

WINDOWS-BASED INFORMATION MANAGEMENT SYSTEM WITH PROJECT MONITORING FOR BARANGAY

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Abstract— The purpose of this study is to develop and evaluate a web-based barangay Issuance System for barangays called the “Barangay Document and Issuance System (BDIS).” Researchers used a development research approach to design and develop the web-based Barangay Document and Issuance System (BDIS). The Barangay Document and Issuance System (BDIS) was created using the Rapid Application Development (RAD) approach of the Systems Development Life Cycle (SDLC) and evaluated by IT professionals, IT practitioners, and barangay stakeholders. The acceptance of the created system was evaluated using the System Usability System for system evaluation. The average score for all participants who evaluated the system was 4.58, which translates to “strongly agree.” The Barangay Document and Issuance System (BDIS) was rated acceptable because respondents liked it and found it convenient and easy to use. Barangays will benefit from this system to reduce administrative work and process document requests. It also functions as a database of barangay records by implementing and using the Barangay Document and Issuance System (BDIS).

Keywords— *barangay document, rapid application development, system development life cycle.*

I. INTRODUCTION

A barangay is known as the most basic political unit in the Philippines. It is the community's dominant planning, organizing, and executing unit for public policies, programs, projects, plans, and activities. It is also a venue for the

collective opinions to be communicated, articulated, and discussed and to handle conflicts benevolently [1]. It is in this unit where countless records, files, and legal documents are compiled, organized, and safe-kept traditionally, using pen-and-paper, logbooks, folders, and cabinets. An automated barangay information system is ideal for barangay officials and personnel who can have direct access to barangay citizens' profiles [2]. The vital role of the barangay officials in the community is to assist citizens with their needs. When barangay residents and non-residents request a barangay clearance, cedula, or other legal documents, barangay officials must assist and provide the inquired certificate or document in the shortest period possible.

Additionally, the planning of barangay projects needs to be recorded or documented accordingly for proper and organized documentation. To enhance and strengthen public service, public authorities at all levels, from the national to the municipal level have decided to embark on document computerization and transaction integration [3]. Therefore, barangay officials must respond to their respective clients' needs. This includes their own barangay needs supplied by the information management system to enhance the productivity and efficiency of both the software system and the organization.

It is fundamental to produce a structured and essential information management system with the support of information technology, commencing from the most basic to

the most complex aspect. Furthermore, each organization's use of an information management system varies significantly, with software and hardware tailored to each organization's needs, progressing from collecting details, accessing, processing, and storing the data, to transmitting the information [4]. The development team decided to develop the BMIS to help in the promotion of competent service and transparency by the barangay officials, meeting the demands of their residents, and non-residents, and mitigating the traditional method of recording and managing barangay information. This proposed system utilizes the conventional approach of record-keeping barangay records and reports and pre-filled document requests for barangay residents or non-residents and barangay project filing. In almost every organization, data and information are essential. It is necessary to develop acceptable methods and approaches for storing, retrieving, and processing data traditionally written by hand with the mere fact that there is an increased collection of data and generation of information [5].

Various studies and developed information management systems for barangay have been published and implemented. These systems are primarily used in barangays, related industries, local government units, and other government or private bodies. One of the existing system's functions and features includes automating the management of barangay primary residence, and demographic, and establishing geotagging of products and goods for barangays. To locate the commodities accessible by the barangay, it will use the Google Map Application Programming Interface (API). Moreover, barangay officials can efficiently monitor the status of the community to provide a suitable response, without having to travel to every house to collect data [2].

The Barangay Information Management System (BIMS) is a proposed Windows-based software program that will automate the traditional process of record-keeping. It promotes the safe keeping of the barangay records, barangay files, information, and documented session details. Most importantly, it enables the processing of pre-filled document requests for legal documentation or certificates. The Project Module of the BMIS also allows for documenting barangay projects.

The project's primary objective is to provide a Windows-based Barangay Information Management System to assist barangay officials in responding to the needs of their clients. Services needed by the barangay such as storing, organizing, and retrieving barangay records, documentation, and pre-filled document requests are also catered to by the proposed system. Exclusively, the project module of the proposed system monitors and manages the barangay projects. It comes with a dashboard displaying the summarized project list, details, status of barangay projects, the total budget for the undertakings of the barangay, and the count of barangay projects per month or in total.

Despite the divergence in political structures, civilizations, industries, and developmental stages, countries worldwide are now paying close attention to e-governance. In this shift, e-governance is generally understood as using information technology to better administer public affairs, provide the

public with higher quality services, and establish more equitable democracy and good governance [6]. Thus, this research study and the proposed system are essential to the barangay offices, especially the Barangay Ugac Sur. BIMS will enable them to improve operational barangay services, like retrieving, managing, and storing multiple and wide-range barangay records, providing pre-filled document requests, and the barangay project documentation that boosts budget transparency and openness of barangay projects to all authenticated and verified employees.

