BARANGAY ZONE 1 BULAN SORSOGON WEB-BASED

INFORMATION SYTEM

A Capstone Project

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In Partial Fulfillment

Of the Requirements for the Degree

Bachelor of Science in Information Technology

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APPROVAL SHEET

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ABSTRACT

The main purpose of this study is to develop a web-based Barangay Information System which can allow panelist and advisers to evaluate the students in their thesis/capstone projects through an innovative way of grading. It is a task for every IT, CS, IS students to train their logical thinking in which how they can solve a problem by developing a project that accessible through any forms of technology that has an internet connection.

web-based system was used to simplify the software development of the system. Entity relationship diagrams and Use Case Diagrams were used to illustrate the system functions and routines. Personal Home Page/Hypertext Processor or simply PHP is the backend we used to develop the web-based system to this study. The tools that have been used was XAMMP Server, MySQL and Bootstrap for designing the system. the fact we used for the data is interviewing the client and observation where we applied to determine the requirement of the desired application.

The propose of this study is to maintain complete and up to date which is easily accessible for storing residents' records, monitoring, paper works and some references purposes. moreover, its intended to for automate a recordkeeping process to produce efficient and accurate report and proper automated file management. it converts data into useful form that will operation works smoothly. The system assurance that the records will be protected and safe for it will also require the administrator

authorization before someone can access the system. furthermore, we ensure that the file and records will be securely stored in the system and makes backup data of the files if a technical accident will occur. The proposed system will have significant on both residents of the barangay and barangay staff who assigned to manage the system as well as the barangay itself.

The developer also suggests the following before it used to be sure that the user has a secured internet connection before using the system because it is an online web-based system. this research and development of the project also a contribution for the government sector and from the community to the ever-growing advanced technology by providing the way of evaluating the students defense for their capstone projects for the third year BSIT students.

We conduct an online evaluation for our system to our fellow student in SSU Bulan Campus we and my teammates give a short questioner about the system project.

The result of the Barangay Information System with Issuances of Barangay Certificate of online thesis/Capstone Project Defense, System showed that the development of this system will achieve its functional requirements in applying the modern way of automated barangay information system through online connection.

Our fellow student of SSU bulan campus highly recommends that the system be implemented on Bangay zone 1 bulan Sorsogon for effective and efficient record keeping and issuances of barangay certificate will achieved its goal is to keep the database design good for organizing and handling the amount of records of the barangay some

students says that we have to strengthen the system security to prevent the attacks of the system and there suggestions helped as to make our system achieved its goals, we want to implement their suggestions for improving our thesis/capstone project. The developer also suggests the following schemes to be used respectively: before using the system be sure that the user administrator and staff to be assigned have a secured internet connection; a maximum of (2) days required for user training: the function and restriction of the assigned staff for viewing some records of barangay and what is the function of the administrator of the system, How can he/she manage the record of barangay residents and a phased operation method as system changeover schemes. Using the Thesis/Capstone Project Barangay Information System is a great solution for the barangay Zone 1 for paper works, issuing of barangay certificates, keeping records of barangay and provides them an easier way of monitoring their resident’s data it’s a good benefit for the barangay to have a barangay platform now that we used advanced technology for storing records. This research and development project also contributes to the ever-growing fields of Information Technology by providing portable way of evaluating the graduating students defense for their Thesis/Capstone Projects for fourth year BSIS AND BSIT students and, to enhances and show our skills as an IT student.

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The barangay zone 1 we would like to thanks to barangay captain for their cooperation and contribution to develop this system and to almighty god for giving them strength, courage, and guidance’s to make this project possible.

DEDICATION

This research study is dedicated to everyone who helped and never give up through all the struggles that we face in accomplishing this project and made it successful one and, we and my teammates will dedicate this work to our family and friends. A special feeling of gratitude to my loving parents that always be there to support and encouragement for my dreams. We would like to thanks to our mentor for their helped supports and guides through this process and encouragement to made possible both conceptualization and completion of this proposed system project. thanks to everyone that who will believing that we accomplish this project. this would not been possible without God having in his plan. Thanks, you, and God bless!

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PROJECT OVERVIEW

This chapter presents the background of the study which establishes the context of the research. This section explains why this particular research topic is important and essential to understanding the main aspects of the study.

Introduction

This capstone project aims to provide a Barangay Information System that will store information of each resident in Barangay Zone 1 in Bulan Sorsogon including: The List of Barangay Residents, List of the Barangay Officials and the Sangguniang Kabataan members (SK), Barangay Health Workers (BHW), Barangay Police (Barangay Tanod). This Barangay Information System involves everything that has to do with adding new records of the residents, updating, deleting, and searching of specific residents' information. the purpose of this project is to aimed make solution of the problem of Barangay Zone 1 in Bulan Sorsogon on organizing the information of their residents, officials, reports and file handling, a lot of process of paperwork on the files. This Barangay Information System can reduce of manual process of paperwork's and reports on the barangay.

This project is a web-based Barangay Information Management System that handle information of the residents', salary of the barangay officials, and handling files of the barangay. It can browse the information of the residents so that it can reduces the manual process use of paperwork's it will print all the summary reports of the barangay. All the records of the residents and brgy: Officials will be stored in the database. Only the authorized person can have the rights to access the system.

This barangay information management system of zone 1 bulan Sorsogon is to develop and enhances the way of managing, issuing certificate, and keeping all the residents confidential records. It is an online and offline system to keep process retrieve and

update the records. this system maintains their residents' records as complete and up to date as possible and easily accessible for verification, monitoring, and references purposes base on available residents census the data will keep only in the barangay. this barangay information system can be accessed through any computer within a local network by simply browsing in the browser because it is a web-based system. it can be used by the assigned authorized person in the barangay, it is secured thru defined permission and access rights. It is designed to handle a wide range of information relating to the barangay profile, barangay clearance, barangay reports/cases, barangay activities and residents' information.

Rationale

The developers built and created these Barangay Information System to help the barangay Zone 1 Bulan Sorsogon in keeping records and manage information in an efficient way. Instead of using manual process, its time consuming and cause some human errors. it is good to have that the automation accomplishes a job a lot faster than the traditional way of recording the information and organizing the files of the barangay zone 1. The automated barangay information system will make keeping and retrieving of information faster in a more convenient way by storing files of the resident's information in a computer system. the main function of the system is to keep, update to date resident's information. This will reduce the time and effort of the staff that assigned in the system in processing, storing, and finding the files/ records of each resident living

in the barangay. The information in a computerized system can be viewed in easy way by browsing to any browser because it is a web-based system.

This system will contribute to enhancing and managing resident's information records.

Some benefits of this Barangay Information System:

1. **Administrator:** they can easily generate reports, view residents' information, assigned officials user. They can easily release Barangay clearance, Barangay indigence, and other business permit. they can easily monitor the population of the barangay, monitor the active case blotter.
2. **Residents:** can save time and efforts in acquiring of Barangay clearance, Barangay indigence, and other business permit.
3. **Future researchers and students:** This capstone project can serve as a reference for future projects to give them idea and knowledge on how to build this project.

Situational Analysis of the Research Topic

The system used by the officials from barangay Zone 1, Bulan Sorsogon is a manual based process for all services to their

constituent. The barangay official assigned for the processing of paper encountered difficulties and long procedure of recording, managing of files and time consuming, sometimes it will cause a human error that loss of the important data of the barangay.

Thus, this proposed Barangay Information System is appropriate for use of barangay officials, who assigned and have access to the profile information of barangay residents for the direct reports. Therefore, the barangay zone 1 have benefit of this system which can easily for them to monitor the barangay resident's growth population, they can easily issue a barangay certificate, just like barangay indigency, business permit and barangay clearances. It will help them to accomplish tasks faster. It will provide profile-based information for the residents. Barangay Information System enhances the way of managing for process of issuing of certificates and keeping the resident's records confidential.

