**QUEZON CITY UNIVERSITY**

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**PROPOSED PROJECT**

**LAN BASED SCHOOL LIBRARY MANAGEMENT SYSTEM**

**A Project Presented to the**

**Faculty of**

**College of Computer Science and Information Technology**

**In Partial Fulfillment of the Requirements for the Subject**

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It’s pleasure to avail this opportunity to express proponent’s deepest sincere.

Thank you!

**ABSTRACT**

This paper describes the design of a LAN-based School Library Management System for North Fairview High School (NFHS), which aims to provide an effective and efficient way of cataloguing, searching, managing borrower’s information and generate a code for logging in/out of students and for monitoring the books that borrows. Information gathered from various literature and study, onsite visits to school libraries, brainstorming sessions with students who have library experience and observation on the present systems used, have helped produce ideas in designing and implementing the systems. LAN-based School Library Management System consists of one user; the librarian; who have an access to manage the system. This paper also presents the strengths and limitations of the systems, and also the possible future enhancements.

TABLE OF CONTENTS

TITLE PAGE NO.

**TITLE PAGE**

ACKNOWLEDGEMENT 2

ABSTRACT 3

LIST OF APPENDICES 5

LIST OF TABLES 6

LIST OF FIGURES 7

Chapter 1: project background

introduction 8

BACKGROUND OF THE PROJECT 8

**STATEMENT OF OBJECTIVES**

GENERAL OBJECTIVES 10

SPECIFIC OBJECTIVES 10

**SCOPE AND LIMITATIONS/DELIMITATIONS OF THE PROJECT**

SCOPE 10

LIMITATIONS/DELIMITATIONS 11

METHODOLOGY 12

SIGNIFICANCE OF THE PROJECT 14

DEFINITION OF TERMS 15

Chapter 2: REVIEW OR RELATEF LITERATURE, STUDIES AND SYSTEMS

FOREIGN LITERATURE, STUDIES AND SYSTEMS 20

LOCAL LITERATURE, STUDIES AND SYSTEMS 23

SYNTHESIS OF THE REVIEWED LITERATURE, STUDIES AND SYSTEMS 26

Chapter 3: COST – BENEFIT ANALYSIS

TECHNICAL FEASIBILITY 28

OPERATIONAL FEASIBILITY 28

ECONOMIC FEASIBILITY 29

COST BENEFIT ANALYSIS 30

BIBLIOGRAPHY 33

**LIST OF APPENDICES**

Appendix Title Page No.

A Gantt Chart 35

B Context Diagram 36

C Entity – Relationship Diagram 37

D Data Dictionary 38

E Use-Case Diagram 42

F Program Flowchart 43

G Screenshots with Description 44

H Curriculum Vitae 50

**LIST OF TABLES**

Number Title Page

**1** Data Dictionary 38-41

**2** Cost Benefit Analysis 30-32

**LIST OF FIGURES**

Number Title Page

A Gantt Chart 35

B Context Diagram 36

C Entity – Relationship Diagram 37

D Data Dictionary 38

E Use-Case Diagram 42

F Program Flowchart 43

G Screenshots with Description 44

H Curriculum Vitae 50

**CHAPTER I**

**BACKGROUND OF THE PROJECT**

**Introduction**

A library management system is software that is designed to manage all the functions of a library. It helps librarian to maintain the database of new books and the books that are borrowed by members along with their due dates.This system completely automates all your library’s activities. The best way to maintain, organize, and handle countless books systematically is to implement a library management system software. A library management system is used to maintain library records. It tracks the records of the number of books in the library, how many books are issued, or how many books have been returned or renewed or late fine charges, etc. You can find books in an instant, issue/reissue books quickly, and manage all the data efficiently and orderly using this system. The purpose of a library management system is to provide instant and accurate data regarding any type of book, thereby saving a lot of time and effort.

A local area network (LAN) is a group of computers and peripheral devices that share a common communications line or wireless link to a server within a distinct geographic area. A local area network may serve as few as two or three users in a home office or thousands of users in a corporation's central office. Homeowners and information technology (IT) administrators set up LANs so that network nodes can communicate and share resources such as printers or network storage. The library management systems' user is only available for librarians, therefore local area network is the most applicable.

If the researchers used web-based system, it could be accessed via web browsers by other users, hence the data in the system can easily be manipulated by other users. The system is connected to a database, and it is the one responsible for storing data in the system.

**Background of the Project**

North Fairview High School is situated in Auburn Street, North Fairview Park Subdivision, Quezon City. It caters to students residing not only around the neighborhood but also to places as far south as Barangay Commonwealth and up north to Novaliches, District II of Caloocan City and San Jose del Monte, Bulacan. The school opened in 1994 as an annex of Lagro High School (former name was Lagro High School-Fairview Annex) with Mrs. Justina A. Farolan as Head Teacher-In-Charge. North Fairview High School is a public educational institution located in Quezon City. It offers education for junior and senior high school. The GAS and ABM strands and the Technical-Vocational-Livelihood track are offered for senior high school. The school is also recognized by the Department of Education (DepEd). The school started with the first-year level that was housed in an eight-room stored two stored school building. A year after, a three-room makeshift building was built and added to accommodate more enrollees which included second year students. Seven sections for first and second year students were served.With the active participation and support of the Parents-Teachers Association, school facilities in the form of additional chairs, benches, tables, gate and perimeter fence were provided and built.

The North Fairview High School has a manual library system only, thus the process of time-in and time-out, recording and managing of books is time-consuming and it is costly because it requires a lot of papers. Students can borrow books only inside the library, they cannot bring books outside the campus which limits the usability of the library. Overtime the records might overload and makes the data hard to manage. Without a search query it will be hard to find an existing data when needed. Another problem is keeping the data secured because the record is only kept in the logbook. If the logbook were to disappear it would cause a huge problem in the system especially when there is no backup. In addition, students can manipulate the data they input in time-in because they manually fill-up their record.