II. RELATED WORKS

This chapter highlights the developers' broad and in-depth fact-finding relevant to the proposed study, Windows-Based Information Management System with Project Monitoring for Barangay. The listed various related literature and substantial studies in this chapter focus on data about those existing information management systems and transaction management for barangay, comparable features and functionalities, and pros and cons. Hence, this serves as the guide for the development team as they work on the project and study.

The web-based barangay information system for the overall objective is to develop a web-enabled information system for the barangays of Davao Occidental, particularly the barangays of Malita. The Web-Based Barangay Information System then assists the Malita community in maintaining organizational efficiency and obtaining beneficial solutions from the municipal authorities whether any situations arise in terms of demographic, residences, or commodities in each Sitio [2].

The Barangay Management System, also known as e-barangay, is a web-enabled management approach that aims to transform barangay management from a traditional to a citizen-centered system. Its primary goal is to simplify established administrative operations such as requesting papers, voicing concerns, and obtaining appropriate and accurate barangay data [6]. In developing the existing system, E-barangay, the research team employed the prototyping software development approach. As expressed, this method evaluates the specifications of the clients and the viability of design considerations rapidly. Before its implementation, clients can interact with the system already, which allows them to fine-tune the specifications.

The information system development based on knowledge management in higher education Institutions aims to convey the perspectives, thoughts, priorities, and information technology used to construct management information systems in a higher education institution. The emergence of information systems based on knowledge management in higher education institutions serves as the unit analysis for this study's emphasis [7]. This research ensures maximum future development by empowering the knowledge of the study program from informants such as the coordinator, instructors, participants, and former students by emphasizing a study program information system analysis based on knowledge management, a study program information system design based on needs analysis and a study program for information system development based on information technology [7].

The education management information system or EMIS for Kitinga Primary School in Mwingi Central – Kenya was developed to assist the planning committee and executives more efficiently and successfully in organizing and administering the educational system. It promotes a good pattern in institutions that promptly provide appropriate reports. Additionally, the stated functionality of the EMIS is a vital process for recording, organizing, saving, obtaining, modifying, and extracting current information necessary for controlling schools' everyday operations. This makes it easier to follow up on routine concerns necessary for optimal school planning and improvement [5].

The Web-based Barangay Information System for Brgy. Mangga San Isidro and Nueva Ecija improved daily office tasks and administered documentation inquiries. This e-Barangay can also act as a database for local barangay statistics [8]. The developers of the system utilized the generic SDLC research methodology, starting with this existing study's cons. Started from the planning stage down to the installation or deployment of the e-Barangay system. Researchers of the existing study also let the LGUs of barangay Mangga and IT professionals assess their developed system concerning ISO 9126, which asserts to critique the system's Functionality, Reliability, Usability, Efficiency, Maintenance, and Portability. Moreover, the result of the evaluation shows that IT specialists and barangay officials gave the e-Barangay an exceptional index score to all the corresponding quality criteria of ISO 9126 Quality Standards.

The rural health unit record management system with data analytics for Municipality of Bay, Laguna. aims to establish and assess the Rural Health Unit or RHU Record Management System that will aid in the better management of patient documents. The descriptive design was used in this research. As a result, the study employed a score assessment sheet based on ISO 25010, which evaluates the software quality of systems as determined by professionals through evaluation [9]. It is substantial that the developers' research study runs within two research designs, Developmental Research Design, and Descriptive Research Design. This strengthens the capability and compelling of the system towards its primary goal of giving software quality to the RHU. These research designs are incorporated to determine the overall sample of the research study, the researchers performed an initial interview session with staff of the RHU in Bay, Laguna. Then, quantify the statistical number of respondents.

The Online Examination Portal is a web-based software solution that enables participants to smoothly complete an online examination without necessarily spending hours grading the submitted paper. The portal's ultimate goal is to systematically assess participants with the utilization of a fully automated method that yields speedy results [10]. This system sends documents to students when they want them, and there is no need for extra equipment like pens and paper or other such items.

A study examines the basic principle of sustainable government from several aspects, resulting in a model that can be used to compare unsuccessful economies and political organizations to viable economies and political bodies. The

concept revolves around public officials' and governing bodies' responsibilities to address the demands of the public rather than certain sections of society. Also referred to this research study is that to help local authorities target suitable and proactive actions for alleviating poverty and quality of life, implementing an efficient local monitoring system for local government units is probable [11].

Researchers in a previous study [12] bring into effective action this study to comprehend and grasp new terminologies that are connected with the development and study of the Windows-based Barangay Information Management System. This study claims that a system must be required to allow documenting and monitoring of fundamental activities of transactions in the course of day-to-day industry operations, just like in barangays. Thus, this study is of excellent quality since it has undergone data collection methods, system development methods, and cited studies that will also benefit BIMS relevant to Management Information systems (MIS), Transaction Processing Systems, and sort of ideas regarding MySQL.

