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COLLEGE OF COMPUTER STUDIES
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GC LAMP: GORDON COLLEGE LEARNERS' ACADEMIC MANAGEMENT PORTAL

A Thesis

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ABSTRACT

Technology has become a vital component of our lives. This situation in education sector is inevitable. The COVID-19 pandemic have changed the ways of teaching and learning in educational institutions. The transition of traditional face-to-face classes to virtual classes raised issues and drawbacks for most institutions. The “GC LAMP” was developed in response to the implementation of distance learning for the educators to continue delivering quality education outside classroom and for the students to have unlimited access to learning resources anytime and anywhere. GC LAMP has gamification features that will motivate students to interact and collaborate with their instructors. Students and faculty members can also share knowledge or browse ideas and insights to a certain topic with the Forum feature, empowering student engagement with their peers and instructors. The News feature of GC LAMP provides curated and reliable information, announcement and updates of the institution. The methodology used in developing the application is Agile Methodology. An Agile approach is achieved by delivering small and useful updates in a timely and consistent manner, hence, improvements to the application are easy to implement. The ISO 25010 Software Evaluation for Faculty Panel got an average of 4.06, interpreted as Very Good, while the Student Panel has an average of 3.52, interpreted as Very Good as well.

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To the Gordon College Faculty and Students, for giving the opportunity to make a learning management system for the institution.

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Last but not the least, to the one above all, the omnipresent God, for answering prayers and giving the courage to carry on despite the desire to give up.

DEDICATION

This project is dedicated to the proponent's parents, who have never neglected to provide financial and moral support, for providing all the needs while the project is being developed, and for reminding that even the most difficult task can be completed if taken one step at a time. This thesis is dedicated to our Project Adviser, Mr. Melner Balce, CCS Faculty member, and to the Dean, Dr. Erlinda Abarintos, this project could not have been completed this without their ongoing guidance and advice. This Capstone Project is dedicated to all of the Gordon College staff who work so tirelessly just to provide quality education and the Gordon College students for their support to the project.

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CHAPTER I

THE PROBLEM AND ITS BACKGROUND

INTRODUCTION

Over the past years, the potential application of computers has expanded. The expansion of broadband internet access contributed in this evolution, either for personal or professional use. This evolution altered the importance of the technology in everyday life.¹ Many institutions have sought to enhance educational productivity and to enrich the instructional process by the introduction of technology. The many programs in computer-assisted instruction have been based on recognition of the unique value of the computer. A major computer-based system provides a whole new capability for testing, evaluating, and model building.² As e-learning becomes more prominent in higher education, the educational challenge of online facilitation grows in tandem with the advancement of exciting e-learning technologies. The functionality of the learning management system is being expanded in coordination with evolving computer communication technologies such as voice and video streaming.³ A learning management system (LMS) is used to prepare, execute, and evaluate a learning process. It typically allows a teacher to develop and distribute content, track student engagement, and assess student performance online.⁴

Many Malaysian institutions of higher learning also uses LMS in distributed learning, which includes the use of various information technologies to assist students in learning. The LMS has been enlisted as the distribution

[1] Beauvisage, T. (2009, April). Computer usage in daily life. In Proceedings of the SIGCHI conference on Human Factors in Computing Systems (pp. 575-584).

[2] Alpert, D., & Bitzer, D. L. (1970). Advances in computer-based education. *Science*, 167(3925), 1582-1590.

[3] Ely, D. P. (1990). Conditions that facilitate the implementation of educational technology innovations. *Journal of research on computing in education*, 23(2), 298-305.

[4] Rubin, B., Fernandes, R., Avgerinou, M. D., & Moore, J. (2010). The effect of learning management systems on student and faculty outcomes. *The internet and higher education*, 13(1-2), 82-83.

tool, which may include course expansion, blended learning, and virtual classrooms. Learning distribution that involves using various information technologies to help students learn. These learning materials can also be made available to other faculty for use in other classes, increasing their utility as teaching resources.⁵

In the Philippines, the e-learning environment is still in its development. Nonetheless, it has already been embraced and is being driven by prestigious institutions such as,⁶ the University of the Philippines Open University (UPOU), it has deployed its courses using online course management systems. In response to the UPOU system's advocacy for the use of free and open source software, it began with the commercial Integrated Virtual Learning Environment (IVLE) and then went on to Moodle (Modular Object-Oriented Dynamic Learning Environment).⁷ The University of Sto. Tomas has e-Learning Access Program (eLeAP), one of the core aspects of respondent-university education in which both students and facilitators has given a forum to communicate while accessing, exchanging, or distributing learning materials.⁸

This study intends to develop an online learning management system for the administration, faculty and students of Gordon College. This system will serve as a medium for monitoring students and distribution of information and learning materials that can be accessed anywhere. It has the potential to improve the quality of the distance learning mode of teaching, as well as the institution's ability to deliver quality education without jeopardizing health

[5] Alias, N. A., & Zainuddin, A. M. (2005). Innovation for better teaching and learning: Adopting the learning management system. *Malaysian online journal of instructional technology*, 2(2), 27-40.

[6] Garcia, M. B. (2017). E-learning technology adoption in the Philippines: an investigation of factors affecting filipino college students' acceptance of learning management systems. *The International Journal of E-Learning and Educational Technologies in the Digital Media*, 3(3), 118-130.

[7] Al Francis, D. L. (2012). Augmenting the learning management system of UP Open University. *Asian Association of Open Universities Journal*.

[8] Andalecio, A. B. P., Ferrera, E. I. V., Martinez, M. G. A., Singayan, S. I. A., & Tamag, G. R. D. (2020, April). An Assessment of an Online Learning Program of Hospitality College in a Private University. In *Journal of Physics: Conference Series* (Vol. 1529, No. 3, p. 032065). IOP Publishing.

conditions in facing the new normal brought on by the Covid-19 pandemic.