Importance of the study

The study was designed for the Barangay Zone 1, Bulan Sorsogon. The implementation of the study is useful for appending benefits of the users. The Administrator was considered as the main important user of the system that can access the entire system and monitor the data being saved, add, and delete assigned user staff. Therefore, the administrator is the only one who will provide the user staff privileged to access the system he/she can view the resident's data, delete, edit the resident's information. The assigned staff cannot access registration, cannot edit the barangay officials position in the system. it means the user staff has a restriction to some parts of the barangay information system. The importance of this study to have an automated barangay advanced system that can process, manage, and maintains the residents record as complete and up to date and secured keeping of data. This study is deemed significant to the following:

To the Barangay Zone 1 Bulan Sorsogon. The study will help them to replace the manual system process of the Barangay Information and Manage of file.

To the Barangay Zone 1 Bulan Sorsogon. The study will help them for record keeping secured and confidential just like residents' data and issuing of barangay certificate.

Statement of the problem

The study is intended to assess the status of managing the barangay information about replacing their current way of manual system process of record keeping in Barangay Zone 1 Bulan Sorsogon and seek to answer the following questions.

1. What are the information requirements of the proposed system?

   - The Barangay Zone 1 Bulan Sorsogon Residents profile/records
   - Number residents of papulation in zone 1
   - Number of registered voters on the barangay zone 1
   - Description issuing certificates about barangay clearances
   - Resident's blotter records that have active case is that in the barangay
   - Number male and female residents in the barangay

2. What are the features of the proposed system?

   - Admin and staff registration
   - Barangay Officials Information
   - Barangay Households/Residents Information
   - Total Numbers of Barangay Population

- Total Numbers of Residents Male and Females in Barangay
- Total Numbers of Registered Voters in Barangay
- Barangay Blotter Case
- Barangay Certificate/Business permit, Barangay Indigency, Barangay Clearances

3. What is the level of usability of the proposed system in terms of?

   a. usefulness,

   b. satisfaction

   c. ease to use

The main goal of this study is to develop a Web-Based Barangay Information System that can automate the record keeping of barangay residents' data, process accurate reports and monitoring of barangay growth population and proper automated managing files. furthermore, the system can easily update residents' records.

Objectives of the Study

This study delved into the development of web-based Information System in the barangay Zone 1, Bulan Sorsogon **as a tool to their** problem on managing and manual record keeping of the resident's record of the barangay, with the following specific objectives:

with the following specific objectives:

1. To determine the information requirements of the proposed system for develop an Automated barangay information system in zone 1 Bulan Sorsogon that can

manage of barangay information about residents, records, officials, and population.

2. To identify the features and design a system solution to the problems encountered in to developing a Computerized Barangay Information System that can automate the record-keeping process to produce efficient and accurate reports and proper automated files management.

3. To determine the level of usability of the proposed system in terms of:

   a. usefulness,

   b. satisfaction, and

   c. ease of use

4. To reduce the time consumed in the process of issuing certificates such as:

   - Barangay Clearance
   - Business Permits
   - Certificate of Indigence

5. To minimize the time in writing records and eliminate the use of paper.

6. To provide backup database of all records

7. To provide an up-to-date list of residents and how many number they are in the barangay.

8. To design a system that will electronically store barangay data.

Definition of Terms

The following are the conceptual and operational definitions of terms that will be used in the study:

Information Requirements. Information requirements refer to the inputs needed of the proposed system. It includes the data that are needed to be collected to further identify and understand the system operations. Barangay Information about resident's records, total population, total male and female, official's records.

System Features. System features refer to the components of the proposed system that performs specific task for developing an automated barangay information system. It includes the operational transactions of the proposed system which includes (1) Barangay Dashboard; (2) Total residents records; (3) Total male and female; (4) Barangay Official's records; (5) Administrator User records (6) Profiling Modules.

1. Barangay Dashboard – The Dashboard in Barangay is the main part when the administrator or user official login in Barangay Information System it is the most important and useful of set of information about the barangay status, population, and residents' information.
2. Total resident's records

3. Total male and female
4. Official’s records
5. Administrator User records
6. Profiling Modules

Level of Usability. Level of usability refers to the set of tools that are used to measure and determine the capability of the proposed system. It refers to the evaluation that measures the level of usability in terms of its usefulness, satisfaction and ease of use which are factors needed to reconsider in further development of the system. The level of usability of the system is to test what is the capability of the system how does it works and ensure that the system is work properly. The purpose of the usability is to evaluate and rate the system and to provide accurate discission making on how can be improve the system.

Chapter 2

REVIEW OF RELATED LITERATURE

This chapter provides review of various related literatures on the presented objectives of the study. This includes the review on information requirements, features of the system and usability.

Information Requirements

According to the study of Charina P. Maneja, Nancy A. Tandang, Merlyne M. Paunlagui, (2012) entitled "Determinants in sustaining a local information system in the Philippines: The case of Barangay Management Information System", in the study identified the significant of having a Barangay Management Information System is individual factors that influenced the barangays' decision to sustain were the system's user-friendly features ease in managing the BMIS software, and usefulness of data generated in performing the functions of the local government officials. This system has a significant institutional factors that contributed to sustaining a Local Information System (LIS) were the active participation of the Barangay Council member in data management; the availability of budget and equipment; the presence of municipal and technical support from the municipalities and state universities and college; and utilization of data in the submission of administrative reports, situational analysis for the preparation

of plans, monitoring and targeting of beneficiaries; and the issuance of local ordinance for the adoption of LIS.

In the study mentioned above give as a motivation for as to support and pursue this proposed system, since it has a significant impact for every for every barangay of having an easy way of handling and storing the data in the barangays. The motivated as by how the system can help to our clients to have a computerized and easy way of managing data. Technology has a big impact to a human life it can help as to provide an easy way of working, transportation, healthcare, socialization, and communications, nowadays people will prefer to be used technologies than using their natural skills. It’s good to have a good technology in our current generation now that we are suffering to the pandemic.

Related Literature

According to Rosalinda C. Celeste, D.M. (2004) “In the recent years, both the national and local government planners will be focused on their development plans across sectors to maximize the use of resources. Thus, the need for small-area statistics also rises as data input for planning and project identification. The author of this book stated that planning is very important for every national and local government because it helps them systematic process of the data for the small-area and process during which decision will made for the goals and activities, just like barangay using a manual system method to plan on what is the possible solution to make the system work faster.

According to Maneja, Charina P. (University Knowledge Digital Repository, 2012-07-01) On their project, Intitled

Barangay Management Information System (BMIS) stated that Barangay Management Information System is important for the executive and legislative functions of local officials. In the study said determined the institutional and individual factors that contributed for sustaining a Barangay Management Information System (BMIS). The study was done in five provinces covering 90 randomly selected continuing barangays and 68 randomly selected continuing barangays.

This related system is significant to our proposed study because the barangay zone 1 Bulan Sorsogon is also dealing with this type of problem such as managing and organizing their residents record keeping secured. this system is differences to our system because our study is intended only for the barangay zone 1 Bulan Sorsogon and not covered the Local Government of Bulan Sorsogon.

In related to the study by Celia M. Reyes and Kenneth C. Illarde (1996), entitled community-based monitoring system for poverty tracking (CBMS) was developed by Micro Impacts and Microeconomic Adjustment Policy Project (MIMAP). The main goal of their system is to generate data on a predetermined set of Minimum Basic Needs (MBN) at the barangay level and entails the participation of people in the community to collect, process and use the data. The system will provide information on the welfare conditions of all members of the community.

This related research is relevant to the present study because it focuses on improving the service in community, however the study of Celia M. Reyes and Kenneth C. Illarde is to develop a community-based monitoring system to monitor the different barangay needs about the health service’s needs, poverty, nutrition, income and livelihoods, shelter, basic education, and Political participation. this system is different from our study because in our study the only focuses on the barangay information although there are corelated to our study because we gather information but only in the barangay.

