**WEB BASED RESIDENTIAL PROFILING**

**AND RECORD-KEEPING SYSTEM**

**FOR BARANGAY SAN RAMON**

**BAAO CAMARINES SUR**

A Capstone Project

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By

April Joyce B. Benosa

Mery Cris B. Buslon

Karl P. Cabalquinto

Neumilyn Julie D. Cortez

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**Chapter 1**

**INTRODUCTION**

This chapter consists of the introduction, project context, purpose, and description of the project, objective of the project, the significance of the project, scope, and limitations of the project, and the project dictionary that prompted the researcher to acquire a wide understanding of research.

**Project Context**

In developing countries, taking censuses is a particularly difficult task, people living in homes and group living situations will be asked questions such as how many people live or stay in each home, as well as their gender, age, and race. Their goal is to count everyone once, and only once, in the proper location. The census results of will help determine how huge amounts of money in federal funding, including grants and assistance to countries, and communities, will be spent over the next decade. It assists communities in receiving their fair share of funding for schools, hospitals, roads, and public works. The funding has an impact on many different aspects of every community, regardless of its size or location. The funds are calculated using population totals and divisions by sex, age, race, and other factors. When the census counts everyone, the community benefits the most.

The traditional approach to the population census consists in the registration of all individuals and their details using paper questionnaires during a field operation that normally lasts a few days or weeks. And according to research.net in recent decades, census taking around the world has faced major challenges, including cost pressures, concerns about intrusiveness, privacy and response burden, reduced cooperation, difficulties in accessing secure apartments and enumerating unsafe areas, more complex living arrangements, and timeliness concerns [1]

In the Philippines, a barangay is considered the smallest unit of government. Barangays are local government units that represent the government at the grassroots level. They are the pinnacle of what the government can provide and the public's first line of defense. This is referred to as an information audit by Henczel, and it focuses on the information sources, resources, display, and how information contributes to the objectives of an organization like a barangay. This study is a solution to the concerns mentioned, as well as an attempt to improve the quality of service provided by a barangay office to its International Journal of Computer Applications [2]. It is responsible for the initial operations, such as creating and implementing community-based programs, activities, policies, and other initiatives, for example as the country's population increases, so does the number of households in each barangay. As a result, an increasing number of people look to the barangay council as a unit of local government that is close to them. An increasing number of increased population means more work for barangay council members and staff. And the most common problem encountered by most barangays in is the difficulty in recording data and undependable reports of information. This is because they still practice manual use of storing and retrieving data, that’s why it’s difficult in keeping, updating, tracking and retrieving of personal information of residents in their respective barangays due to manual storing of data and when a resident requests a document or reports, barangay officials have a difficult time finding it due to manual document storage. Losing important files and documents of residents due unsecured storage and manual storing of data and the traditional paper and recording of blotter, summons and incidents which is hard to browse and update.

However technology nowadays has an impact on how people communicate, learn, and think. It benefits society and influences how people interact on a daily basis. It is a lot of hassle knowing the barangay officials have problems with collecting records of all residents. But through the help of technology and internet it can easily be accessible now a day, where many transactions are online. And to solve the problem the researcher came up with the propose system, a profiling and record keeping system that will help the barangay officials to a new way to keep track of every person living in a certain barangay without conducting traditional house-to-house censuses .

**Purpose and Description of the Project**

A web-based residential profiling and record-keeping system for barangay San Ramon Baao Camarines Sur, the purpose of this study is to facilitate the population in an area that no longer using the traditional way such as going to each house to conduct a census and to lessen the time of recording and tracing up records of every resident of the barangay, the system will facilitate barangay allowing the client barangay to keep their resident records as complete and up-to-date as possible, as well as conveniently accessible for verification, monitoring, and reference purposes, using the client Barangay's available residents' census data. This system's data, which is presented in the form of detailed reports, is extremely useful for planning, program implementation, and other related objectives. The system will gather information on all of the residents in barangay San Ramon, including profiling and collecting records of all residents in the said barangay, It is online and offline profiling for the residents to have access with or without internet connections. The online registration for the residents who have access to the internet must have verification first to know the authenticity of the residents to identify if they are real residents of the barangay San Ramon and offline registration will be available at the barangay hall for individuals who do not have access to the internet, residents can register at the barangay hall, and also the barangay health workers who are going house to house for the immunization for children can access to record all the children who have been immunized and they can also let the others residents register in the system.