CONCEPTUAL FRAMEWORK

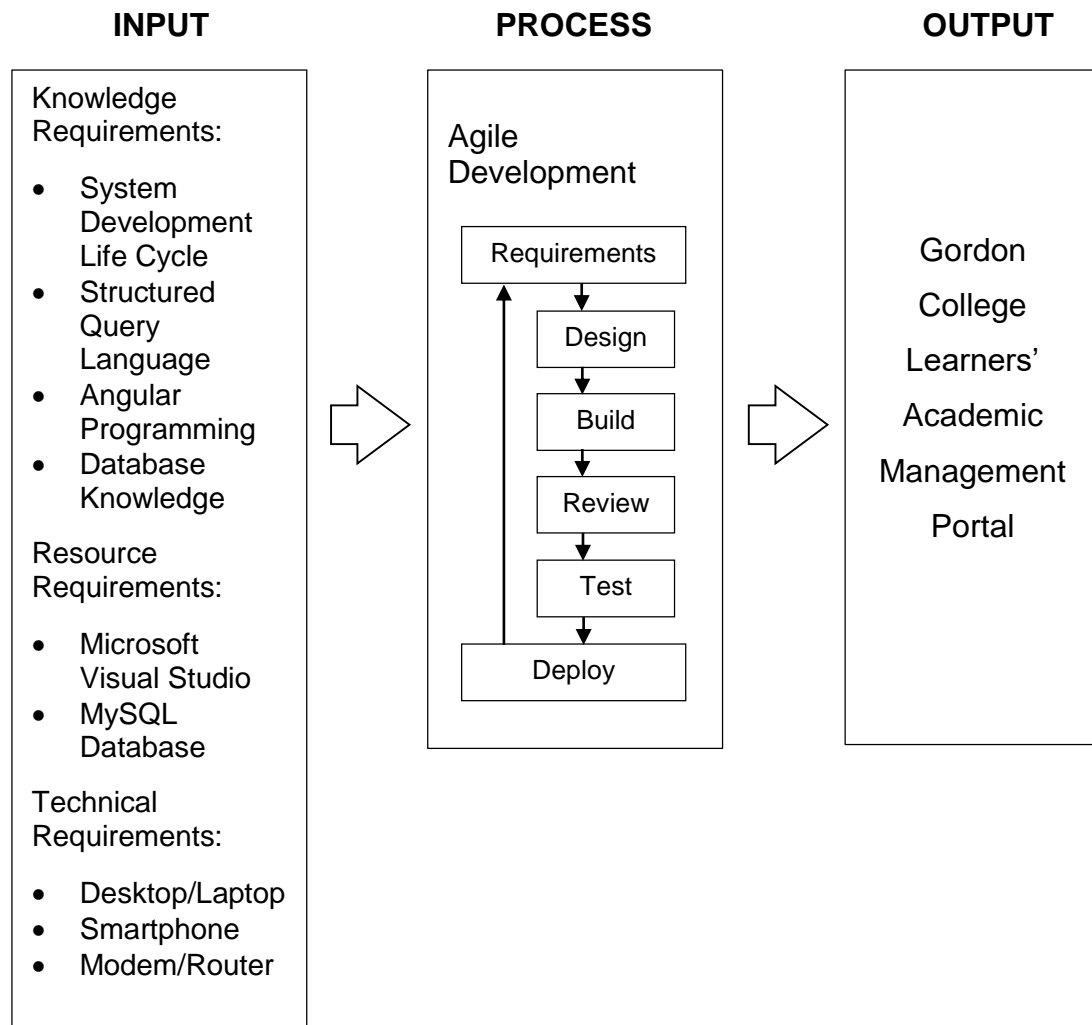


Figure 1. Conceptual Framework of the study.

The input is consisting of knowledge, resource and technical requirements to develop the proposed system. An Agile approach is used to develop the proposed system. Agile is a lightweight software development method. The most essential factor in this model is customer satisfaction, which is achieved by delivering small and useful updates in a timely and

consistent manner, hence, improvements to the application are easy to implement.⁹ Gordon College Learners' Academic Management Portal is the output of the study.

STATEMENT OF THE PROBLEM

This study aims to develop a learning management system for Gordon College to address the challenged of distance learning. It aims to enable users to access the LMS on any various devices, as well as to provide a centralized repository of academic content in different formats that users can access and share. The implementation of distance learning raised many shortcomings in conducting remote classes and in the distribution of student's learning materials.

Specifically, this study sought to give aid to the following problems:

- a) Expensive subscription to commercial LMS.
- b) Limited features of free and open source LMS.
- c) The struggle of distributing learning materials.
- d) Monitoring student's academic performance on remote teaching.

HYPOTHESIS

H0. There is a significant impact on the implementation of Gordon College Learners' Academic Management Portal to the academic performance of the students and academic management of the Faculty of Gordon College

[9] McCormick, M. (2012). Waterfall vs. Agile methodology. MPCs, N/A.

H1. There is no significant impact on the implementation of Gordon College Learners' Academic Management Portal to the academic performance of the students and academic management of the Faculty of Gordon College

BASIC ASSUMPTION

Health and safety has a major impact on the academic achievement of students.

The environment of the students affects the way they cope with their academic performance.

SCOPE AND DELIMITATION

The target users of the study are the administration, faculty and the Senior High School and College students who are currently enrolled in Gordon College. This study focus on the development and implementation of the Gordon College Learners' Academic Management Portal to be used as Gordon College's tool to supplement distance learning wherein the teachers and students will be capable of managing learning more effectively and thus reduce costs while also creating greater visibility for learning opportunities. The study intends to include all of the features that commercial LMSs offer, such as:

- Course and Content Administration
- Class/User Management
- Submission and Evaluation of Course Deliverables
- Push Notification

- Multimedia support
- Mobile App version for Student Portal
- Gamification
- Data Security

The Gordon College faculty and school administrators only will have the authority to manage their classes. This study does not cover issues such as:

- Power Outage
- Co-teaching Feature
- Internet Access
- Expenses on network data

SIGNIFICANCE OF THE STUDY

This study will give significance and importance to Gordon College Learners' Academic Management Portal that will allow students and faculty of Gordon College to reach, connect and interact with each other by the use of this application.