III. METHODS

A. Generic Software Development Life Cycle Model

The fundamental goal of Software Development Life Cycle Methods (SDLC) is to endow a framework for software development procedures and processes, along with a context for software quality. SDLC plays a vital role in the detailed analysis of this increasingly complex process into diminutive subtasks, which aids in the planning and monitoring of work, as well as the support of cooperation and communication among the various people and groups involved, and the assurance of the quality of the developed product [13]. Thus, this refers to the processes or cycles undergone either by enhancing the existing project or by proposing a new information management system, along with signifying rules and procedures that necessarily go with it. It predominantly entails methodical stages that adequately classify the task into segments such as Planning, Analysis, Design, and Development, including Testing and Implementation. The core idea of quality assurance and client satisfaction runs across these SDLC phases. The project team aimed to deliver and implement high-quality systems or software for end-users and clients [14].

B. Development Process

The planning phase starts by formally initiating the project or the proposed system by preparing a system request. This system request consists of elements such as the project sponsor, business need, business requirements, business value, and the unique issues of the proposed system. The development team prepared the said document entailing the business objectives for developing the software system and the expected QoS and advantages that the system will deploy to the office of the barangay. This document also provides the initial system features and functionalities of the system. An information management system is defined as a vital technique for gathering, processing, storing, retrieving, updating, and extracting up-to-date data that is fundamental for regulating

school operations [5]. Towards imparting transparency and competent service by the barangay officials, meeting the demands of their residents, also non-residents, and mitigating the traditional method of recording and managing barangay information, the development team then seeks to implement an Information Management System for the barangay. This system operates not only by utilizing automating the traditional method of record-keeping barangay records and reports but also the pre-filling of the document requests of either the barangay resident or non-resident and filing of barangay projects. After this, the development team proceeds with feasibility analysis documentation, specifically the Technical Feasibility. It assesses and determines the developers' ability to design and develop the system and the target client's willingness to provide the necessary software applications and hardware devices to process transactions and other barangay services that the system will provide. According to their technological acquaintance, a preliminary interview session with the end-users was also made. Lastly, the developers provided the Requirement Determination. It is to refine the high-level business requirements from the system request into more comprehensive and exact details of requirements to use as inputs for the new system, which needs to be accomplished to achieve the required quality and comfortability of the target clients. Functional and Non-Functional Requirements categories are the specific documents provided.

The analysis phase is where the gathered information needs of both the end-users and the developers were validated and analyzed in specific detail through the interview sessions at the barangay office with the Barangay Captain and the System Administrator. Together with observing, considering, and noting the barangay's current scheme in managing, organizing, and retrieving barangay records, processing requests documents, and their available software and hardware system present in their office, in short, the Functional Requirements, the so-known depth part of the analysis phase.

The design and development phase is where the creation of the proposed system's system architecture and the user interface eventuates. Also, the application of the actual programming/coding of the proposed software system takes place in this phase, together with accomplishing the requirement analysis, particularly Non-functional requirements. Moreover, the final design, modules, and functionalities of BIMS must meet the needs and standards of the client. To successfully meet the user requirement specifications and expectations of the respective end users, the barangay officials proposed the Windows-based software system, the Barangay Information Management System. The developers utilize MySQL Server and Workbench, Visual Studio C#, and Crystal Reports for the system design and development. The aforementioned developmental software system programs are chosen and used for their high-quality standard performances.

MySQL Workbench has a lot of functionality, and the general quality of the application is outstanding [15]. The tool uses standard visuals and charts, guidelines, and notations in creating database diagrams. The table creation and editing work as expected.

The key benefit of Visual Basic Studio is that the developer or designer may preview and examine live updates in the IDE without needing to leave the Studio and execute the application independently [16]. Users may drag the contents of the window around with the mouse, and the software application will organize everything for the user's benefit. Moreover, with the utilization of Crystal reports in Visual Studio. Crystal reports manifest powerful report creation, integration, and delivery tools to save time. As well as without leaving the Microsoft Visual Studio programming environment, the developer or designer can create rich and interactive reports. It also increases sustainability with various capabilities for Windows and Web applications and more.

Therefore, the manifestations as mentioned earlier, and related literature indicate and strengthen the implementation of the Barangay Information Management System. This software system can enhance the productivity and efficiency of its end-users.

With the growth of emerging technologies, information is now extensively produced with a dashboard or graphical illustration for users to easily understand different aspects of reports, especially with quantities and record monitoring. Accordingly, keying in loads of information into the dashboards and computing numerous data from the week's activities saves time and reduces errors. In addition, dashboards for project status should be established as a standard method for monitoring, managing, and reporting project progress [17]. The developers incorporated project monitoring in the system to document every project proposed by the barangay officials, unlike traditional services that the users were accustomed to. The system is incorporated with records that can be generated directly from the database to the document request module, ready for printing. Moreover, transaction history, immediate updates of residents and projects dashboard, and the sessions module that includes easy upload of minutes of the meeting are included.

