *11*(3), 112-118. https://doi.org/10.18178/ijiet.2021.11.3.1498

   This source provides feedback from the actual users of the plaform, that is the teachers and students agree that blended learning enhances learning and performance and can be applied across most disciplines.

9. Rivas, A., González-Briones, A., Hernández, G., Prieto, J., & Chamoso, P. (2021). Artificial neural network analysis of the academic performance of students in virtual learning environments. *Neurocomputing*, *423*, 713-720. https://doi.org/10.1016/j.neucom.2020.02.125

This source shows that this type of environment makes it possible to reach more students when it is impossible to meet physically for a variety of reasons such as capacity or weather, it provides access to teaching resources and makes it easier to monitor the activity of the teaching staff and of the interactions between students and teachers. Furthermore, online environments make it possible to assess the factors that cause the students' academic performance to increase or decrease.

10. Zamri, N., Omar, N. B., Khair Anwar, I. S., & Mohd Fatzel, F. H. (2021). Factors affecting students' satisfaction and academic performance in open & Distance learning (ODL). International Journal of Academic Research in Business and Social Sciences, 11(11). https://doi.org/10.6007/ijarbss/v11-i11/11194

This source will provide insight on how the implementation of virtual learning systems can improve students satisfaction and academic performance due to its flexibility. It shows how students are be better equipped to function academically should another pandemic hit or simply thrive under normal circumstances because adequate help is readily available.

Appendix 5: Revision Dictum

30 June 2023

Academic Advisor

Masters Degree in Project Management (MPM)

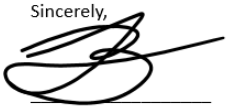
Universidad para la Cooperacion International (UCI)

Dear Academic Advisor,

Re: Philological Review of Final Graduation Project submitted by Keysha Raquel Charles in partial fulfillment of the requirements for the Masters in Project Management Degree

I hereby confirm that **Keysha Raquel Charles** has made all the required corrections and improvements suggested to the Final Graduation Project document as I have recommended. In my judgement, the document meets the literary and linguistic standards required for a student reading for a degree at the Masters level.

Sincerely,



Tarintina N. Brooks-Mills

Appendix 6: Philologist Credentials