Proponents

This study has expanded their learning and experiences by brainstorming ideas to build the application. The proponents used the skills they have acquired over time and thereby learned more while developing the application.

Institution

This system will be used as a powerful platform of Gordon College that will allow the creation and efficient management of content and subjects in a simple and intuitive way.

Faculty

This system can help the Faculty and educators to easily manage their classes even without meeting face to face and lessen the work and effort of distributing learning materials.

Students

This system can help the students build connections with peers for learning purposes, share opinions, and collaborate on different topics. They can also keep themselves posted on the latest updates and announcements from the College Deans and Administrators of the institution.

Future Researchers

This study will serve as a guideline for the future projects in relation to the development of Gordon College Learners' Academic Management Portal.

DEFINITION OF TERMS

The following terms are defined conceptually and operationally for the better understanding of the readers.

Broadband Internet - The most common mode of internet access with a high data transfer rate.

E-learning - A form of learning that occurs electronically, most often via the Internet. It requires the use of electronic devices such as laptops, tablets, and smartphones with Wi-Fi or data connection to have access.

Learning Management System – a software application or web-based technology used to facilitate e-learning. It allows an instructor to develop and produce content, track student engagement, and evaluate student progress. Students will also be able to use interactive features such as threaded conversations and discussion boards.

Virtual Classroom - A teaching and learning environment that simulates the characteristics of traditional classroom. Teachers and students can interact in real-time online classes, chat with one another, hold discussions, and watch videos or presentations even they are geographically separated.

Computer-Assisted Instruction (CAI) - An instructional activity that uses a computer as the primary tool for presenting content, measuring progress, and guiding activities rather than one-to-one interaction with a student.

Integrated Virtual Learning Environment (IVLE) – A web-based courseware management that enables students and teachers to interact and collaborate over the Internet.

Moodle (Modular Object-Oriented Dynamic Learning Environment) - a user-friendly Learning Management System (LMS) that provides an open source, free and robust platform to deliver learning environment.

Academic Performance - An assessment of how well students performed on activities assigned to them such as essays, exam and quizzes based on certain academic standards developed by educators which

determines their rating in terms of the educational qualifications that they have accomplished.

Distance Learning - Distance learning is a form of education that takes place online. The internet is used to deliver lectures and learning materials. Students study at home rather than in a classroom.

CHAPTER II

REVIEW OF RELATED LITERATURE

This chapter includes a compilation of related topics and studies that are relevant to learning management system.

Foreign Related Studies

A. Edmodo

Jeff O'Hara and Nick Borg created Edmodo in 2008 as a free and secure learning site for teachers, students, parents, colleges, and districts. The website allows teachers and students in a virtual class to easily communicate and collaborate. Students can exchange material, send homework, assignments, and quizzes, receive reviews, notes, and updates from teachers, and vote in polls. Edmodo was named one of the top 25 librarian websites by the American Association of School Librarians in 2011. Edmodo has over 6.5 million users and hosts online conferences with tens of thousands of participants.¹⁰

Face-to-face student discussions are difficult to moderate for a single instructor since it is hard to listen to more than one party at a time and difficult to assess which students are actively involved in the discussion. The use of Edmodo's asynchronous discussion feature renders individual contributions visible to the instructor while also learning typing and communication skills.¹¹

[10] KBalasubramanian, K., Jaykumar, V., & Fukey, L. N. (2014). A study on "Student preference towards the use of Edmodo as a learning platform to create responsible learning environment". *Procedia-Social and Behavioral Sciences*, 144, 416-422.

[11] Holland, C., & Muilenburg, L. (2011, March). Supporting student collaboration: Edmodo in the classroom. In *Society for Information Technology & Teacher Education International Conference* (pp. 3232-3236). Association for the Advancement of Computing in Education (AACE).

B. Schoology

Schoology is a platform for online learning, classroom management, and social networking. It aims to enhance learning by improving communication, teamwork, and increasing access to education. Innovative methods and resources on the Schoology website assist teachers, students, and parents in developing a collaborative learning environment. Schoology fosters close collaboration between educational institutions and technology developers, making way to improve teaching and educational effectiveness at all levels of every setting.

Technology-enhanced learning process will help students learn more and practice what they've learned intuitively. According to Egbert (2009), teachers could guide students in making successful use of technology in the classroom in order to create something revolutionary. This knowledge will encourage students to engage in more meaningful thought and decision making.¹²

C. Google Classroom

Google Classroom is highly recognized as one of the most effective tools for improving teachers' efficiency. It was designed to assist teachers in managing the development and selection of student assignments in a digital repository, using the application of Google Docs, Drive, and other Apps. The option to add more than one instructor, as well as prepare for classes in advance, is part of the new features. Teachers will spend more time with their students and less time on paperwork with Google Classroom.¹³

[12] Biswas, S. (2013). Schoology-supported classroom management: A curriculum review. *Northwest Journal of Teacher Education*, 11(2), 12.

[13] Iftakhar, S. (2016). Google classroom: what works and how. *Journal of Education and Social Sciences*, 3(1), 12-18.

In the sense of incorporating Google Classroom into the teaching and learning of data mining and related application concepts, users (teachers or students) agree that Google Classroom is useful in assisting in the teaching and learning process, and because of its ease of use, they may intend to use it when the need arises.