The proponents proposed School Library System. It is a LAN-based that manages all kinds of purposes in what a library can do. The library management system is one of the necessary systems that school must have. One of the main functions is management of the books with the use of QR codes to give a unique identity to the books to track if it is in the library or borrowed by a student. The system also provides records of borrowed books, what time the book is borrowed, and when is the due date of the returning books. For the students who come to read and borrow books in the library, they will require to have a library card with a QR code as it will serve as their identification and logbook in the library. Compared to the traditional library system wherein every student and borrower of books need to have their attendance by using a logbook and write down their name, id no, and as well as the librarian will write down the borrowed books, the title of the books, books id, and author of the books and its due date of returning.

The possible solution for time-in is by utilizing a QR Code. Requiring a library card for students is a must and putting a QR Code in the card with the details of the unique students is a good way to solve the issue of the students’ manipulation of data. In a manual library system, if a librarian would want to know if a specific book is available, they would check it manually in the books’ respective place which makes it time-consuming especially If the library is huge. Creating a system that has a search function is the best way to resolve this problem. In terms of data management, it is better to have a database because it is easier to organize and find data in the system. Additionally, it is easier to make a back-up with database rather than the traditional library system.

**Statement of Objectives**

**General Objective**

The main objective of the proponents is to design a library management system

that facilitates all activities inside the library.

**Specific Objectives**

1. To determine the operation of the library system.

2. To determine the problem of the system.

3. To create a solution with the capabilities of a system.

4. Testing the system.

5. To implement the system.

**Scope and Delimitations of the Project**

**Scope**

1. The system would only provide basic set of features to add/update the books and borrower’s information.

2. The proposed library system can only be utilized by the librarians.

3. This system has a section wherein librarians can view the information of books. This library system contains all the books stored.

4. The system has a function that can generate and scan a QR code on a Library Card that will be used for the following purposes:

* This QR code will be used for logging in and out of the students every time they go to the library.
* This will be used also to monitor the students every time they borrow a book. The QR code will display the following:

• This will display the information of the student including:

- Student name

- Student number

- Grade/ Section

- Contact number

• All the information of the book they borrowed including:

- BOOK ID

- Name of the book and the version of it

- Author

- Classification of the book.

* The date when they borrow and will return the book.

• The penalty they caught when they lost, forgetting to return the book on the expected date and other offenses.

5. This system can compute all the penalties of the student when borrowing a book depending on what policies and regulations of the library.

6. The system has a search query that can use to track what's the status of the book if it's returned and unreturned.

**Limitations|Delimitations**

1. This system cannot remind borrowers the due date of their borrowed books automatically because it has no automated notification system.
2. The system can’t create a library card.
3. This system does not support reservation of books because the type of the system is Lan Based.
4. This system doesn’t include electronic books because this type of books is usually intended for online based library system that everyone can read.

**Methodology**

Chart

Description automatically generated

1 **Planning**

* 1. Scheduling
* Use of Gantt chart to illustrates a project schedule.
  1. Knowing the workflow of the Company
* knowing the workflow of the company by observation and conducting interview inside the school.
  1. Defining the problem
* The problem will determine by observation and conducting interview inside the school
  1. Cost Estimation
* Project Resource Cost x Project time = Project cost.

2 **Analysis**

2.1 Define System Requirements

* The system requirements are determined based on the existing system and discovered problem in the school.

2.3 Collaborate with the IT team

* Schedule a meeting with project manager, developers, and client.

2.4 Assign Task

* Determine the developer capability and assigning a specified task in every department.

**3 Design**

3.1 Establish software development patterns

* Create Flowchart to determine the flow of the system
* Entity-relationship Diagram (ERD) to create a relationship between the table and entities in the database
* Use of Gantt chart to illustrates a project schedule.

3.2 Prototyping the system

* Creating a prototype system to check the implemented system requirements and design.

3.3 Use of Rapid Application Development method

* By using (RAD) Development time is drastically reduced and also time between prototypes and iterations is shortened.

**4 Development**

4.1 Development of the system based on the Rapid Application Development method

**5 Testing**

5.1 ISO 9126

* The proponents used ISO 25010 to test the Functional Suitability, Performance Efficiency, Compatibility, Reliability, Security, Maintainability, and Portability of the system.

**6 Deployment**

6.1 Deploying the system with the complete requirements

* Deploying all the hardware and software in target area.

6.2 Operation and Maintenance

* Supervising the performance of the system

6.4 Upgrading the system

* Providing updates which add new features and functions for the better efficiency of system performance.

**Significance of the Project**

The System may bring some benefits to the following individuals:

Librarian - The system will help them to generate all the reports in a minimum amount of time and minimize the use of papers such as logbooks, library cards and other forms that the librarian used at the current system, which in turn will reduce the risk of transmitting virus.

Students - The new system will lessen their time in borrowing books.

❤️

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This system helps to manage the entire library operations from maintaining book records to issue a book. It is easier to search for books and find the right materials for students and the librarian.

**Definition of Terms**

**ANALYSIS:** Analysis is the process of breaking a complex topic or substance into smaller parts in order to gain a better understanding of it.

## COMPATIBILITY: Compatibility is the capacity for two systems to work together without having to be altered to do so. Compatible software applications use the same data formats. For example, if word processor applications are compatible, users should be able to open their document files in either product.

**CONTEXT DIAGRAM:** A system context diagram in engineering is a diagram that defines the boundary between the system or part of a system, and its environment, showing the entities that interact with it. This diagram is a high-level view of a system

**CURRICULUM VITAE:** A curriculum vitae, often abbreviated as CV, is a document that job applicants use to showcase their academic and accomplishments. It is used to apply for positions within areas where a person’s specific knowledge or expertise is required.

**DATA:** Data is defined as facts or figures, or information that's stored in or used by a computer. An example of data is information collected for a research paper.

**DATABASE:** A database is an information that is set up for easy access, management, and updating. Computer databases typically store aggregations that contain information, such as sales transactions, customer data, financials, and product information.

**DATA FLOW DIAGRAM:** A data-flow diagram is a way of representing a flow of data through a process or a system. The DFD also provides information about the outputs and inputs of each entity and the process itself.