Before implementing the system, the developers underwent testing using the USE questionnaire with the clients, including the Barangay Captain, other associated Barangay Officials, a Barangay IT Assistant, IT Practitioners, and IT Government employees. The USE Questionnaire, which consists of four variables such as usability, ease of use, ease of learning, and satisfaction, is used to assess usability. It comprises thirty questions with four potential Likert scale options [18]. On that account, the testing phase reckons whether all modules and functionality requirements were fulfilled and are in action. The development team conducted this usability evaluation with the support and participation of the target clients to determine and ensure that the BIMS is functioning according to the components of usability or usefulness, user satisfaction, and ease of use.

C. Modules and Functionalities

The so-known home page or the main page serves as the landing point of the Barangay Information Management System. Once the user or barangay official successfully incorporates its login details and the system validates, this page shows off. Behind the idea of adding this module is that most currently existing systems have this opening interface which

entails different features, images, and descriptions. Every developed program's homepage is referred to as the "front door." As a result, the first impression of a homepage is significant in enticing or repelling users [19]. Herewith, the proposed Barangay Information Management System displays the overview of the certified Vision, Mission, Service Pledge, and Barangay Organizational chart of a barangay.

The My Profile module displays the profile details of the barangay official who logged in to the system, such as First Name, Middle Name, Last Name, Suffix, Sex, Civil Status, Birthdate, Home Address, and Contact number. Edit Profile and Change password functionality are present and available in this module. This is to ensure that the details of the elected officials of the barangay are up to date, along with the idea of initiating account security. Thus, only the authenticated user can manipulate this module and its functions.

In the Barangay Officials module, the list of elected barangay officials is in view, specifically the name of the barangay official, their position, and the induction date. Search functionality, adding an employee by supplying the Employee ID Number, induction date, and position code with an index of legends, viewing the full recorded profile details, editing the personal information that is necessary to be updated, and archiving an idle record of the barangay official. All of these are accessible in this module.

The Residents module comes up with a dashboard that presents the chart of residents per classification (Children, Youth, Senior citizens, Indigent, Persons with Disabilities, and Not Classified). Also, the total barangay population, the number of recorded male and female residents, a summary list of residents, and the see all button. As soon as the See All button triggers, it will show off the master list of barangay residents, such as their name, sex, classification, and address. This module also has the functionality of adding residents, viewing, editing, and archiving a resident record or information. Additionally, filtering according to the street, classification, and sex, as well as the search feature, is included. The Residents module is incorporated as one of the components of BIMS because this will eliminate the count of missing resident records and the usage of the traditional method or pen-and-paper method to secure everything. And it reduces the time in locating and providing needed detail of an occupant. On top of that, to have an organized and updated master list of residents. In essence, this component of BIMS will suffice the requirements of the client and its primary purpose.

A dashboard also emerges in the Projects module. It displays the chart for projects per month, the all-out number of projects, the annual budget for projects, the status of the project (Archived, Completed, ongoing, Not yet started), and a summary list of the barangay projects. Also, there is a See All button when clicked, and each one of the lists of documented projects will appear. The same corresponding features of the other modules are also integrated into the projects module, which is the view – to view the details of the project such as Project ID, Project Title, Proposed start date, Target end date, Location, Budget, and status, editing – for updating but not all fields opt for editing to secure the authenticity of the record,

and archive functionality. Corruption and concealment are parallel with each other. Proper record-keeping management is required, which involves transparency throughout the cycle of a document and information to combat administrative obscurity. The more competent government agencies are to prevent hazards that may conceal corruption cases, the more openness they will have in all aspects of program management [16]. Consequently, the development team decided to have this new and distinct module of BIMS since its primary purpose is to have a transparency measure between the officials of the barangay and the Barangay Captain.

In the Sessions module, the minutes of the meetings, agenda, and remarks can be uploaded and recorded right after the meeting session of the barangay officials, visitors, and other staff to observe the proper forum. Thus, only authorized users can add new session records, view, and edit the session information, and upload a file in the format of PDF, Excel sheets, and Word documents. Moreover, this module also included archiving a session report and search functionality.

The dashboard incorporated in this module displays the legal documentation and barangay certifications that residents and non-residents can request and acquire straightforwardly. Counts of claimed requests and pending requests is also a feature of this module, plus the involvement of transaction history wherein the name of the person, assigned number of a document, purpose of the request, and the date and time of the person who requested such document are indulged in this feature and recorded accordingly. Moreover, policies of the barangay office regarding requesting documents are also present in this module.