Google Classroom is a productivity program that is part of the online Google Apps for Education suite. This program is free to download, but it must be set up at the level of educational institutions. Although GAFE contains many common Google applications that can be accessed by anyone, such as Gmail, Google Calendar, and Google Drive, Google Classroom is only available at GAFE. It serves as a central location for interacting with students, providing input, and assigning homework. Google Classroom's key strengths include time-saving and organizational features.¹⁴

Local Related Studies

A. University of the Philippines Open University (UPOU)

For the past eighteen years, the University of the Philippines Open University (UPOU) has been in operation. UPOU aspires to be a regional and national pioneer in open and distance e-learning (ODEL). Its goal is to provide Filipinos and other lifelong learners worldwide with access to high-quality tertiary education through revolutionary teaching and learning methods that are sensitive to their needs as well as the country's and the global community's development priorities.

[14] Shaharanee, I. N. M., Jamil, J. M., & Rodzi, S. S. M. (2016, August). Google classroom as a tool for active learning. In AIP Conference Proceedings (Vol. 1761, No. 1, p. 020069). AIP Publishing LLC.

Despite UPOU's groundbreaking transformation into the country's pioneer and leader in open and distance e-learning graduate university, it is still far from becoming an OU in terms of admissions, curricular offerings. UPOU, on the other hand, demonstrates transparency in offering Distance Education content, pedagogy, and management on a smaller scale than its counterparts around the world. This condition will endure as long as UPOU remains an open university within a typical university structure. This complex nature can be approached incrementally (Status Quo) or may necessitate transformative approaches.¹⁵

B. E-Learning Management System with Screen Share Technology

Thompson Christian School with an E-Learning Management System with Screen Share Technology caters to the needs of the students by providing course materials, taking examinations/quizzes online, and providing screen share during discussions. Throughout the analysis, the Web Engineering process model was used. To be able to recommend an alternative for the betterment of the company, interviews and observations on the company were conducted in order to assess the existing method. The E-Learning Management System with Screen Share Technology ensures that students receive a high-quality education as well as that teachers set a high quality education. Modules are provided and are extremely beneficial to both students and teachers. This system's architecture had been influenced by a variety of processes and circumstances. The

[15] Villamejor-Mendoza, M. (2013). The openness of the University of the Philippines Open University: Issues and prospects. *Open Praxis*, 5(2), 135-150.

framework ensures that the school's benefits conform to quality expectations and quality assurance. In favor of this, the organization invest in a faster internet connection and appoint someone to manage or monitor the system for errors over time to ensure quality satisfaction.¹⁶

[16] Dumanig, J. M. M., Fabio, B. J. L., Ibañez, M. J. C., & Rendon, H. M. V. (2013). E-Learning Management System with Screen Share Technology. *Cloud*, 1, 32-32.

CHAPTER III

TECHNICAL BACKGROUND

This chapter discusses the technical background of the study including the software application used during the development of this study.

A. Hardware Used

The proponents will discuss different hardware used in developing the web and mobile application.

Computer

A computer is an electronic machine that collects and processes the data. Most computers use a binary scheme, which uses two variables, 0 and 1, to perform tasks such as data storage, algorithm calculation, and information display. Computers come in a variety of shapes and sizes, ranging from handheld devices to supercomputers weighing more than 300 tons. The first computers were mainly used for numerical computations. Computers can answer difficult questions. They are inexpensive enough to be used in daily appliances.¹⁷

Smartphone

A smartphone is a portable device with a display screen, commonly a liquid crystal display, or LCD. Smartphones has an operating system (OS) that allows other software or application to be installed to manage information and integrated programs.¹⁸

B. Integrated Development

The proponents will discuss different software suite that consolidates tools required to write, modify and test software.

[17] Swaine, M. R. , Freiberger, . Paul A. , Pottenger, . William Morton and Hemmendinger, . David (2020, September 22). Computer. Encyclopedia Britannica. <https://www.britannica.com/technology/computer>

[18] Hosch, W. L. (2020, March 11). Smartphone. Encyclopedia Britannica. <https://www.britannica.com/technology/smartphone>

Visual Studio Code

The proponents used Visual Studio Code to build, develop and debug the application. Visual Studio code is a free yet powerful and lightweight source code editor developed by Microsoft for Windows, MacOS, and Linux that runs on desktop. It includes built-in support for JavaScript, TypeScript, and Node.js, as well as a robust ecosystem of extensions for other languages, including C++, C#, Java, Python, PHP, and Go.¹⁹

Google Chrome

Google Chrome is an Internet browser that was launched in 2008 by Google, Inc., a major American search engine corporation. By 2013, Chrome had surpassed both Microsoft's Internet Explorer and Mozilla's Firefox in popularity. Chrome is based on the open-source code of the Chromium project, but Chrome is not open-source. On September 2, 2008, the first beta version of Chrome was released for PCs running different versions of Microsoft Corporation's Windows OS (operating system).²⁰

Postman

The Proponents have developed, shared, tested and document APIs using the Postman API client. This is accomplished by allowing users to build and save simple and complex HTTP/s requests, as well as read the responses to those requests. Postman is a free API development collaboration tool. APIs allow any two different applications to transfer and share data with one another. Postman makes it easier for users to perform actions without needing to use the application's graphical user interface. It is a simple way to implement and evaluate the features in the app.²¹

[19] Microsoft. (2016, April 14). Documentation for Visual Studio Code. Retrieved April 14, 2021, from <https://code.visualstudio.com/docs>

[20] Hosch, W. L. (n.d.). Chrome | Description, Features, & Facts. Retrieved April 14, 2021, from <https://www.britannica.com/technology/Chrome>

[21] API Documentation Tool. (n.d.). Retrieved April 14, 2021, from <https://www.postman.com/api-documentation-tool/#:%7E:text=Postman%20allows%20you%20to%20publish,the%20rest%20of%20the%20world.>

MySQL

The proponents used MySQL software to add, access, and process data in the application. MySQL is an open source, anyone can download the software from the Internet and use it for free. MySQL Server was originally developed to handle large databases much faster than existing solutions and has been successfully used in highly demanding production environments for several years. Although under constant development, MySQL Server today offers a rich and useful set of functions. Its connectivity, speed, and security make MySQL Server highly suited for accessing databases on the Internet.²²

C. Webhosting Service

A web hosting service is a kind of Internet hosting service that enables organizations and individuals to render their websites available through the World Wide Web. The proponents used the web hosting service by Hivelocity, which provides Dedicated Servers, Colocation and Cloud Hosting services to customers from over 130 countries since 2002. Hivelocity operates over 70,000 sq. ft. of data center space offering services in Tampa FL, Miami FL, Atlanta GA, New York NY, and Los Angeles CA. Hivelocity was founded in 2002 with a mission: to build an outstanding company that focuses solely on hosting.²³

D. Frameworks

The proponents will discuss the frameworks used to build and manage web application, web services and websites.