In the study of Paderes, A.S; Lazaro, S.C.; Baltazar, A.G.; Ponce, A.R. (1999). Their study entitled Barangay [Village] Information System (BIS): A tool for local planning and project

implementation showed that the processes involved in the implementation of a BIS [barangay information system] in a locality included BIS Team formation; information need identification; collection, encoding/tabulation, analysis, and presentation; and storage and updating of information regarding the barangay's history, geography, demography, and socioeconomic situation. In their study Paderes, A.S; Lazaro, S.C.; Baltazar, A.G.; Ponce, A.R. said that the respondents considered their barangay [villages] halls very useful in serving as venue for meetings and as a source of information about their barangay and its residents.

This related literature is like the present project which included the collection of the barangay information and I agree to the author of this study that it is important to barangay to have a Barangay Information for an easy way of processing of their resident’s data and acquiring barangay certificates. To help every barangay for a faster and secured record keeping of barangay information.

Based on the study of Rosalinda B. Cruz (2004), In his study entitled Developing a Land Use Information System for Local Government: The Case of Naga City, Philippines. Their study is about to develop a land information system for Naga City to examines land use practices in local government with the view designing of a system to improve current setup. This has been achieved through analysis, design, and prototyping.

The finding above was related to the objectives of our proposed study. Although they have a different purpose however their system that they want to develop is about to the Land Use Information which want to store, maintain, integrate, and share data. To manage the permits, payments, and tax assessment of land information on Naga City. This study has a significant role on our study, our study is developing a Barangay Information System to store a barangay information which need to be in the barangay.

Features of Employees record management System

The study conducted by Sarroza et. al. (2013) revealed that customized web-based tool for Cioco, Cioco and Cioco Law Office would improve the office operations, increase productivity, reduce errors, and improve access to information. The developed system shall speed up the processing of clients' legal documents and cases, improves the law office business's handling of electronic files, and help office staff become more efficient and productive. The system is an Internet-based application tailored according to the office needs of the company. Also, the system provides a website to support the office operations of the firm.

Stallings (2012) defines file management system as a set of system software that provides services to users and applications in the use of files. Typically, the only way that a user or application may access files is through the file management system. This relieves the user or programmer of the necessity of developing special-purpose software for each application and provides the system with a consistent, well-defined means of controlling its most important asset. File management system aims: to meet the data management needs and requirements of the user, which include storage of data and the ability to perform the aforementioned operations; to guarantee, to the extent possible, that the data in the file are valid; to optimize performance, both from the system

point of view in terms of overall throughput and from the user's point of view in terms of response time; to provide I/O support for a variety of storage device types; to minimize or eliminate the potential for lost or destroyed data; to provide a standardized set of I/O interface routines to user processes; and to provide I/O support for multiple users, in the case of multiple-user systems.

Nations (2013) In computing, a web-based application is any application that uses a web browser as a client. The term may also mean a computer software application that is coded in a browser-supported programming language (such as JavaScript, combined with a browser-rendered markup language like HTML) and reliant on a common web browser to render the application executable.

Evaluation Tools for the proposed system

An electronic recordkeeping system must be able to: collect, organize, and categorize records; and facilitate the preservation, retrieval, use, and disposition of records. On integrity, the system must ensure the integrity of the records it manages and be able to: minimize the risk of unauthorized alteration or erasure of the records, allow only authorized personnel access to the records in the system, allow only authorized personnel to perform administrative functions such as creating or deleting directories,

altering the parameters of metadata fields, and assigning access rights. On retrieval of records, the system must retrieve records and be able to: permit easy retrieval in a timely fashion; ensure that records are accessible by individuals who have a business need for information in the records; provide a method for all authorized users of the system to retrieve desired documents, such as an indexing or text search system; and permit retrieval of both individual records and files or other groupings of related records.

Employee trust impacts job satisfaction and team performance, and managers should focus on building relationships based on trust and participation. Managers engage further with their employees and promote relationships and trust within the workplace by recognizing employee performance and accomplishments and listening to their ideas and concerns on a regular basis (Heller, 2012).

In the words of Kevin Smith (2012) records management can be described as a management control of records. Kevin Smith and others defined records management in three words; records management, broadly defined includes forms, reports, reproduction of written materials, filling retention microfilming and related issues”. Records management in its broadest sense concerns itself with the records creation distribution maintenance, retention, presentation, retrieval, and disposal.

Chapter 3

PROJECT METHODOLOGY

This chapter discusses the development of the proposed study which includes the software development methodology, the scope and delimitations, the data gathering techniques, and the sources of data.

Software Development Methodology

In the design and development of the proposed system, entitled "Web-Based Barangay Information System" for Barangay Zone 1 in the Municipality of Bulan Sorsogon. This system was developed to automate the process files of the barangay which provide efficient way of storing the barangay information and to help them reduce the manual process of paper works. It can help the barangay officials assigned in paper works for an easy way of organizing their barangay information. The researcher will be using the Rational Unified Process as the development model in developing the system. The Rational Unified Process enhances team productivity, by providing every team member a knowledge and serves as guide for the development of the project.

Figure 2.1 illustrates the overall architecture of RUP. This figure shows the lifecycle concept of RUP.

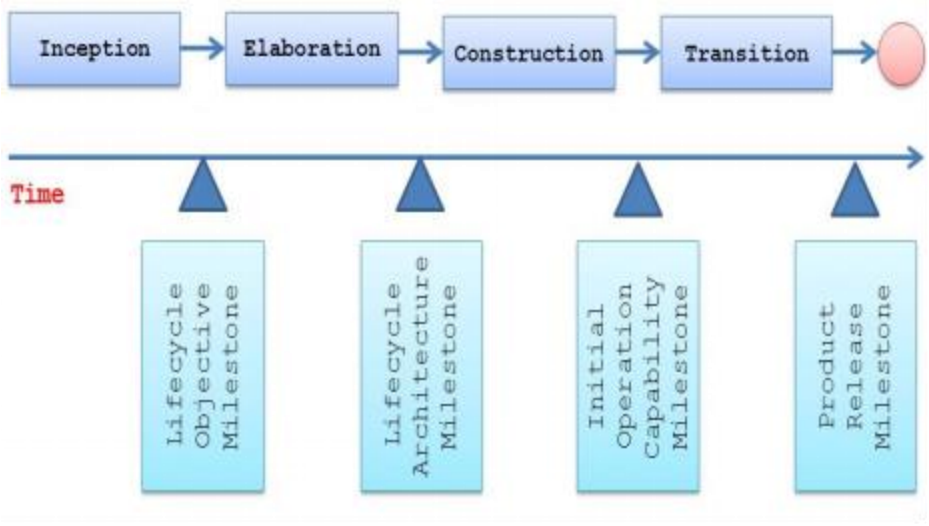

Figure 1 RUP Four Phases

The following are the phases of Rational Unified Process (RUP).

3.1 Development Model

The Rational Unified Process (RUP) Lifecycle is a software development process is based on enlargement and refinement of a system through multiple iterations, with cyclic feedback and adaptation. The system is developed incrementally over time, iteration by iteration, and thus this approach is also known as iterative and incremental software development. the iterations have four (4) phases which are Inception, Elaboration, Construction, and Transition. Each of these phases plays an important role in managing and for the development of the projects by using RUP. Each phase includes with a major milestone, as shown in figure 1

3.2. Inception Phase

The inception phase is the first and the shortest phase in the project. It used to prepare basis for the project, including preparation of business case, establishing project scope and setting boundaries, outlining key requirements, and possible architecture solution together with design tradeoffs, identifying risks, and development of initial project plan schedule with main milestones and cost estimates.

During the inception phase, my team determined the basic idea about what project were going to do and who is the client that would benefit for this project. The team will decide if this project worth pursuing and it used to prepare the necessary measures need for stablishing the system, including planning, outlining the project, and design. Determined how much the estimated cost and what is the resources needed to complete this project.

The Lifecycle Objectives Milestone of Inception phase is the following evaluation criteria:

- Determine the projects scope and boundaries
- Client Approval of the proposed project
- How much the estimated cost
- Risk of the development process
- Identify the use cases of the system
- Identify the hardware and software requirements

The inception phase is concluded by the lifecycle objective milestone. During this point, the lifecycle objective of the project is examined which my team decided either to proceed the or to cancel.