The Activity Log module is only visible when the system determines and verifies that the user logged in is the system administrator or the IT Assistant. The assigned ID No., the activity of the user from the time of logging in until logging out, and the date of the actions taken are listed and visible here. Thus, only the system administrator can delete the entire logged activity of the user. The activity log module is incorporated to ensure that the actions of the users show a proficient elected barangay official and assigned staff for transparency purposes.

D. Use Case Diagram

The Barangay Information Management System has thirty-six (36) use cases as shown in Fig. 1, including the Login and Logout to the system. There are only two actors present: the system administrator and the user, the barangay officials.

Both the system administrator and the user can: log in to the system; view the list of barangay officials, own profile, resident's dashboard, projects dashboard, list of sessions, list of documents, and archives; and log out to the system. However, only the system administrator can perform the following: register a barangay official, edit a barangay official information, archive a barangay official account, view an activity log, and clear an activity log. To further explain, the developers used the extend and include in the illustration since some use cases can expand their capability with another use case or implement another use case. Therefore, as shown in the diagram, the view list of residents is already included in the

view resident's dashboard. Upon viewing the residents' dashboard, they can also search, view, add, edit, and archive resident records. Next, the view list of projects is already included in the view projects dashboard. Upon viewing the project's dashboard, they can also search, view, add, update project status, and archive a project record. Upon viewing the list of sessions, they can also search, view, add, edit, and archive a session record. Lastly is the view list of documents in which, upon viewing, they can also perform the request, add, and view the document.

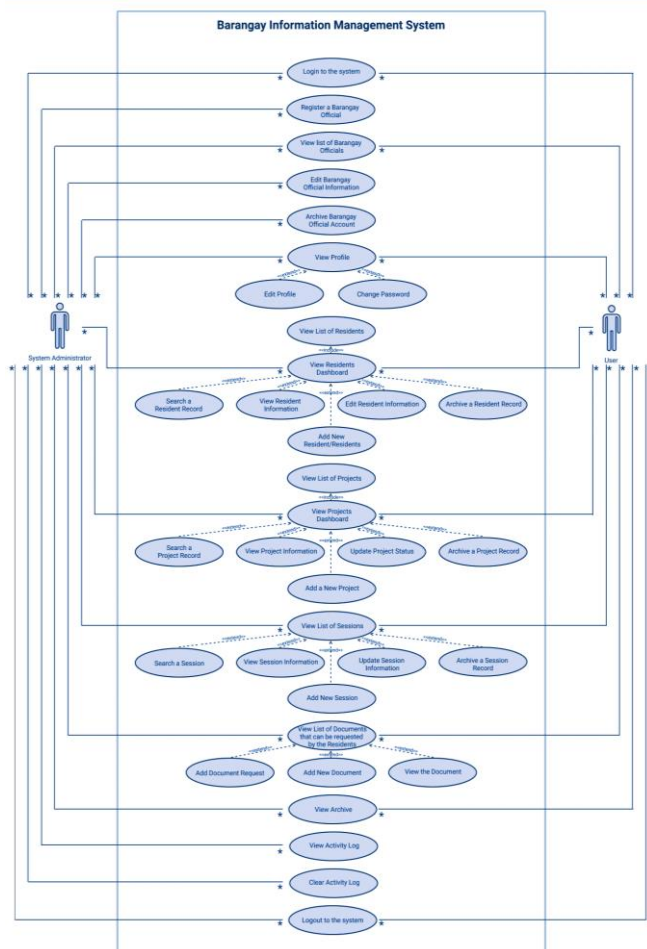


Fig. 1. Use Case Diagram of the System.

E. Dataflow Diagram

The data flow diagram in Fig. 2 depicts two external entities representing the system users who will engage with the system. The barangay official and the system administrator are the two entities. This diagram also illustrates the different outputs of the system following the inputs coming from the two stated external entities. Both entities hold the same log-in feature in which a valid credential is a must.

The barangay official could view either profile information, barangay officials list, resident dashboard, project dashboard, session list, document list, or archived list, and print out the document or certificate of the requestor after entering all

details and data into the system. On the other hand, the system admin can also utilize the same functionalities as the barangay official. Only the system administrator can update all details provided and can access the activity log of the barangay officials. Also, only the system admin can view and clear the activities done in the system.