[22] MySQL :: MySQL 8.0 Reference Manual :: 1.2.1 What is MySQL? (n.d.). MySQL 8.0 Reference Manual. Retrieved April 13, 2021, from <https://dev.mysql.com/doc/refman/8.0/en/what-is-mysql.html>

[23] Hivelocity. (2020, November 5). Company History. Retrieved April 13, 2021, from <https://www.hivelocity.net/about/our-company/>

Angular Framework

Angular is an HTML and TypeScript-based platform and framework for developing single-page client applications. TypeScript is used to write Angular. The main and optional features are implemented by TypeScript libraries that can be imported into applications. It comes with a collection of well-integrated libraries that cover a wide range of features, such as routing, form management, client-server communication, and more. A collection of tools to support developers in the creating, building, testing, and updating codes.²⁴

Ionic

Ionic Framework is an open source user interface toolkit for creating high-quality mobile and desktop apps using web technologies such as HTML, CSS, and JavaScript. This framework focuses on an app's frontend UX (user experience) and UI (user interface) interaction — UI controls, interactions, gestures, and animations. It is simple to pick up and integrate with other libraries and frameworks like Angular, React, and Vue. It can also be used standalone without any frontend framework using a simple script include. Ionic is the only mobile app framework that allows software developers to create applications for all major app stores as well as the mobile web using a single codebase. With powerful hardware accelerated transitions and touch-optimized gestures, it's designed to work and act well on the new mobile devices.²⁵

PHP

PHP (hypertext preprocessor) is a commonly used open source general-purpose scripting language that is particularly suitable for web development

[26] PHP: What is PHP? - Manual. (n.d.). Retrieved April 14, 2021, from <https://www.php.net/manual/en/intro-what-is.php>

[27] Wood, A. (2020, January 15). HTML5 Basics For Everyone Tired Of Reading About Deprecated. . . Retrieved April 14, 2021, from <https://html.com/html5/>

and can be embedded in HTML. PHP is mostly used for server-side scripting, but it can also be used to collect data from forms, create dynamic page material, and send and receive cookies. PHP is compatible with Linux, several Unix versions (including HP-UX, Solaris, and OpenBSD), Microsoft Windows, macOS, RISC OS, and most other operating systems. PHP's support for a wide variety of databases is one of its best and most important features. Using one of the database-specific extensions, creating a database-enabled web page is extremely easy (e.g., for mysql). For a beginner, PHP is really basic, but it has a lot of advanced features for a skilled programmer.²⁶

HTML5

The language used for web documents is HTML, or HyperText Markup Language. It's not a programming language; rather, it's a language for determining the context, intent, and structure of text within a document. HTML has existed for quite some time. Its origins can be traced back to Tim Berners-ENQUIRE Lee's project from 1980. Lee proposed a new hypertext framework based on ENQUIRE (and other systems including Apple's HyperCard) in 1989. This was the first edition of HTML, as we know it today. Since then, the language has been evolving at a rapid rate.

HTML5 is the most recent version of the HTML language, and it marked a significant departure from previous markup activities. The aim of the major improvements to the language was to standardize the many new ways that developers were using it, as well as to promote a single collection of web development best practices.²⁷

[26] PHP: What is PHP? - Manual. (n.d.). Retrieved April 14, 2021, from <https://www.php.net/manual/en/intro-what-is.php>

[27] Wood, A. (2020, January 15). HTML5 Basics For Everyone Tired Of Reading About Deprecated. . . Retrieved April 14, 2021, from <https://html.com/html5/>

TypeScript

TypeScript is an open-source language that adds static type definitions to JavaScript, one of the most widely used programming languages. Types offer a way to define the form of an object, allowing TypeScript to verify that the code is working correctly and having better documentation. Type inference helps to get a lot of power without writing any additional code, so writing types is optional in TypeScript. TypeScript is a variant of JavaScript. Among modern programming languages, the relationship between TypeScript (TS) and JavaScript (JS) is quite peculiar. JavaScript (also known as ECMAScript) began life as a basic browser scripting language. It was intended to be used for short snippets of code embedded in a web page when it was created. Some languages would refuse to run faulty programs at all. Static testing is the process of detecting errors in code without running it. Static type testing is the process of determining what is and is not an error depending on the types of values being used. TypeScript is a static type checker that checks a program for errors before executing it.²⁸

[28] Typed JavaScript at Any Scale. (n.d.). Retrieved April 14, 2021, from <https://www.typescriptlang.org/>

CHAPTER IV

METHODOLOGY, RESULTS AND DISCUSSION

4.1 Agile Methodology

The study employed the agile approach, a modern type of software development methodology. An Agile approach is used to develop the proposed system. Agile is a lightweight software development method. The most essential factor in this model is customer satisfaction, which is achieved by delivering small and useful updates in a timely and consistent manner, hence, improvements to the application are easy to implement. The Agile Process software development life cycle is depicted in Figure 2.