3.3 Elaboration Phase

Elaboration phase captures the functional requirements of the system. The main goal of the elaboration is to show the architecture of the system in the form of (use cases, system flow chart, class diagram, etc..), it's helps as to provide a stable basis for the design and implementation effort in the construction phase. Elaboration phase objectives is the following:

- Establish the architecture and requirements
- Establish a supportive environment
- Address all architecturally important risks
- Build a baseline architecture that will be used for the entire project

The Elaboration phase is concluded by the Lifecycle Architecture Milestone. During this phase my group team is determine the system requirements that needed for the construction of the project.

3.4 Construction Phase

Construction Phase is the largest and longest phase within Unified Process. The system will develop using the basis establish in the elaboration phase. The construction phase is divided into multiple iterations, for each iteration to result in an executable release of the system. The final iteration of construction phase release fully completed system which is to be deployed in transition phase.

Construction phase objectives is the following listed:

- Start coding the system
- Complete the analysis, design, development, and testing
- User Manual

The Construction Phase is concluded by the Initial Operation Capability Milestone. In this point the developer is starting of building the project and most of the coding is created.

During this point my team is decided if the system that build by our system engineer is fully completed and ready for the deployment which is in transition phase.

3.5 Transition Phase

The Transition Phase is the final project phase which delivers the new system into the user's environment. The goal of this transition phase is to make sure that the system is ready to be used. Transition phase objectives is the following:

- Fully completed system
- Product testing and Evaluation Criteria
- Alpha and Beta testing
- User's trainings

The Transition Phase is concluded by the Product Release Milestone. During this point my team making sure that the product is ready for the customer to be used and ready for the final evaluation and release. At this point the developers will completely developing the system and before it can release to the client and before it releases to user environment, we must conduct a testing to make sure that the system is fully functional and conduct an evaluation, the proponents and developers conduct a several testing and evaluation that support and relevant to the system to meets the needs of the respondents. To evaluate the system the proponents used evaluation tools which is the ISO 9126 Software Quality Characteristics, the proponents identified the 2 group of users to evaluate the system. The first group was composed 2 IT experts and second group was composed of end-user. The two (2) IT Experts is coming from Sorsogon State University which helped the researcher to identify if meets the user requirement and satisfaction and the user interface design, as well as to test the system. the second group of evaluators is coming from form our client which is in Barangay Zone 1 in the municipality of Bulan, these second group of evaluators is the Barangay Official and some residents of Zone 1. These 2 groups of user's evaluators were given a questionnaire based on the ISO 9126 software characteristics to test and evaluate the system.

The ISO 9126 software quality model identifies 6 main quality characteristics, namely:

- Functionality
- Reliability
- Usability
- Efficiency
- Maintainability
- Portability

Scope and Delimitations of the Study

The scope of this system is to provide an efficient and accurate Barangay Information System. It involved a database that store the data where in the Barangay Official that will assigned to manage and monitor the records of the residents. It also focused on securing the confidential records of the barangay. The development of this system will help the barangay official assigned to perform many operations such as add, update, delete and store data. It also performed the process of records complaints wherein it views and make actions to the solved and unsolved cases in the barangay. It can easily generate exports records of the residents into excel, it can create a clearance forms and issuances of barangay certificates. Lastly this system requires internet connection to work properly.

However, the limitations of this system are: It cannot perform the other operations such as the economy of barangay, it cannot open offline, the residents cannot access the system only

authorized user can access and the administrator is the only one who assigned a barangay official user, the system cannot share data to other databases and lastly it limits the other transactions within the other barangay because it only intended for the barangay zone 1 Bulan Sorsogon.

Data Gathering Techniques

The researcher used the following techniques for data gathering.

Interview. One of the most widely used data gathering technique that allows building a deeper understanding of the study. It covers several advantages on the side of the researchers like (1) Deeper insight of the study, (2) Accuracy of answers through correct interpretation of the questions, and (3) Physical presence improve the persistency and response rate. The proponents will be using the interview as a tool to gather some relevant information that needs to be in this study. The proponents will conduct interview to the barangay including the barangay captain, barangay workers, and the assigned staff about the processing of issuing barangay clearances, issuing business permit, issuing barangay indigency, managing resident's records, barangay official record, barangay cases and other barangay services.

Document Analysis. It consists of examining existing data in the form of databases, meeting minutes, reports, attendance logs, publications etc.; an inexpensive way to gathering information which is useful for development of the study. In this section, the system engineer determines and understand the tools that used build the program. He must also know the software as well as the required hardware and software, this requirement is a system engineer task.

Survey. It enables the researcher to obtain information by using survey forms (includes list of survey guide questions or evaluation) to the respondents. It is a form of inquiry document, which contains a systematically compiled and well-organized series of survey questions intended to elicit the information for statistical analysis. The proponents will provide a survey to the users it is used to know what we can improve to our system, and they are allowed to give us feedback of what is the user experiences or write what are the needs and don't to the system made by the developer. In this study we applied the ISO/IEC 9126 for conducting a survey to the respondents and ISO/IEC 9126 use questionnaire which tested and evaluated the system. It will be used to describe the operation of the system in terms of Functionality, Reliability, Usability, Efficiency, Maintainability and Portability.

Sources of Data

In this section the researcher will discuss some relevant sources of data that we gathered from the different organization to test and evaluate our system and it helps as to use the data for the development of our system. The source of data that we

gathered is from our client which is the Barangay Officials of Zone 1 Bulan Sorsogon and some residents. The Barangay official's is the Barangay chairman and Secretary is the primary user of the system.