**DATA DICTIONARY**: A data dictionary, or metadata repository, as defined in the IBM Dictionary of Computing, is a "centralized repository of information about data such as meaning, relationships to other data, origin, usage, and format". Oracle defines it as a collection of tables with metadata.

**DECIPHER:** means translate from code, or more generally, figure out. If you can’t decipher your teacher's writing, it means you can't read it. You might feel like you're being asked to decipher a code.

**DESIGN**: A design is a plan or specification for the construction of an object or system or for the implementation of an activity or process, or the result of that plan or specification in the form of a prototype, product or process.

**DEVELOPING**: adjective. undergoing development; growing; evolving. (of a nation or geographical area) having a standard of living or level of industrial production well below that possible with financial or technical aid; not yet highly industrialized: the developing world.

**ENTITY-RELATIONSHIP DIAGRAM:** An entity-relationship diagram (ERD), also known as an entity-relationship model, is a graphical representation that depicts relationships among people, objects, places, concepts, or events within an information technology (IT) system.

**ERGONOMIC DESIGN**: Ergonomics is the process of designing or arranging workplaces, products, and systems so that they fit the people who use them.

**FEASIBLE:** Feasibility, as it relates to research, is the extent to which those who implement a research study or an intervention can practically do so within an identified authentic setting.

**FUNCTIONAL SUITABILITY:** This characteristic represents the degree to which a product or system provides functions that meet stated and implied needs when used under specified conditions.

**GANTT CHART:** A Gantt chart is a type of bar chart that illustrates a project schedule, named after its popularizer, Henry Gantt, who designed such a chart around the years 1910–1915. Modern Gantt charts also show the dependency relationships between activities and the current schedule status.

**GEOGRAPHIC AREA:** An area of land that can be considered as a unit for the purposes of some geographical classification.

**HARDWARE**: is the collection of all the parts you can physically touch.

**ITERATIVE METHOD:** The **Iterative Method** is a mathematical way of solving a problem that generates a sequence of approximations. This method is applicable for both linear and nonlinear problems with a large number of variables.

**LAN**: A local area network is a computer network that interconnects computers within a limited area such as a residence, school, laboratory, university campus, or office building.

**LOG-BOOK:** A logbook is a record of important events in the management, operation, and navigation of a ship. It is essential to traditional navigation and must be filled in at least daily.

**MAINTAINABILITY:** the degree of facility with which equipment or system is capable of being retained in, or restored to, serviceable operation.

**NETWORK:** Networking is the exchange of information and ideas among people with a common profession or special interest, usually in an informal social setting. Networking often begins with a single point of common ground.

**NETWORKING DESIGN:** Network planning and design is an iterative process, encompassing topological design, network synthesis, and network realization, and is aimed at ensuring that a new telecommunications network or service meets the needs of the subscriber and operator.

**NETWORK STORAGE**: Network-attached storage (NAS) is a file-level storage architecture that makes stored data more accessible to networked devices. ... NAS gives networks a single access point for storage with built-in security, management, and fault-tolerant capabilities.

**NETWORK HUB**: A network hub is a node that broadcasts data to every computer or Ethernet-based device connected to it. A hub is less sophisticated than the latter of which can isolate data transmissions to specific devices.

**PLANNING:** Planning may be defined as deciding in advance what to be done in the future. It is the process of thinking before doing. It involves a determination of goals as well as the activities required to be undertaken to achieve the goals.

**PERFORMANCE EFFICIENCY**: is given out as a percentage, and is expressed as the actual output produced by a person, and then compared with the expected output.

**PROGRAMMER**: A programmer is an individual that writes/creates computer software or applications by giving computer-specific programming instructions. ... A programmer also may specialize in one or more computing fields, like database, security, or software/firmware/mobile/Web development.

**PROGRAM FLOWCHART:** The is a data flow that shows the data flow while writing a program or algorithm. It allows the user to explain the process quickly as they collaborate with others. These programming flowcharts also analyze the logic behind the program to process the code of the programming.

**PROTOTYPE:** A prototype is an early sample, model, or release of a product built to test a concept or process. It is a term used in a variety of contexts, including semantics, design, electronics, and software programming

## PORTABILITY: Portability is a characteristic attributed to a computer program if it can be used in operating systems other than the one in which it was created without requiring major rework.

**QUERY:** A query is a request for data or information from a database table or combination of tables. This data may be generated as results returned by Structured Query Language (SQL) or as pictorials, graphs, or complex results, e.g., trend analyses from data-mining tools.

**QR CODE**: a machine-readable code consisting of an array of black and white squares, typically used for storing URLs or other information for reading by the camera on a smartphone.

**RELIABILITY:** Reliability is defined as the probability that a product, system, or service will perform its intended function adequately for a specified period of time, or will operate in a defined environment without failure.

**SERVER:** In computing, a server is a piece of computer hardware or software that provides functionality for other programs or devices, called "clients". This architecture is called the client-server model.

**SOFTWARE:** on the other hand, is not something you can touch. Software is a set of instructions for a computer to perform specific operations.

**SYSTEM:** A system is a set of rules, an arrangement of things, or a group of related things that work toward a common goal.

**TIMELINE:** A timeline is a list of important events arranged in the order in which they happened.

**USE-CASE DIAGRAM:** A use case diagram is a way to summarize details of a system and the users within that system. It is generally shown as a graphic depiction of interactions among different elements in a system.

**WEB-BASED SYSTEM:** A web-based system is an application that is accessed via HTTP. The term web-based is usually used to describe applications that run in a web browser. It can, though, also be used to describe applications that have a very small component of the solution loaded on the client PC.

**WEB BROWSER**: A web browser, or simply "browser," is an application used to access and view websites. Common web browsers include Microsoft Internet Explorer, Google Chrome, Mozilla Firefox, and Apple Safari.

**WIRELESS**: Wireless communication is the transfer of information between two or more points that do not use an electrical conductor as a medium by which to perform the transfer.