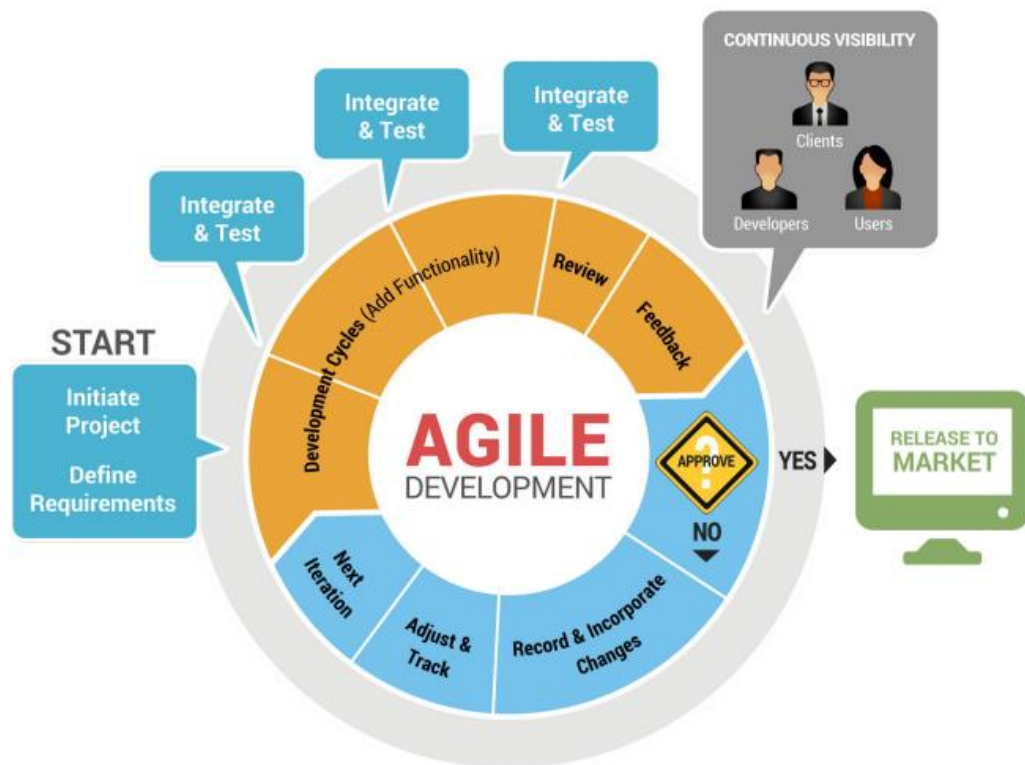


Figure 2. Agile System Development Life Cycle of the Study²⁹.

[29] Karol Fitzgerald, L-M. Browne, and Ray F. Butler. 2019. Using the Agile software development lifecycle to develop a standalone application for generating colour magnitude diagrams. *Astronomy and Computing*, 28, p.100283.

4.2 Conceptual Model

A conceptual model of the study is shown below in figure 3, based on concepts, theories, and findings from relevant literatures, studies reviewed, and insights gained from them:

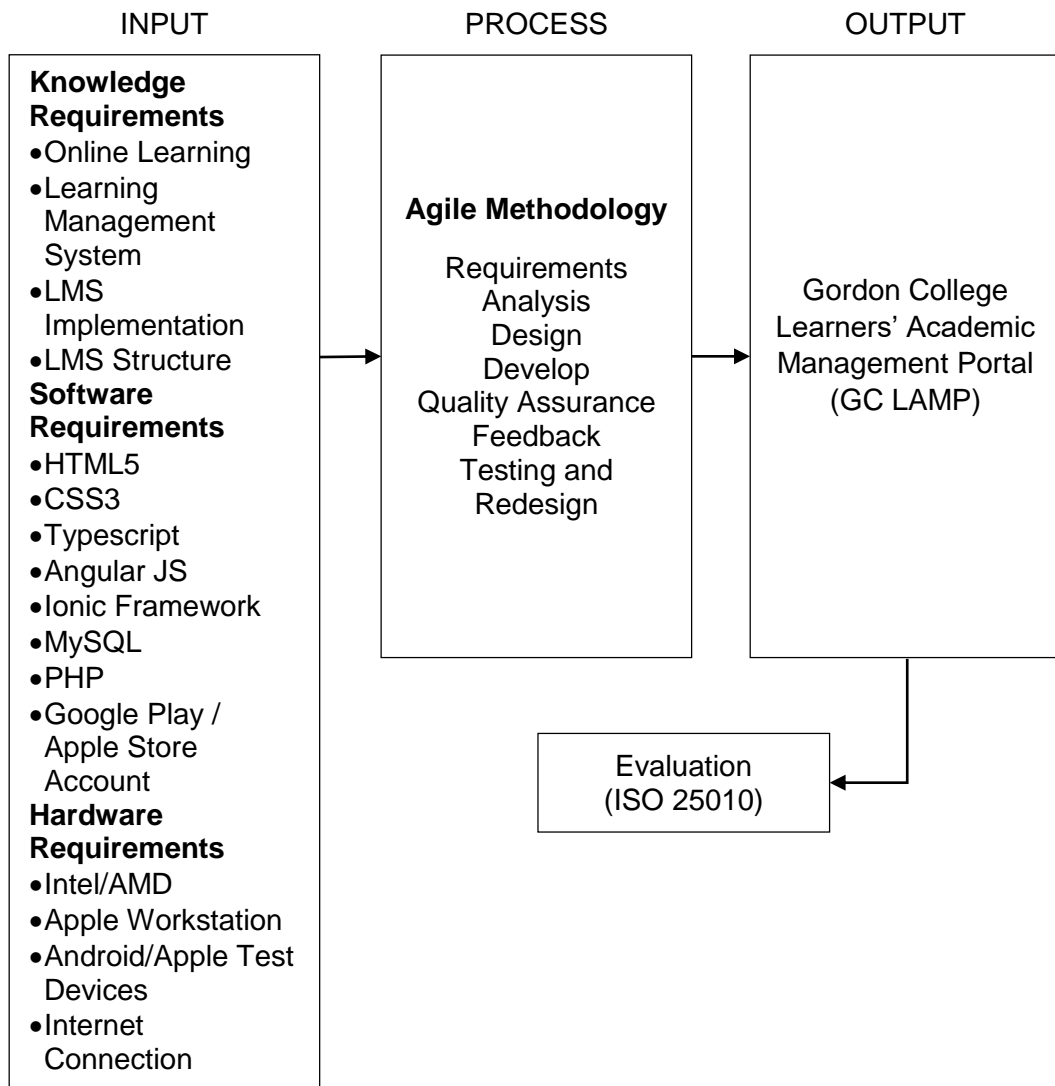


Figure 3. The Conceptual Model of the Study.