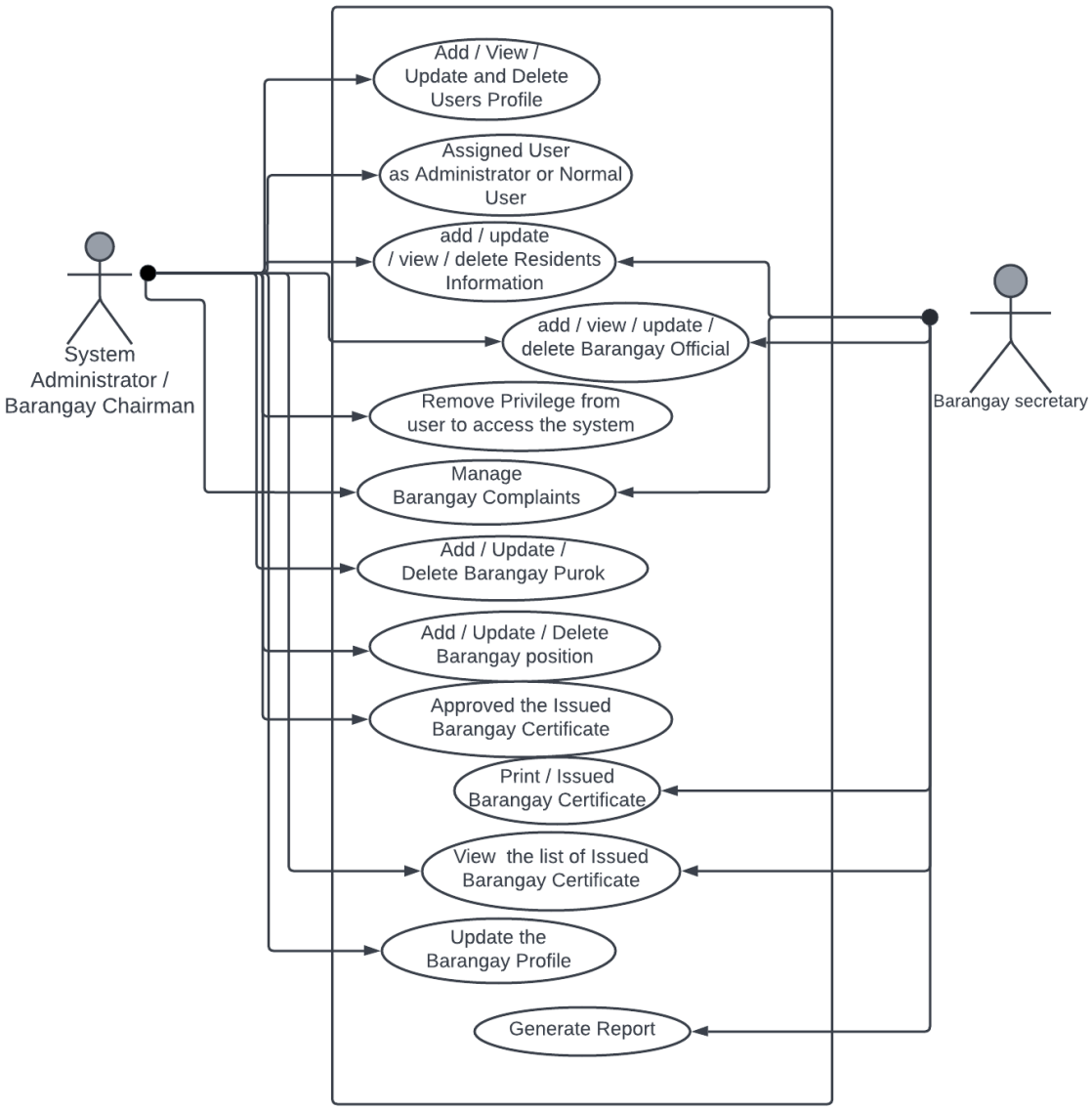

Figure 2 Use - Case Diagram of the Barangay Information System

3.6 Use Case Diagram

In Figure 2 shows the Use Case Diagram that shows the two (2) main actors of the system which is the Barangay Chairman and Barangay Secretary it shows the role of each actor on the Barangay Information System. The Barangay Chairman is the system administrator who manages the entire functionality of the system, and The Barangay Secretary will in-charge of the process of encoding, recording of the barangay resident’s information, issuing the approved barangay certificates, complaints, and barangay activities.

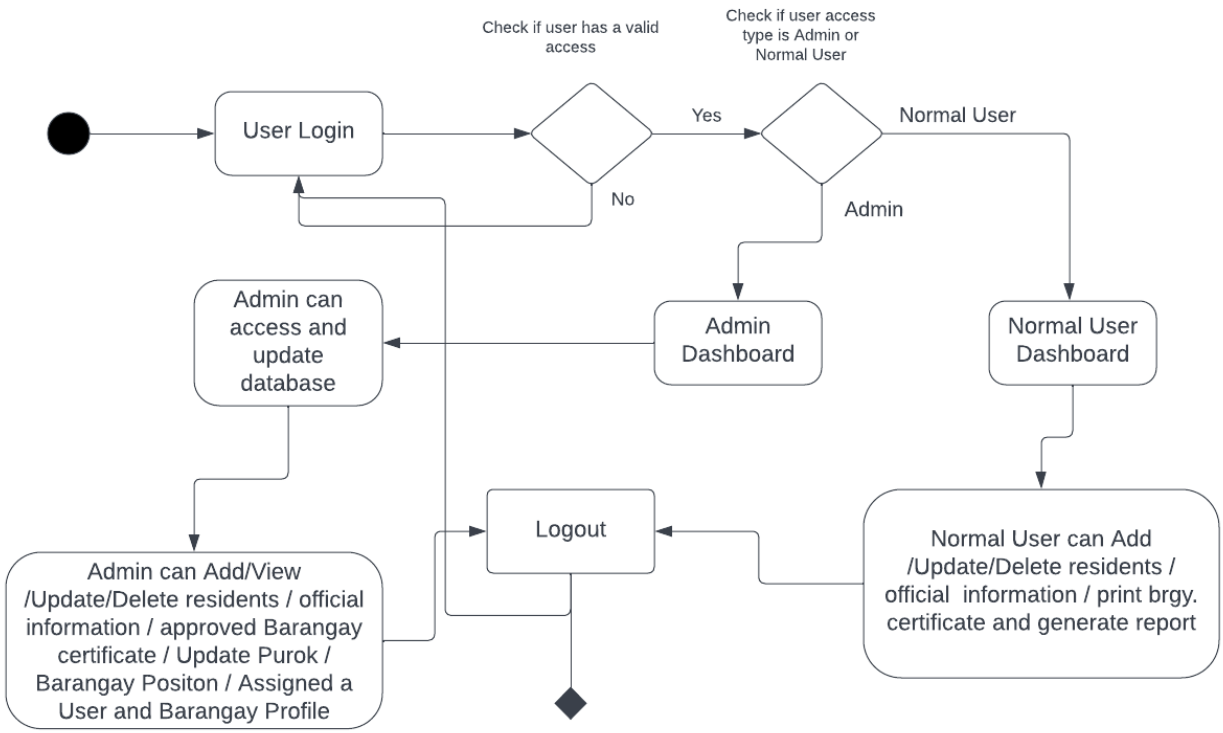

Figure 3 Activity Diagram of the Barangay Information System

3.7 Activity Diagram

In Figure 3 shows the Activity Diagram basically it shows the system flowchart that describe the operation of the system on how the user can enter to the system and the password and username is the only requirements to be login to the system, at first the user will try to login using there username and password and it will check if the user is administrator or normal user then if the user

have access he will redirect to the admin dashboard or in normal user dashboard and if the user don’t have account he/she will go back to the login form.

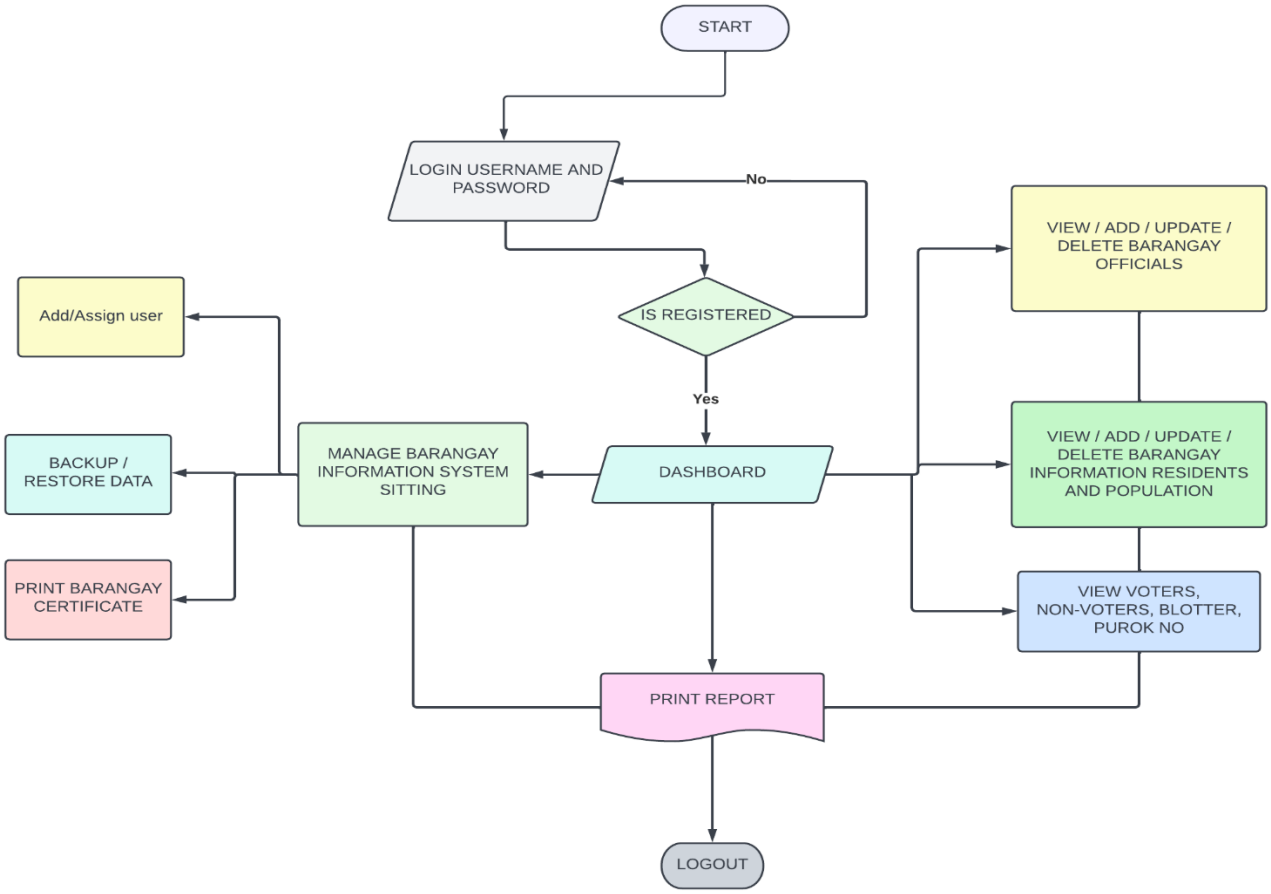

Figure 4 Administrator’s System Flow Chart

3.8 Administrator's System Flow Chart

In this Figure 4 show the flow of system. The system lets the administrator input username and password if it registered, he/she will redirect to the dashboard, and it will load all the module and operations of administrator in the system. The administrator has the authority to access the entire operations of the system including system sittings and assigned the role of the user if admin or staff.