**CHAPTER II**

**REVIEW OF RELATED LITERATURE, STUDIES AND SYSTEMS**

**Foreign Literature, Studies and Systems**

According to Lisa Krolak all over the world libraries are dedicated to providing free and equitable access to information for all, be it in written, electronic or audiovisual form. They play a key role in creating literate environments and promoting literacy by offering relevant and attractive reading material for all ages and all literacy levels and by offering adult and family literacy classes. They embrace the social responsibility to offer services that bridge social, political, and economic barriers and traditionally make a special effort to extend their services to marginalized people. Libraries assist in finding, using, and interpreting appropriate information that opens up opportunities for lifelong learning, literacy enhancement, informed citizenship, recreation, creative imagination, individual research, critical thinking, and ultimately, empowerment in an increasingly complex world.

This year the summer training project titled ‘College Library Management’ is a vast one with the usage of numerous Resources and popular software like the Microsoft Visual Studio 2008 and SQL server management to build a website for the easiness of the library staff.

ILS an integrated library system also known as a library management system (LMS) is an integrated set of applications designed to perform the business and technical functions of library acquisitions, cataloguing, circulation, and the provision of public access.

A library is an organized collection of information sources which is made accessible to the people. The library usually contains the information physically or in a digitized format. In the olden period the access was usually in the library room as the technology grew up the access that was made online (Dinesh et al.,2015). Library is a fast-growing organism. The ancient methods to maintain it are no longer dynamic and efficient. For expeditious retrieval and dissemination of information and better service for the clientele, application of modern techniques has become absolutely indispensable (Neelakandan et al., 2010). Libraries can be divided into categories by several types, which are: Academic libraries, Corporate libraries, Government libraries such as national libraries, Historical society libraries, Private libraries, Public libraries, School libraries, Special libraries, Digital libraries ,Picture (photograph) libraries, Slide libraries, Tool libraries, Architecture libraries, Fine arts libraries, Medical libraries, Theological libraries etc.

According to (Burke ,2007) Manual Library Management systems, operating systems are vulnerable to human error. For instance, a librarian who misfiles a borrower's records or indexes a book incorrectly slows down the process and wastes students' time. Manual systems are also slow to operate. Instead of using a computer to issue and take back books, locating and updating a card index is slow and laborious. Manual systems are unable to store large amounts of data efficiently. With manual systems Librarian spend a lot of their time on mechanical, clerical tasks rather than liaising with library visitors. Library System Library systems also known is a set of applications designed to perform the business and technical functions of library including acquisitions, cataloging, circulation and the provision of public access.

According to E.Valenti(2016) from the article entitled “The State Of Library Management Systems” are systems that helps big in terms of some transactions on the library. On this article the automated library systems said that it can do multitasking. It can do recording books on library but it can also make different transactions. It will make the library service convenient like making card cataloging. Therefore multitasking inside the library is very nice. The system will be the one who records all the transactions inside the library so it decreases the tasks of the librarian so it can avoid the cases of lost records due to human errors.

According to mr. Edmund (2008), the open source library management systems have improved steadily in the last five years. They now present a credible option for small to medium libraries and library networks. An approach to their evaluation is proposed that takes account of three additional dimensions that only open source can offer: the developer and support community, the source.

According to Hardyanto W. (2018) the library management system that has been in existence since 2009 needs to be re-evaluated so that the system can meet the needs of both operator and Unnes user in particular, and users from outside Unnes in general. This study aims to evaluate and improve the existing library management system to produce a system that is accountable and able to meet the needs of end users, as well as produce a library management system that is integrated Unnes.

According to Ms. Atuase (2019), the library Management systems are useful technological innovations used in libraries. The benefits that accrue to a library through the use of LMS is innumerable since all facets of the library’s operations and service delivery procedures are affected upon the entry or establishment of LMS in the library. There is absolutely no doubt whatsoever that the implementation of LMS in the libraries of UG and UCC have introduced tremendous efficiency in library operations and also enhanced the delivery of services to library clientele at both institutions.

According to Mr. Yunos (2017), the library management system (LMS) is the most important aspects of the system where it can facilitite the work of librarian and serves the users well. Librian need to enhance their skills to facing new technology and new transition in the library environment. Integrated library system (ILS) enable to librian to communicate with all library department and speed up the work process in the library. This study show s that LMS provide some positive impact towards library environment and this integrated system should be expanded and enhance for the future in order to compete with other application system in the search engine such as google.

**Local Literature, Studies and Systems**

According to Quintin Jose V. Pastrana, this kind of library system is a big help in searching books in the library easier. This system will be administered by the university librarian and will be used by the student and school personnel as well. On borrowing books, the librarian doesn’t need to record them manually instead the system will record them automatically. OPAC can help a lot of the students. They can search or logbooks using their android devices and computer to search whether they needed books still exist in the library.

According to David T. Lourdes the developed countries where the computerized library system is a mature technology, a computerized library network is perhaps no longer a novel project. In the Philippines however, where the automated library system is available in only a handful of libraries. The DOST-ESEP Library Network was envisioned to; 1) build library resources and services in eight academic libraries; and 2) provide connectivity by means of the information highway in the Philippines, the (PH-net). Which is also the country’s gateway to the internet. It was proposed as an integral.

Overtime, Information and Communication Technology (ICT) have shown unprecedented changes to surfaces ad operations of modern libraries. Today, caring out library task and services through information and communication technology (ICT) are stablished to compliment all types of libraries, but still unsubstantiated in the majority school libraries. The library information system aids in borrowing and returning and reading materials via shopping cart and provides and organized tool in performing library task and services in public high school from basic to complementary. The librarian can add newly acquired library materials in the online catalogue. Library user can easily track reading materials usage and availability through the system.

The library is managed by the librarian accompanied with four (4) to five (5) member’s staff and library cards to the student as well as the teacher and issue of the book done by the staff member of the library through the library card. Process of maintaining data about books, transactions such as issue and return. On this system the transactions are maintained online. Students as well as teachers can search for any book, magazine, journal member etc. the teachers can also view the performance of any student of this department as well as of other departments too. A 24-hour library management, students according to their needs get the books issued and in case they are unable to return the book, they can immediately extend the date of return.