4.3 Data Flow Diagram

A data flow diagram is a visual representation of a system's boundaries, data inputs, and outputs that can be used to summarize and organize detailed details. The context diagram of the study is shown in figure 4.

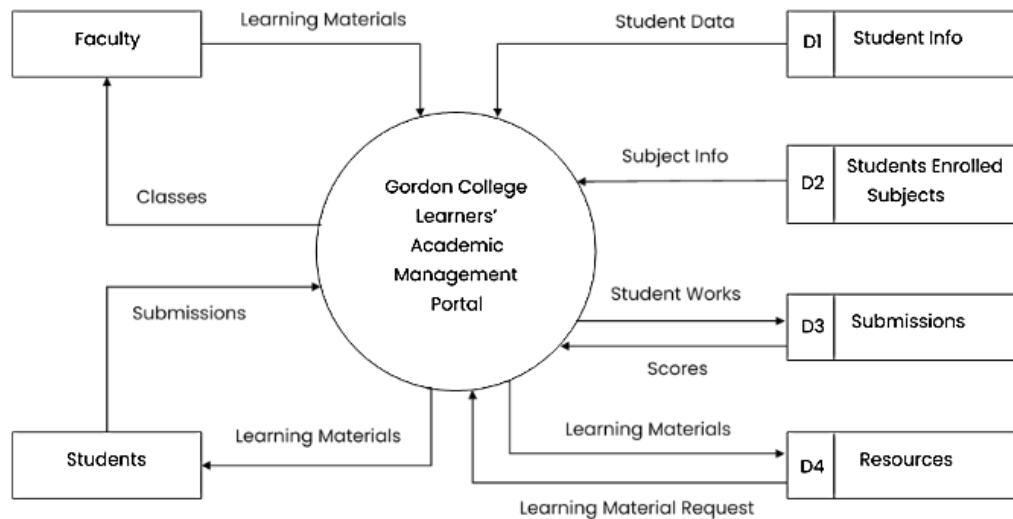


Figure 4. The Context Diagram of the Study.

4.4 System Architecture

This section presents the system architecture of the study. The study is a web and mobile application utilizing Web technologies and the Internet for users to access the LMS.

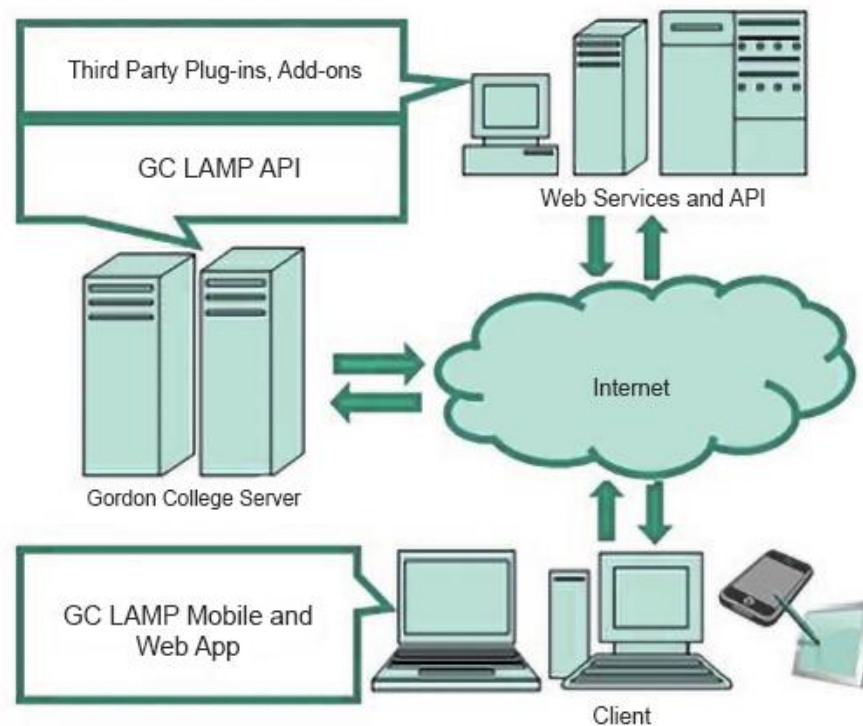


Figure 5. The System Architecture of the Study.

CHAPTER V

SUMMARY CONCLUSION AND RECOMMENDATION

5.1 Summary

To summarize, the proponents found that the system is functional and accessible. The system will serve as a powerful e-learning tool of the institution. It allows the user to acquire reliable, on-line learning resources that help students and teachers spread their learning materials. The proponents gathered data to improve the system. The instrument used for data-gathering for this study was ISO 25010 Software Evaluation Instrument through Google Forms. The ISO 25010 software quality model, shown in figure 6, identifies seven main characteristics—functionality, reliability, usability, efficiency, maintainability, and portability and security. The questions are also modified based on the necessary processes the system needed.