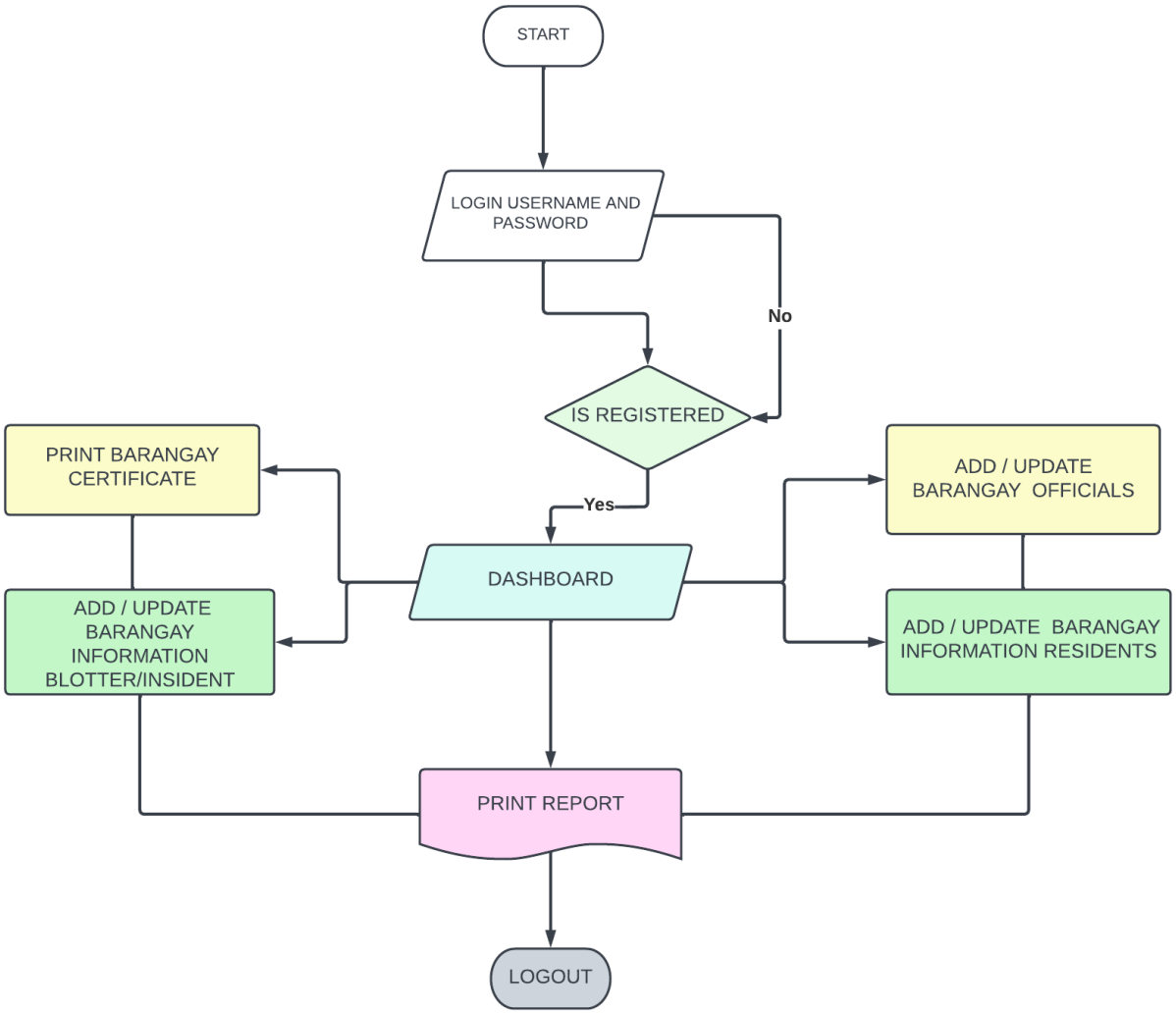

Figure 5 Barangay staff System Flow Chart

3.9 Staff System Flow Chart

Figure 5 shows the normal user flow chart it can be a secretary of the barangay or any barangay official's that assigned by administrator to help some barangay paper works. The system lets the barangay staffs to input username and password, it should be

validated based on data from the database, it will check the user privilege if the username and password is existed then it has found, it loads the Normal user dashboard and the basic operation which are add/update barangay official, add/update barangay residents, manage barangay blotter/incident, print reports.

4.1 UML CLASS DIAGRAM

Figure 6 on the next page shows the relationship of different classes of the barangay information system. The User, Barangay profile info, resident, brgy: official's, position, purok, payments, blotter, and permit are included in this class diagram. This diagram determines the process of the system and functions that was relevant to the system. This class diagram used to describe the structure of the system by showing its classes, attributes, and operations. It was generated from entity relationship diagram of the system database.