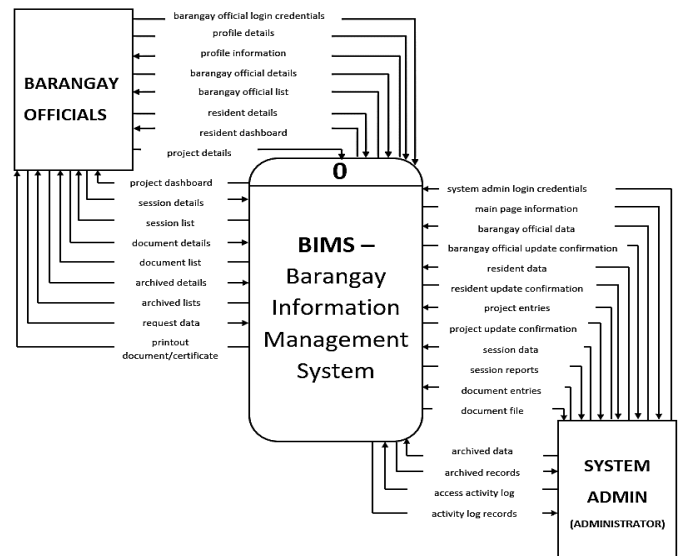


Fig. 2. Dataflow Diagram of the System.

F. Evaluation Tool

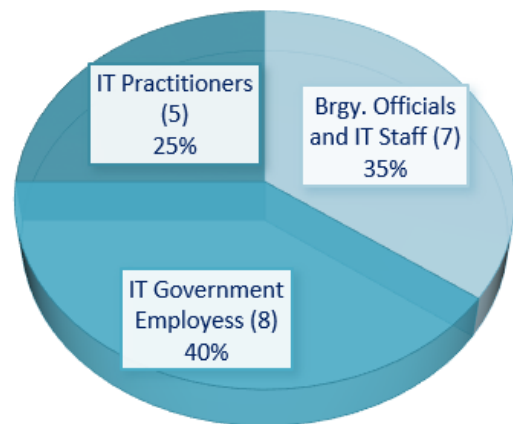


Fig. 3. Distribution of Respondents.

The developers used the USE questionnaire and Likert scaling scheme. The corresponding testers are the target clients such as the Barangay officials, precisely the Barangay Captain, IT Staff appointed as the System Administrator, Barangay Kagawads, IT Government Employees, and IT Practitioners. The testing assesses the Barangay Information Management System (BIMS) following the three indicators (Usability/Usefulness, Ease of Use, and Satisfaction). Moreover, there are a total of twenty (20) testers, and below is the count per assessor as shown in Fig. 3.

The development team visited the Barangay office of Ugac Sur. After implementing, presenting, and testing out the proposed system, the proponents asked the barangay officials

to weigh and evaluate the BIMS through the three indicators and to indulge their commentaries accordingly. Moreover, there is a schedule of a virtual meeting between the IT practitioners and the development team to have a presentation and demonstration about introducing the full functionality of the proposed information management system for the barangay, followed by an evaluation. Lastly, for the IT Government Employees to assess the BIMS, the developers went to the respective workplaces of the employees. The same process goes along with presentation and demonstration, trying out the system, and followed by evaluating it. The development team receives commendations from the testers.

The respondents are grouped into three categories: Barangay Officials and staff, IT Government Employees, and IT Practitioners. They tested the Barangay Information Management System's features and functionalities. To determine the perception of the testers invited, the responses were calculated and summarized through the mean value to simplify the interpretation of the results. The overall response regarding Usefulness, Ease of Use, and Satisfaction was statistically treated following the five-point Likert Scale and interpreted using Table I.

TABLE I. VERBAL INTERPRETATION OF FIVE-POINT LIKERT SCALE

Range of Mean	Verbal Interpretation
4.21 - 5.00	Strongly Agree
3.41 - 4.20	Agree
2.61 - 3.40	Neutral
1.81 - 2.60	Disagree
1.00 - 1.80	Strongly Disagree

IV. RESULTS AND DISCUSSION

A. The Developed System

For every application, it is necessary to implement a user-centered design to eliminate costly mistakes and misunderstandings in the system [17]. The Barangay Information Management system has a user-friendly design desired by the system's users. To utilize the Barangay Information Management System, the authorized system administrator must first register all the users by entering their registered credentials on the system's login page. After logging in, the system will direct the system administrator to the BIMS home page.



Fig. 4. Barangay Officials module of the System.

In Fig. 4, the interface of the Barangay Official's module is shown. The logo located on the top left corner of the page reinforces the official seal of the barangay, which is more likely, the norm and what users expect for the usability of the system [20]. The system administrator and the user (barangay official) can view the general profile details of all the barangay officials. Only the system administrator is capable of updating the displayed information. This module includes search functionality, viewing, editing, archiving, and adding new employees. Meanwhile, the navigation pane is located on the left, more likely, a vertical list for smooth and consistent [21] transitions of the users to different modules.

The user must first select the Add Employee button when adding a new employee. After that, the user will input the required details into the system, and the system will check if the data entered is permitted. The system will open a connection to the database and add new records in two tables named Employee and PE. After that, the system will evaluate if the form already exists or not. If not, the system will display a successful message box and close the connection.

When the user wants to edit an employee record, the user must first select the edit icon with the same row as the selected employee. The system will get the employee ID number of the selected employee and open the connection to the database. The user will edit the necessary details, and the system will update the information. The user will be directed to the list if the edited data are correct.