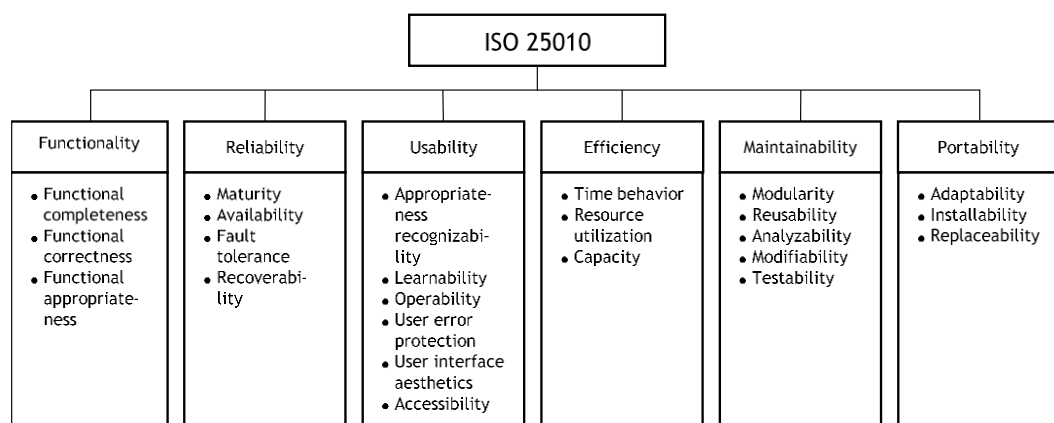


Figure 6. The modified ISO standard for mobile application development³⁰.

[30] Mariem Haoues, Asma Sellami, Hanène Ben-Abdallah, and Laila Cheikhi. 2017. A guideline for software architecture selection based on ISO 25010 quality related characteristics. *International Journal of System Assurance Engineering and Management*, 8(2)

The 13 respondents of Faculty Panel and 204 respondents of Student Panel rated the respective questions based on how they experienced the system performance by using a scale (see Table 1).

Range	Interpretation of Results
4.50-5.00	Excellent
3.50-4.49	Very Good
2.50-3.49	Good
1.49-2.29	Fair
1.00-1.49	Poor

Table 1. Scale Method

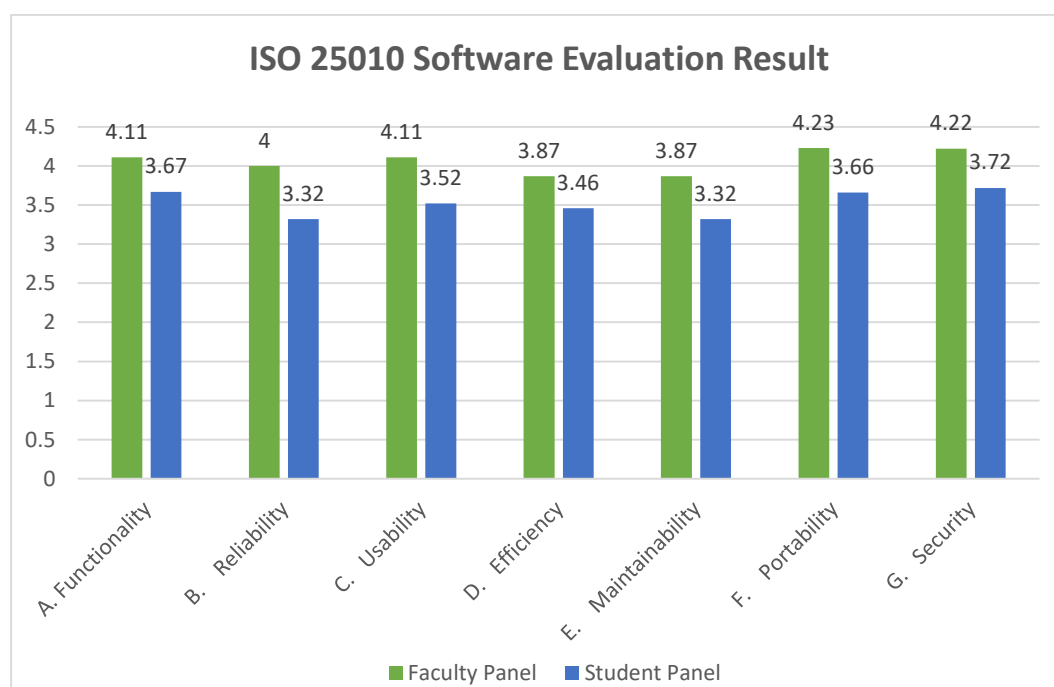


Figure 7. GC LAMP Student Panel ISO 25010 Software Evaluation Result for Faculty and Student Panel

5.2 Conclusion

The GC LAMP was developed to have a simpler, more rapid and easier platform for the retrieval of the educational materials of the students. The Gordon College Learners' Academic Management Portal reduces time and effort for distributing learning materials and provides students access to knowledge even outside of the classroom.

Based on the features of the study, the following objectives of GC LAMP have all been achieved:

1. Reduce expenses by providing an online platform to aid distance learning to continue monitoring student's academic performance on remote teaching.
2. Provide a centralized repository of learning materials in different formats that users can access and share at anytime and anywhere
3. Encouraged engagement between students and faculty despite of not being physically present.
4. Provide a platform to announce news and reliable source of information about the institution.

5.2 Recommendation

The proponents assumed that the application was convenient to users based on the information gathered. The dissemination of learning materials to users is found to be effective and reliable. In the scope and goals, the system was able to implement the necessary functionality.

The proponents recommend to future researchers to improve the user interface of the system and to incorporate the following features:

- Video Conferencing feature
- In-App Messaging
- Real-Time Notification in mobile app
- Creating Students quizzes in the app

The use technology provides innovative ways to complement the traditional student-teacher interaction worldwide, to optimize resource usage, sharing and collaboration. Therefore, the development of learning management system has been given a high priority and is therefore relevant.

VI

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