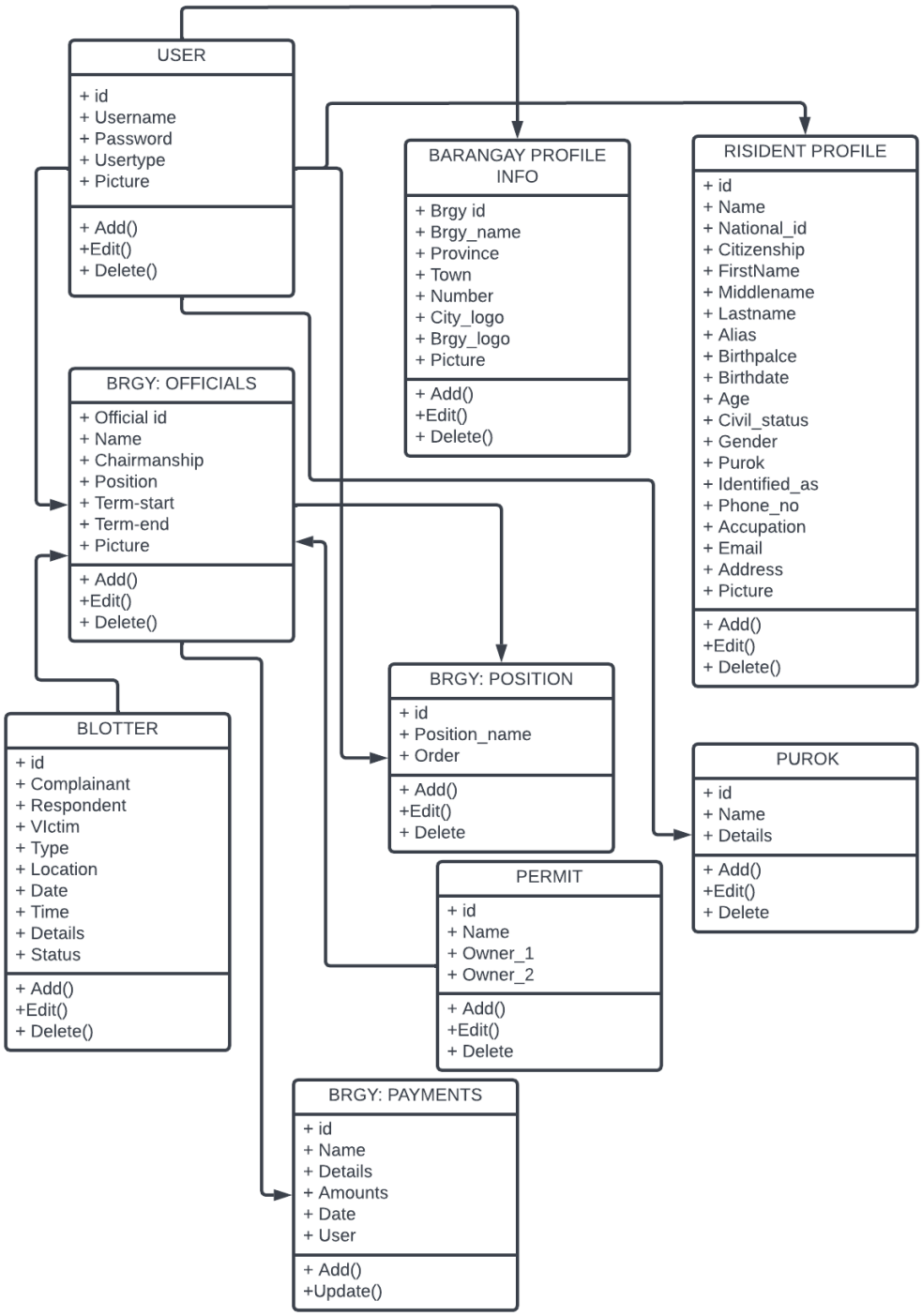

Figure 6 UML Class Diagram

4.2 Software and Development Tools

The researcher used the Visual Studio IDE for software development tools for building the system. This IDE has a complete featured which can help the developer to easily build the project, the Visual Studio IDE has a debugging tools feature for live debugging and has many extinctions that can use to make the developer have a good quality of coding the project.

4.3 Hardware Requirements

This hardware requirements refers to the tools that needs to run the proposed system, the following are the hardware are required for the end user. The user may choose either computer desktop or laptop, Table 1 presented below is the hardware requirements

TABLE 1

Hardware Requirements

Laptop/ PC	Intel Core i5 7thgen, 8gb RAM, 250gb SSD + 1tb HDD
Printer	EPSON L360

4.4 Software Requirements

This software requirements describes the tools need for the developing and to run the system, the developer used the Visual Studio Code as an IDE for building the proposed system, the frontend and backend use in the system is the table 2 below shows the following:

TABLE 2

Software Requirements

Category	Description
Operating System	Windows 10 or 11 32bit / 64bit
Database Engine	MYSQL
Web Server / Local Server	XAMPP Server
FrontEnd	HTML, BOOTSTRAP CSS FRAMEWORK
BackEnd	PHP, MySQL
Web Browser	It is use to run the system
Visual Studio Code IDE	text / code editor platform

HTML (Hypertext Markup Language) is the standard markup language used for the structure of the system to be displayed in the web-browser.

Bootstrap CSS Framework is use for building a responsive system and website, the CSS framework is having many features to make the UI responsive and free to use. Bootstrap has many new features HTML and CSS templates for UI Interfaces elements such as buttons, and forms etc. Bootstrap also support JavaScript extensions.

XAMPP Server is used as tool for running the system in local network, it helps the developer to test the websites via computer and laptops. It is a platform that furnishes a suitable environment to test and verify the working of projects based on Apache, Perl, MySQL database, and PHP through the system of the host itself.

PHP (Hypertext Preprocessor) is used as the backend for developing the system. It is a server-side scripting language that is embedded in HTML. It is used to manage dynamic content, databases, session tracking, even build entire websites. It can perform system functions such as create, read, write, open, and delete.

MySQL is a Relational Database Management System (RDBMS) that manage SQL. SQL is primarily used to query and operate the system. It helps to automate data retrieving and provide great support in PHP MySQL web application development. The developer used the MySQL for storing data, managing large volume of data that stored in the different tables and accessing the data in the database, also helps as to handle the data into the system database.

4.2 System Evaluation Criteria

To stabilize the Web-based Thesis/Capstone Project Barangay Information System successful functions, to evaluate the system the proponents, use the ISO/IEC 9126 as a software quality model. Each Characteristics have sub characteristics that define the main category as evaluation of the system software. For the Functionality, it has sub characteristics such as Sustainability, Accuracy, Interoperability, and Security. For Reliability, it includes sub characteristics such as Maturity, Fault Tolerance, Recoverability, and Reliability Compliances. For Usability it has sub characteristics such as Understability, Learnability, Operability, and Attractiveness. For Efficiency it has sub characteristics such as Time Behavior, Resources Utilization, and Efficiency Compliances. For Maintainability it has sub characteristics such as Analyzability, Changeability, Stability, and Testability. For Portability it has sub characteristics such as Adaptability, Installability, Co-existence, and Replaceability. Moreover, the plan where includes the system software designing and prototype model that determines the user interfaces and functionality of the entire system.

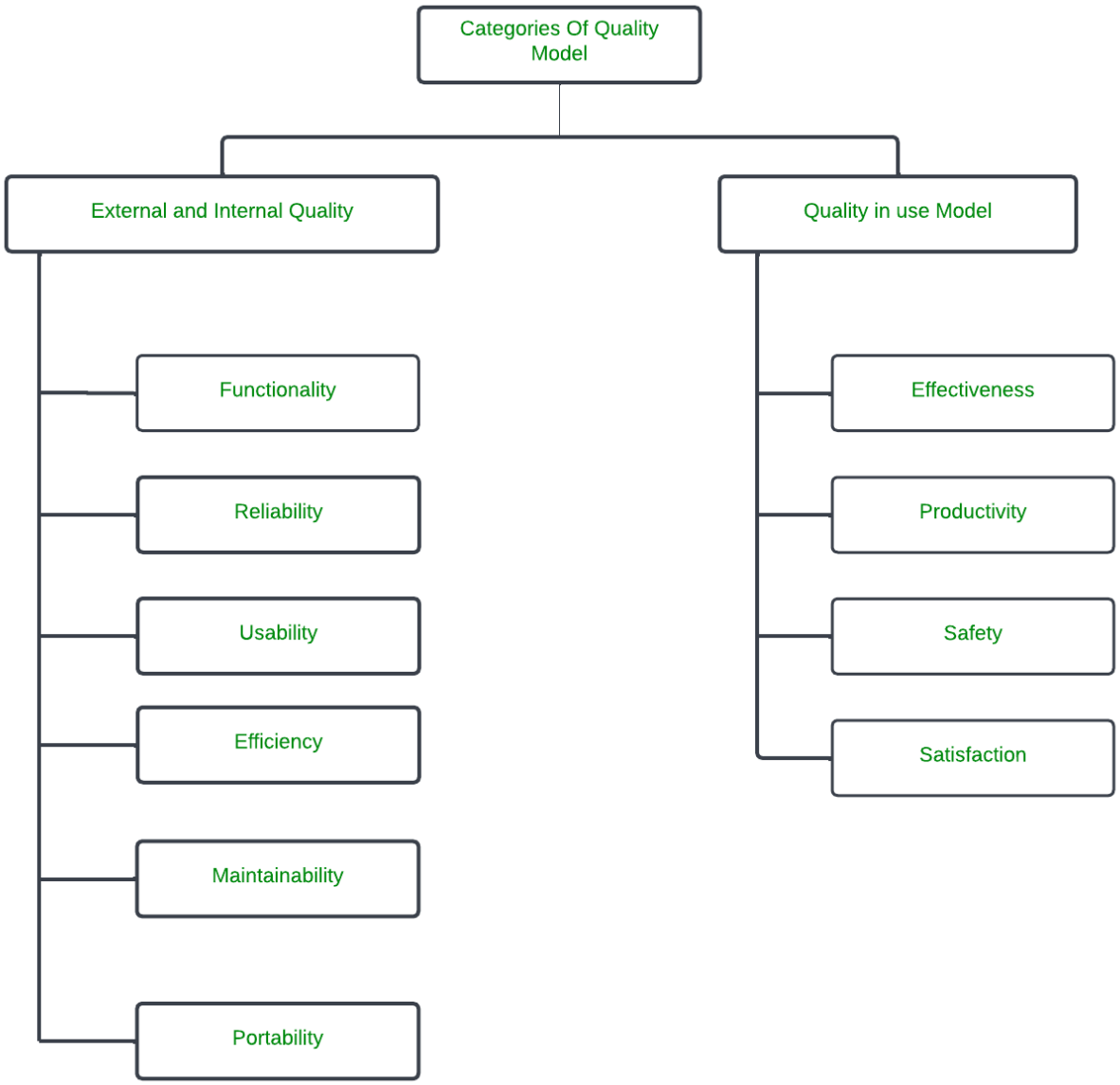

Figure 1.6 ISO 9126

The objectives of this system evaluations are to make sure that the system is fully functioned, and the feedback of this