The De La Salle University-Manila has one central physical library to support the undergraduate and graduate programs of seven (7) academic units namely, College of Business and Economics, College of Computer Studies, College of Education, College of Engineering, College of Liberal Arts, College of Science, and the Graduate School of Business. Every trimester the University Library has an average number of potential users of about 10,500 undergraduate students, 3,000 graduate and post-graduate students, 480 full time faculty members, and 365 part-time faculty members. Currently the University Library contains close to 265,000 books, 10,000 audio-visual materials, and more than 31,000 bound periodicals. It provides more than 10,000 periodicals, 95% of which are accessed electronically.

According to Ms. Pangan(2018), the web and mobile applications are growing as the modern people begin to adopt and take an interest in these technologies. It becomes effective and useful for different kinds of company and establishment as it improves the quality and progress of the works. Applications continuously try to innovate different ways of making the lives of the people better, comfortable and efficient.

Public High School Online Library System (PHOLS) could surely aid the borrowing and returning process of reading materials via cart and definitely could provide an organized tool in performing library tasks and services in public high schools. PHOLS allows the addition of newly acquired reading material in the online catalog, borrowing and returning of reading materials, helps to track reading materials usage and availability, aids monitoring users’ overdue books and reading materials, and generates library reports perfectly and accurately.

The researchers propose a system that can help the library of S.V Montessori to manage and monitor the books in the easiest way, this program has many data entry features. You will be able to keep all the library members in a database. All book specifications can be recorded as well. When a student borrows a book, a simple sheet must be filled in including student and books IDs, date of issuance and return, and book’s status. When the book is returned, another simple form should be completed, which includes the member’s ID, book’s ID, and the return date.

The researchers came up and decided to propose a quick and easy transaction for all the manual difficulties in managing the Library have been rectified by implementing computerization to make it faster and reliable managing system, the researchers will also provide a user-friendly interface for the librarian and administrator and also a fast accessible database with a secure and huge amount of storage capacity. It will also provide a fast phased of technology attributed a lot to the improvement of the library system.

According to researchers (2011), the study aimed to develop a computerized user monitoring and report system for the College Library of Colegio de San Juan de Letran Calamba. The system was designed to use a barcode scanner for easy and fast access to logging in and out of patrons, monitor and identify frequent patrons, and generate necessary reports. The features of the system covered organized information of patrons, security of records, and receiving comments/messages from the server for pending transactions.

**Synthesis of the Reviewed Literature, Studies and Systems**

With the above mention studies, According to (Burke ,2007) Manual Library Management systems, operating systems are vulnerable to human error. For instance, a librarian who misfiles a borrower's records or indexes a book incorrectly slows down the process and wastes students' time. Burke mentioned the disadvantage of using Manual Library system compared to Computerized Library system. Computerized Library system aims to ease the transaction in the library. The system will improve the capabilities of the library in terms of recording, storing, searching for books, managing members and more secured data. The studies support the use of Library system system for university library. The researchers used a database to increase the efficiency of registration procedures. They also used it for purpose like data storing such as books, research, newspaper, students information,etc. and access in manipulating data in an easy way

In the article of E. Valenti entitled The State of Library Management System, library system makes library transactions easy and prevent human errors which is convenient for the librarian also gives them room to do other tasks. This article gives additional reason of the importance of having library system on the school.

According to Lisa Krolak all over the world libraries are dedicated to providing free and equitable access to information for all, be it in written, electronic or audiovisual form. They play a key role in creating literate environments and promoting literacy by offering relevant and attractive reading material for all ages and all literacy levels and by

offering adult and family literacy classes

(Dinesh et al.,2015) A library is an organized collection of information sources which is made accessible to the people. The library usually contains the information physically or in a digitized format. In the olden period the access was usually in the library room as the technology grew up the access that was made online

Therefore Accoring to E.Valenti(2016) On this article the automated library systems said that it can do multitasking. It can do recording books on library but it can also make different transactions. It will make the library service convenient like making card cataloging.

**CHAPTER III**

**COST-BENEFIT ANALYSIS**

**FEASIBILITY STUDY**

**Technical Feasibility**

The proposed system composed of 2 computer units and a QR code scanner. The QR code scanner scan the QR code and upon scanning, the application decrypts the information of the QR code and fetches the relevant details about the book from the database. 1 computer unit is connected to a Local Area Network (LAN) and connected to a single database for retrieving/sending data from the computer unit as a Server. The usage of QR code scanner keep track of all records, and make the library more directly accessible to its users. The proposed system requires a network hub for connecting the 2 computer units. The Windows 7 Professional will be used as an operating system for the computer and MySQL will used as the database of the system. These hardware and software will be used for five years to handle or to maintain the library management system with QR code scanner and the Local Area Network. The Uninterrupted Power Supply (UPS) will not be provided though it is essential; the school will decide for providing the equipment.

**Operational Feasibility**

**Functionality-** The Function of the Library Management system is to maintain the library resources in an operational way, this system can manage the borrowing and returning books and record the information of each book in the library. Our system can put a record of the student and employee who wants to borrow a book.

**Reliability-** This Library Management System helps the student, employee, and librarian to track the availability of all books in the library.

**Usability-** This system has one admin which is the librarian, librarians can use this system to record all information in the library.

**Efficiency-** Our system is very useful especially for the librarian because it’s easy to use and the librarian can record all the information in the easiest way, and also this system could help to reduce the paper in the library because we know the traditional materials in the library is paper and pen that is for the records of each student and employee who borrowing and returning books in the library.

**Maintainability-** Our System can save and update new information of the student, employees, and books in the library

**Portability**- This system is easy to use you just need to log in if you are the Librarian, and it’s easy to input some of the information provided by the student and employee.

**Economic Feasibility**

Proponents can claim that North Fairview Highschool is financially viable because it has been one of Quezon City's greatest public schools for over 27 years. The school is open to modernizing and upgrading its current system. In fact, the school has already set aside funds for the system. The school will be able to install the necessary hardware and software for the planned system.