The user must click the archive icon with the same row as the selected employee to archive an employee record. The system will get the chosen employee ID number and move the record to the archives, and the system will also display a successful message box.

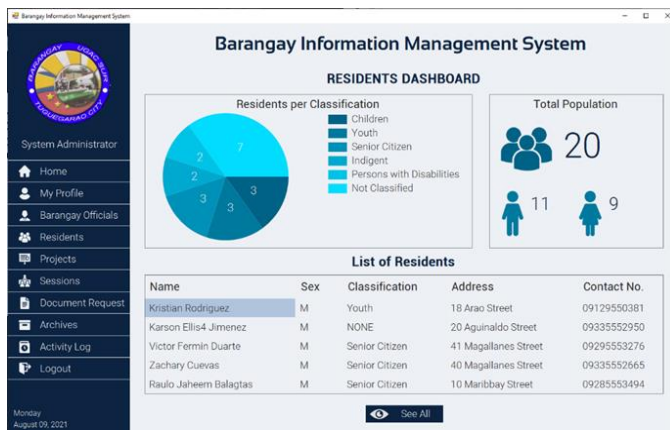


Fig. 5. Residents Dashboard of the System.

The displayed residents' dashboard in Fig. 5 comprises a dashboard where the system administrator and barangay official can view the master list of residents, the percentage of residents per classification, and the total population per sex. The dashboard is a logical grouping where everything displayed is based on the viewers' interest and attracts the viewers like an executive intranet [22]. Additional features like displaying, editing, archiving profile details of the residents, searching, sorting, and filtering resident records are incorporated in this module. Only the system administrator is authorized to edit all data fields of the resident's records, but both users and the system admin can add new resident information.

The residents' dashboard and a list are included in the residents' module. When the Residents' menu is clicked, the system will open the connection to the database and initialize the pie chart and the population count. The system will also get the list of residents from the database with a limit of 5. After which, the column headers are arranged and initialized with table format.

This Projects module shown in Figure 6 covers a dashboard where the system administrator and barangay official can already view the lists of barangay projects and the details, total projects per month, total number of projects per term, total budget of projects, and the percentage of project status report. Together with updating project details, archiving, searching, sorting, and filtering project records.

The projects' dashboard and project list are included in the Projects module. When the Projects menu is clicked, the system will open the connection to the database and initialize the chart and the project status. The system will also get the list of residents from the database with a limit of 5. After which, the column headers are arranged and initialized with table format.

Using computer advantages by implementing automated documents provides a higher productivity rate for municipal units in which electronic samples of legal documents and printing are way faster [23]. The document request module shown in Fig. 7 entails providing the legal document requested by either a barangay resident or non-resident done by the barangay official or system administrator. The spotlight of the system will probably ease and lessen the time processing the documents for the barangay. The system administrator and barangay officials can view all the available records and preview the legal documents in PDF format. This feature involves supplying the requisite details on the legal certificate or paper, which through the information management system, these details will be placed automatically. Additionally, only the system administrator can proceed with this functionality if new documents need to be added.

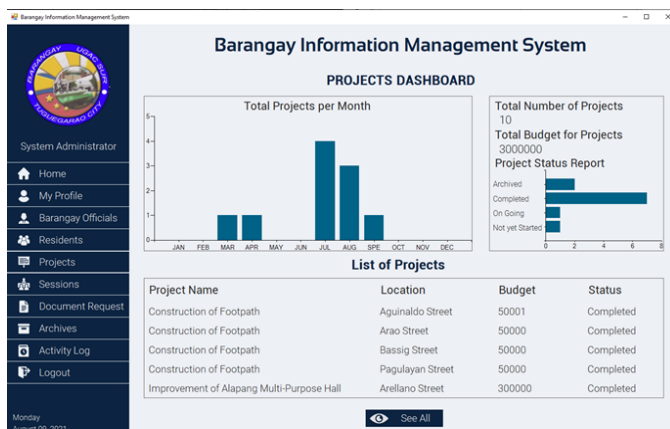


Fig. 6. Projects Dashboard of the System.

To win the increasingly competitive market, a dashboard is essential as a tool for the process of decision-making [23].