evaluation can provide as a further change of what we could improve for to our system design and security, this will help as to identify the required software application and hardware for this system.

Functionality. A set of attributes that bear on the existence of a set of functions and their specified properties. The functions are those that satisfy stated or implied needs. This characteristic has a sub-characteristic namely as:

- Suitability: The capability of the software to provide an adequate set of functions for specified tasks and user objectives.
- Accuracy: The capability of the software to provide the right or agreed-upon results or effects.
- Interoperability: The capability of the software to interact with one or more specified systems.
- Security: The capability of the software to prevent unintended access and resist deliberate attacks intended to gain unauthorized access to confidential information or to make unauthorized modifications to information or to the program to provide the attacker with some advantage or to deny service to legitimate users.

Reliability. A set of attributes that bear on the capability of software to maintain its performance level under stated conditions for a stated period. This characteristic has a sub-characteristic namely as:

- Maturity: The capability of the software to avoid failure because of faults in the software.
- Fault Tolerance: The capability of the software to maintain a specified level of performance in case of software faults or of infringement of its specified interface.

- Recoverability: The capability of the software to re-establish its level of performance and recover the data directly affected in the case of a failure.

Usability. A set of attributes that bear on the effort needed for use and on the individual assessment of such use by a stated or implied set of users. This characteristic has a sub-characteristic namely as:

- Understandability: The capability of the software product to enable the user to understand whether the software is suitable, and how it can be used for tasks and conditions of use.
- Learnability: The capability of the software product to enable the user to learn its applications.
- Operability: The capability of the software product to enable the user to operate and control it.
- Attractiveness: The capability of the software product to be liked by the user.

Efficiency. A set of attributes that bear on the relationship between the software's performance and the amount of resource used under stated conditions. This characteristic has a sub-characteristic namely as:

- Time Behavior: The capability of the software to provide appropriate response and processing times and throughput rates when performing its function under stated conditions.
- Resource Utilization: The capability of the software to use appropriate resources in an appropriate time when the software performs its function under stated conditions.

Maintainability. A set of attributes that bear on the effort needed to make specified modifications (which may include corrections, improvements, or adaptions of software to environmental changes). This characteristic has a sub-characteristic namely as:

- Analyzability: The capability of the software product to be diagnosed for deficiencies or causes of failures in the software or for the parts to be modified to be identified.
- Changeability: The capability of the software product to enable a specified modifications to be implemented.
- Stability: The capability of the software to minimize unexpected effects from modifications of the software.
- Testability: The capability of the software product to enable modified software to be validated.

Portability. A set of attributes that bear on the ability of software to be transferred from one environment to another (this includes the organizational, hardware or software environment).

- Adaptability: The capability of the software to be modified for different specified environments without applying actions or means other than those provided for this purpose for the software considered.
- Installability: The capability of the software to be installed in a specified environment.
- Coexistence: The capability of the software to coexist with other independent software in a common environment sharing common resources.
- Replaceability: The capability of the software to be used in place of other specified software in the environment of that software.

The respondents of the study are the personnel of Barangay Zone 1 Bulan Sorsogon and IT experts. Table 3 summarizes the number of respondents.

Table 3

Summary of Respondents

Respondents	**No. of Respondents**
Barangay Chairman (Administrator)	*1*
Barangay Secretary	*1*
IT Experts	*3*
Total	**5**

4.3 Respondents

The evaluator's operation rated the overall functionality of the system, by conducting of system testing to provide further feedback to the developer. During this system testing the

proponents tested the system together with clients including the barangay chairman, barangay secretary, barangay residents, and IT experts.

Barangay Chairman. The role of the barangay chairman is the administrator who evaluates the entire system, which make provides the important data that entered the system database, and he has the overall control of the entire system.

Barangay Secretary. The secretary is the second user assigned by the administrator in the system, to help the administrator to assess and process the barangay data but his access to the system has a boundary some control cannot perform.

IT Experts. The IT Experts is an important respondent and evaluators of the system because he a good knowledge on programming, which can help as to know the errors and bugs. To know the needs and want’s further adjustment to the system and helps the developer to provide accurate discission making on what can he changes to the system before it can release on user environment.

REFERENCES

A. Books

Ambler, S. W. (2005). A Manager's Introduction to The Rational Unified Process (RUP). Ambysoft

Dijck, J.V. (2013). The Culture of Connectivity: A Critical History of Social Media. Oxford Uni. Press

Eeles, P., and Houston, K. (2002). Building J2ee Applications with rational Unified Process. Addison-Wesley Longman Publishing Co., Inc. Boston, MA, USA

Kelly Duggan, Publisher, Granite State College, (September 8, 20202). MGMT660 Capstone Guide

B. Web Articles

BICOL NEWS. (2016). [Television broadcast]:

Espineda, F. Jr. (2014). Retrieved from http://bicoltoday.com/2014/12/13/ndcc-honors-sorsogon-pdrrmo-as-bicol-regions-best/

IBM (2004). Rational Unified Process Home Page.
www.306.ibm.com/software/awdtools/rup/support/

https://www.google.com/

https://www.ques10.com/p/2303/iso-9126-quality-characteristics/

https://www.google.com/search/best+search+engine/

https://scholar.google.com/

https://academic.microsoft.com/

https://www.base-search.net/

https://www.semanticscholar.org/

https://scholar.google.com/

https://www.researchgate.net/search

https://www.studymode.com/

https://www.geeksforgeeks.org/iso-iec-9126-in-software-engineering/

https://lucid.app/documents#/documents?folder_id=home

C. Journals

Allen, C., Tsou, M.H., Aslam, A., Nagel, A., and Gawron, J.M. (2016). Applying GIS and Machine Learning Methods to Twitter Data for Multiscale Surveillance of Influenza. PLoSONE11(7): e0157734.doi:10.1371/journal.pone.0157734

Alves, A.L.F., Baptista, C.D.S., Firmino, A.A., De Oliveira, M.G., and De Paivaa, A.C. (2015). A Spatial and Temporal Sentiment Analysis Approach Applied to Twitter Microtext. Journal of Information and Data Management

Charina P. Maneja, Nancy A. Tandang, Merlyne M. Paunlagui, (2012). Determinants in Sustaining a Local Information System in the Philippines: the case of the Barangay Management Information System (BMIS)

Celia M. Reyes and Kenneth C. Illarde (1996), community-based monitoring system for poverty tracking (CBMS)

Maneja, Charina P. (University Knowledge Digital Repository, 2012-07-01), Barangay Management Information System (BMIS)

Celia M. Reyes and Kenneth C. Illarde (1996), community-based monitoring system for poverty tracking (CBMS)

Paderes, A.S; Lazaro, S.C.; Baltazar, A.G.; Ponce, A.R. (1999). Barangay [Village] Information System (BIS)

Rosalinda B. Cruz (2004), Developing a Land Use Information System for Local Government: The Case of Naga City, Philippines.