**Cost – Benefit Analysis**

**An Analysis and Design of** (name of the company)

Cost - Benefit Analysis of the Proposed System

**Personnel Monthly Salary**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Personnel** | **Number** | **No. of Working Days** | **Hrs. / Day** | **Rate / Day** | **Salary** | **Monthly Amount** |
| Librarian | 2 | 20 Days | 8 hrs. | 650.00 | 13,000 | 26,000 |
|  | | | | | | **26,000** |

**Personnel Annual Salary**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Personnel** | **Number** | **Salary** | **Monthly Amount** | **Annual Amount** |
| Librarian | 2 | 13,000 | 26,000.00 | 624,000.00 |
|  | | | **26,000.00** | **624,000.00** |

**Hardware**

|  |  |  |  |
| --- | --- | --- | --- |
| **Quantity** | **Particular** | **Price** | **Total Price** |
| 2 | Intel Core i5 (PC Set) | 35,999.00 | 71,998.00 |
| 1 | 8-Port 10/100 SwitchDES-1008A | 999.00 | 999.00 |
| 1 | Database Server | 59,000.00 | 59,000.00 |
| 2 | AWP Aide 390W-650VA UPS/AVR (4 Sockets) | 1,290.00 | 2,580.00 |
| 2 | VP8550 2D Desktop Barcode Scanner, Omnidirectional Hands-Free Wired USB Big Barcode Reader, 1D QR! | 3,880.00 | 7,760.00 |
|  | | | **142,337.00** |

**Software**

|  |  |  |  |
| --- | --- | --- | --- |
| **Quantity** | **Particular** | **Price** | **Total Price** |
| 2 | Windows 7 Professional | 6,800.00 | 27,200.00 |
| 2 | Visual Basic.Net | 35,339.00 | 70,678.00 |
|  |  |  | 97,878.00 |

**Furniture and Fixture**

|  |  |  |  |
| --- | --- | --- | --- |
| **Quantity** | **Particular** | **Price** | **Total Price** |
| 2 | Computer Chair | 1,588.00 | 3,176.00 |
| 2 | Computer Table | 1,277.00 | 2,554.00 |
|  | | | 5,730.00 |

**Expenses**

|  |  |
| --- | --- |
| **Particular** | **Amount** |
| Hardware | 142,337.00 |
| Software | 97,878.00 |
| Furniture and Fixture | 5,730.00 |
| **Total** | 245,945.00 |

**Summary Operational Cost**

|  |  |
| --- | --- |
| **Particular** | **Cost Amount** |
| Personnel | 591,408.00 |
| Expenses | 303,260.00 |
| **Total** | **894,668.00** |

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**APPENDIX A**

**Gantt Chart**

A picture containing chart

Description automatically generated

**APPENDIX B**

Diagram

Description automatically generated**Context Diagram**

**Appendix C**

**Entity Relationship Diagram**

Diagram

Description automatically generated

**APPENDIX D**

**Data Dictionary**

**Table Name: Librarian**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data Name** | **Data Aliases** | **Data Type** | **Length** | **Description** |
| Librarian ID | Librarian\_ID | int |  | Primary Key |
| Librarian Name | Librarian\_Name | varchar | 225 | Librarian  (admin) name |
| Username | Username | varchar | 225 | Librarian  (admin) username |
| Password | Password | varchar | 225 | Librarian  (admin) password |

**Table Name: Books**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data Name** | **Data Aliases** | **Data Type** | **Length** | **Description** |
| Book ID | Book\_ID | int |  | Primary Key |
| Book Name | Book\_Title | varchar | 225 | Title of the Book |
| Author | Author | varchar | 225 | Author of the Book |
| Category | Category | varchar | 225 | Book’s Category |
| Date Published | Date\_Published | varchar | 225 | Book’s date published |
| Quantity | Quantity | int |  | Book Quantity |

**Table Name: Student**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data Name** | **Data Aliases** | **Data Type** | **Length** | **Description** |
| Student ID | Student\_ID | int |  | Primary Key |
| Student Name | Student\_Name | varchar | 225 | Student’s name |
| Grade/Section | Grade/Section | varchar | 225 | Student’s Grade/Section |
| Contact Number | Contact\_Number | varchar | 225 | Student’s Contact Number |
| Email Address | Email\_Address | varchar | 225 | Student’s Email Address |
| QR code | QR\_code |  |  | Personalized QR code of the owner. |

**Table Name: Employee**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data Name** | **Data Aliases** | **Data Type** | **Length** | **Description** |
| Employee ID | Employee\_ID | int |  | Primary Key |
| Employee Name | Student\_Name | varchar | 225 | Employee’s name |
| Contact Number | Contact\_Number | varchar | 225 | Employee’s Contact Number |
| Email Address | Email\_Address | varchar | 225 | Employee’s Email Address |
| QR code | QR\_code |  |  | Personalized QR code of the owner. |

**Table Name: Attendance History**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data Name** | **Data Aliases** | **Data Type** | **Length** | **Description** |
| Attendance ID | Attendance\_ID | int |  | Primary Key |
| Time In | Time\_in | varchar | 225 | Time in of someone who will enter in the library. |
| Time Out | Time\_out | varchar | 225 | Time out of someone who will enter in the library. |

**Table Name: Borrow History**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data Name** | **Data Aliases** | **Data Type** | **Length** | **Description** |
| Borrow ID | Borrow\_ID | int |  | Primary Key |
| Date Borrowed | Date\_borrowed | varchar | 225 | When the book was borrowed. |
| Due Date | Due\_date | varchar | 225 | When will return the book. |