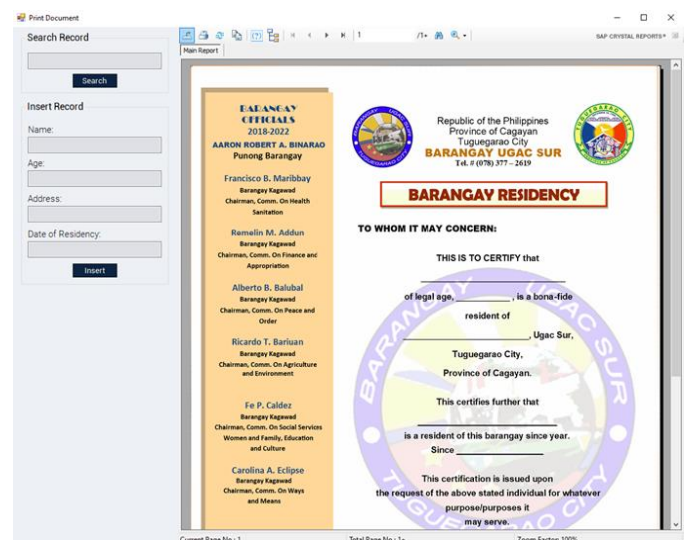


Fig. 7. Document Request Module (Print Document) of the System.

The document request module comprises varying documents and objects to be initialized. When the specific document is selected, and the details are searched or entered, the system will directly input the details into the document

itself. The system automatically inputs the document's current date through crystal reports.

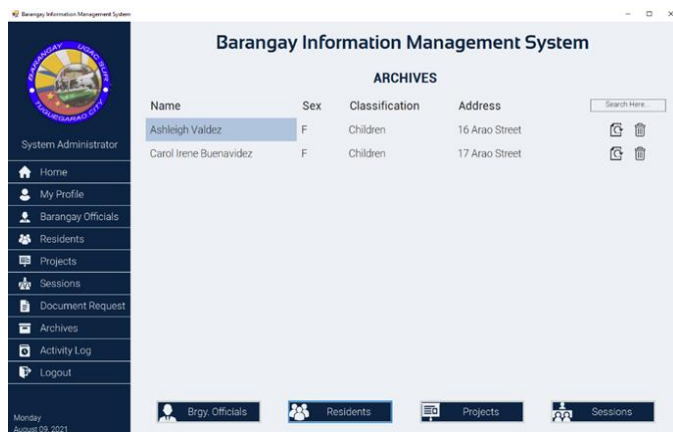


Fig. 8. Archives Module of the System.

The Archives module shown in Fig. 8 will allow the users and system admin to either restore or permanently delete the records archived in the system. It is arduous to meet society's needs through traditional archive management because it is tricky for collation, collection, and security [24]. There are subsections of this module categorized for archived barangay officials, residents, projects, and sessions.

The archived records can be accessed through the Archives module of the system. Upon clicking the Archives menu, the system will initialize all the archive records to the specific table category through a connection to the database. After that, the column headers will be filled with specific titles for the users to use the system quickly. Table formats were also allocated to tone with the color of the system.



Fig. 9. Activity Log of the System.

The part of the intrusion detection and audit processes is called the event logs used for information systems security [25]. For the activity log shown in Fig. 9, only the system administrator can view and clear the activity log in the system.

This feature of the system can record all the activities made by the users at a specific time and date.

A connection with the database must be opened when accessing the Activity Log. The system will select the table from the database named ACTLOG and will get the rows needed to be displayed. The table formats like cell styles are also observed to match the color motif of the system.

B. Evaluation Results

Table II shows that from the three groups of respondents, the overall mean for Usefulness is 4.26, and Satisfaction with the system is 4.48. These values are interpreted as "Strongly Agree." In contrast, the overall mean interpreted as "Agree" is given to the system's ease of use with a mean value of 4.19. Formulated from the general assessment results of the testers, the Barangay Information Management System received a positive appraisal.

TABLE II. SUMMARY OF RESPONSE

Respondents	Usefulness	Ease of Use	Satisfaction
Barangay Officials and IT Staff	4.5	4.49	4.38
IT Government Employees	3.78	3.75	4.38
IT Practitioners	4.5	4.32	4.67
Overall Mean	4.26	4.19	4.48

V. CONCLUSION

In this study, entitled Windows-Based Information Management System with Project Monitoring for Barangay, the researchers successfully developed the Barangay Information Management System (BIMS), which can be utilized to document transactions reliably and provide barangay services effectively through a friendly user interface. The developed system also increases the productivity rate of the barangay officials. Based on the series of evaluations and tests administered, the result shows that the developed program is usable and functional. The developed Barangay Information Management System (BIMS) also meets the requirements and necessities of the barangay officials through its flexibility and usability. The use of the Barangay Information Management System serves its purpose as a desktop application to which bonafide barangay officials can record details of the residents, projects, and sessions, and print legal documents and certificates for their respective clients. Moreover, the Barangay Information Management System will benefit the barangay, municipality, city, province, government, and even the country's national body in the future. An integrated system of each barangay will allow the officials to track the records of individuals residing in a specific barangay.

The developers recommended that future researchers and developers integrate additional policies and security measures to preserve and strengthen the security and quality of the developed system and to avoid unauthorized modifications and erroneous data. Researchers and developers may also consider a wide range of consumers and implement more barangay services into the system.

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