**Table Name: Return History**

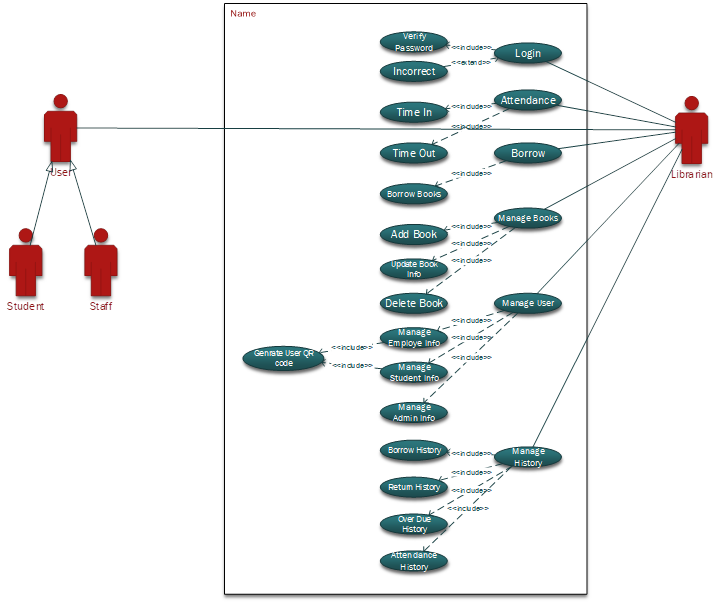
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data Name** | **Data Aliases** | **Data Type** | **Length** | **Description** |
| Return ID | Return\_ID | int |  | Primary Key |
| Date Returned | Date\_returned | varchar | 225 | When the book was return. |

**Table Name: Overdue History**

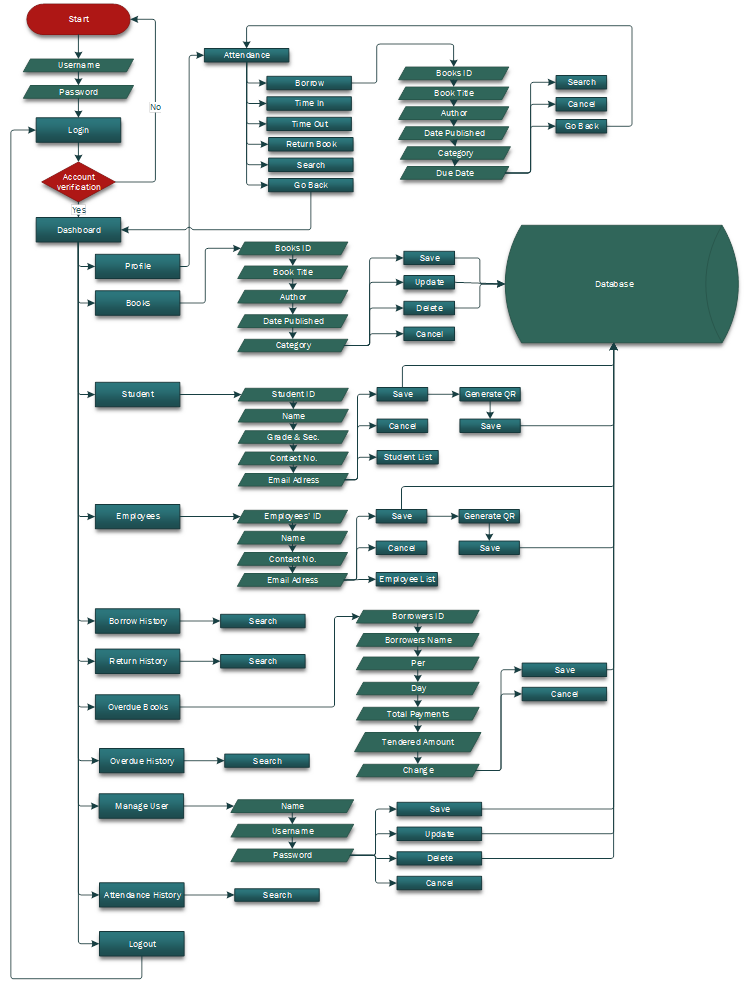
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Data Name** | **Data Aliases** | **Data Type** | **Length** | **Description** |
| Payment ID | Borrow\_ID | int |  | Primary Key |
| Date of Payment | Date \_of\_Payment | varchar | 225 | When was the penalty paid. |
| Total Payment | Total\_Payment | varchar | 225 | Total of payment. |

**APPENDIX E**

**Use Case Diagram**

****

**APPENDIX F**

**Program Flowchart**

**APPENDIX G**

**Screenshots with DescriptionGraphical user interface

Description automatically generated with medium confidenceGraphical user interface

Description automatically generated with medium confidence**

**Diagram

Description automatically generated with medium confidence**

**Login form-** This form is intended to enable the user (librarian) to access the system. Also this form serves as the primary security of the system.

Graphical user interface, application

Description automatically generated with medium confidence

**Dashboard-** This contains all the features of the system.

**Graphical user interface, application

Description automatically generated**

**Profile form-** This is the form that will be displayed once the QR code of the student/employee is scanned. This form contains the following:

* The name of the borrower.
* Information about the book they borrow.
* Their time in and out at the library.
* The history of their borrowing.

**Graphical user interface

Description automatically generated with medium confidence**

**Borrow Book form-** This form will be used to encode the information of the book that student/employee borrow.

**Table

Description automatically generated**

**Book form**- This will be used to add/update the book information. Also to search and view book information stored in a database.

**Qr code

Description automatically generated**

**Student form-** This form will be used to encode the information of the student and where the qr code will be generated.

**A picture containing graphical user interface

Description automatically generated**

**Student List form-** This form will be used to search and view the information that is encoded from the student form.

**Qr code

Description automatically generated**

**Employee form-** This form will be used to encode the information of the employee and where the qr code will be generated.

**Graphical user interface

Description automatically generated with medium confidence**

**Employee List form**- This form will be used to search and view the information that is encoded from the employee form.

**Graphical user interface, application

Description automatically generated**

**Borrow History form-** This will be used as the list/ history of the book being borrowed.Also this will help the librarian to track the status of the book if it’s returned or unreturned using search query.This form has a table that contains this following information:

* Book ID
* Book title
* Category
* Borrower ID
* Borrower Name
* Date Borrowed
* Due date

**Graphical user interface

Description automatically generated**

**Return History form-** This will be used as the list/ history of the book being returned.This form has a table that contains this following information:

* Book ID
* Book title
* Category
* Borrower ID
* Borrower Name
* Date Returned

**Chart

Description automatically generated with medium confidence**

**Overdue Books form** - This  form is intended to compute all the penalties that the borrower has.

**Graphical user interface

Description automatically generated**

**Overdue History-** This will be used to view the history of the transaction/payment that happened to the borrowers.

**Table

Description automatically generated with low confidence**

**Manage User-** This form where the librarian will create his/her own account to access the system.

**Graphical user interface, application

Description automatically generated**

**Attendance History-** This will serve as the history of logging in and out of the student/employee at the library.

**Appendix H**

**Curriculum Vitae**

**A person smiling for the camera

Description automatically generated with low confidenceKIRSTEN RAIN S.** **BUSTAMANTE**

#16 San Simon St., Brgy. Holy Spirit, Quezon City.

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**PERSONAL INFORMATION**

**Date of Birth:** March 8, 2002

**Place of Birth:** Manila

**Citizenship:** Filipino

**Gender:** Female

**Civil Status:** Single

**Interest:** Watching Anime

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**EDUCATIONAL BACKGROUND**

**Primary:** Kalayaan Elementary School- Main

**Secondary:** Kalayaan National High School

**Tertiary:**

**Bachelor:** Quezon City University (Information Technology)

A person wearing a white shirt

Description automatically generated with medium confidence**DAN JOSEPH ESPELITA**

#25 Kasunduan Ext. Brgy. Commonwealth, Quezon City.

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**PERSONAL INFORMATION**

**Date of Birth:** April 18, 2000

**Place of Birth:** Quezon City

**Citizenship:** Filipino

**Gender:** Male

**Civil Status:** Single

**Interest:** Playing online games

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**EDUCATIONAL BACKGROUND**

**Primary:** Commonwealth Elementary School

**Secondary:** Our Lady of Fatima University

**Tertiary:**

**Bachelor:** Quezon City University (Information Technology)

**A person smiling for the camera

Description automatically generated with medium confidencePRINCESS JULLA C. FALLARIA**

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\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**PERSONAL INFORMATION**

**Date of Birth:** September 15, 1997

**Place of Birth:** East Avenue, Quezon City.

**Citizenship:** Filipino

**Gender:** Female

**Civil Status:** Single

**Interest:** Watching K-drama and K-pop

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**EDUCATIONAL BACKGROUND**

**Primary:** Payatas B. Elementary School

**Secondary:** Justice Cecilia Munoz Palma High School

**Tertiary:**

**Bachelor:** Quezon City University (Information Technology)

A close-up of a person smiling

Description automatically generated**JANICE P. GARCIA**

Bistek Ville 6, Fairview, Quezon City.

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**PERSONAL INFORMATION**

**Date of Birth:** December 31, 2001

**Place of Birth:** Aguilar, Pangasinan.

**Citizenship:** Filipino

**Gender:** Female

**Civil Status:** Single

**Interest:** Watching K-drama

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**EDUCATIONAL BACKGROUND**

**Primary:**  Fairview Elementary School

**Secondary:** North Fairview High School

**Tertiary:**

**Bachelor:** Quezon City University (Information Technology)

A picture containing text, person, wall, indoor

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**PERSONAL INFORMATION**

**Date of Birth:** September 10,2001

**Place of Birth:** Valenzuela

**Citizenship:** Filipino

**Gender:** Male

**Civil Status:** Single

**Interest:** Reading manga & watching tv

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**EDUCATIONAL BACKGROUND**

**Primary:** Payatas B. Elementary School

**Secondary:** Justice Cecilia Muñoz Palma High School

**Tertiary:**

**Bachelor:** Quezon City University (Information Technology)

A person in a red shirt

Description automatically generated with medium confidence**REYMON A. HINTAPAN**

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reymonhintapan@gmail.com \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**PERSONAL INFORMATION**

**Date of Birth:** April 12, 2002

**Place of Birth:** Sinacaban, Misamis Occ.

**Citizenship:** Filipino

**Gender:** Male

**Civil Status:** Single

**Interest:** Reading articles & cooking

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**EDUCATIONAL BACKGROUND**

**Primary:** Payatas B. Elementary School

**Secondary:** Justice Cecilia Muñoz Palma High School

**Tertiary:**

**Bachelor:** Quezon City University (Information Technology)

A child in a suit

Description automatically generated with low confidence**GERMAINE B. INDIAS**

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**PERSONAL INFORMATION**

**Date of Birth:** May 7, 2002

**Place of Birth:** Moncada,Tarlac

**Citizenship:** Filipino

**Gender:** Male

**Civil Status:** Single

**Interest:** Playing online games

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**EDUCATIONAL BACKGROUND**

**Primary:**  North Fairview Elementary School

**Secondary:** North Fairview High School

**Tertiary:**

**Bachelor:** Quezon City University (Information Technology)

A picture containing text, person, work-clothing

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**PERSONAL INFORMATION**

**Date of Birth:** March 21, 2001

**Place of Birth:** Quezon City

**Citizenship:** Filipino

**Gender:** Male

**Civil Status:** Single

**Interest:** Playing volleyball

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**EDUCATIONAL BACKGROUND**

**Primary**: President Corazon C. Aquino Elementary School

**Secondary:** Batasan Hills National High School

**Tertiary:**

**Bachelor:** Quezon City University (Information Technology)

A picture containing person, indoor

Description automatically generated**JOHN CARLO A. MORAL**

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**PERSONAL INFORMATION**

**Date of Birth:** April 28, 2002

**Place of Birth:** Quezon City

**Citizenship:** Filipino

**Gender:** Male

**Civil Status:** Single

**Interest:** Playing online games

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**EDUCATIONAL BACKGROUND**

**Primary:** Guide School, Commonwealth

**Secondary:**  Commonwealth High School

**Tertiary:**

**Bachelor:** Quezon City University (Information Technology)

A person smiling for the camera

Description automatically generated with low confidence**DARRYL C. PANIS**

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**PERSONAL INFORMATION**

**Date of Birth:** November 22, 2001

**Place of Birth:** Quezon City

**Citizenship:** Filipino

**Gender:** Male

**Civil Status:** Single

**Interest:** Coding & reading manga

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**EDUCATIONAL BACKGROUND**

**Primary:**  Fairview Elementary School

**Secondary:** North Fairview High School

**Tertiary:**

**Bachelor:** Quezon City University (Information Technology)