The web-based system is used to secure the records of the residents that the barangay captain and his/her secretary and other officials are can access the record. Viewing and surfing the sites are the only role that the residents can do but the residents can send their inquiries or messages to the system administrator, and updates on the barangay populations are also provided via barangay demography. The study will enable the barangay to become more progressive and developed. It focuses on the design of how to file the records of all residents belonging to a specific barangay in a way that allows for simple access to necessary documents. The development of this system enables and help the barangay officials can manage the Records such as every data or profile of the residents, they can view, update, delete or edit every profile that has been registered to the system, manage and generates reports for 4ps beneficiaries, manage residents record who are vaccinated and unvaccinated against covid19, manage record for community-based immunization for children of barangay San Ramon, manage blotter records and also the barangay official can backup and recover all the data in case of data loss, to ensure that all data is protected at all times and it can also generate and print barangay reports for every street in the barangay San Ramon such as account report, residents report, blotter Report, 4ps beneficiaries report, community-based immunization for kids report.

**Objectives of the Project**

The study's main purpose is to create a Web Based Residential Profiling and Record Keeping System for Barangay San Ramon Baao Camarines Sur. It aims to develop the following objectives:

1. To identify the current problem in terms of Recording and Creating Accounts of the Residents of the said barangay
2. To develop a system that will improve the current process in terms of:
   1. Recording and Creating accounts of the residents
   2. Profiling of Residents
   3. Generating Data Analytics Reports

3. To evaluate the system based on black-box testing of this project in terms of:

* 1. Boundary value analysis;
  2. Compatibility testing;
  3. Stress Testing;
  4. Integration Testing;

**Significance of the Study**

The researcher conducted this study to provide a great and easy way to record the records of every resident. The development of Web-Based Residential Profiling and Record-Keeping System will greatly benefit the Residents of Barangay San Ramon Baao.

This study seeks to benefit the following:

**Residents**. The system will help them by offering a systematized mechanism for seeking services and sending inquiries to the administrator. It can also fasten to view the news, meetings, and events in the barangay, as well as updates their present status.

**Barangay San Ramon**. The Barangay San Ramon as the primary beneficiary of the system. It would be efficient and fast delivery of service.

**Barangay Captain.** Head of the barangay. It will be less difficult for him or her to check and process their residents' records.

**Barangay Personnel.** The one who manages the files and information of the barangay for it will have simple access to the data they require. It will also reduce the amount of paper they save and allow the system to store it in a way that is easily accessible.

**Future researchers.** This would serve as a reference and guide for their study.

**Scope and Limitations of the Study**

This study aims to gather information on all of the residents in Barangay San Ramon, including profiling, collecting records and creating of accounts of all residents in the said barangay. The system facilitates the barangay by allowing the barangay officials or secretary to keep their residents' records as complete and up to date as possible and easily accessible for verification, monitoring, and reference purposes. The system also provides post news, events, programs, and meetings for the residents and they can send their inquiries or messages to the system administrator. Updates on the barangay populations are also provided via barangay demography. It also manage residents records who are vaccinated and unvaccinated against Covid19, 4P’s beneficiaries, and also the record of community-based immunization for children of barangay San Ramon. The system development will include test performance of the system using black-box techniques such as Boundary value analysis, Compatibility testing, Stress Testing and Integration Testing.

The following are not included by the system is barangay documents, certificates and clearance for business purpose and other transactions outside the barangay, the system will be limited to the Residents of Barangay San Ramon Baao, Camarines Sur only.

**Project Dictionary**

This part of the study defines the technical terms and terms used in the study. For better understanding, conceptual and operational definitions are provided:

**Web-based.** An external application that is accessed via a web browser over the Internet. A Web-based application refers to any program that is accessed over a network connection using HTTP, rather than existing within a device's memory. Web-based applications often run inside a Web browser [3]. In this study it refers on system that provides access to the barangay profiling and record keeping system using a computer and internet connection.

**Profiling.** The practice of categorizing people and predicting their behavior according to particular characteristics such as race or age[4]. In this study it refers to categorize records of the residents and provides information of each resident of the barangay san ramon.

and statistics according to gender and age bracket

**Database.**  A large amount of information stored in a computer system in such a way that it can be easily looked at or changed [5]. In the study it refers to storing of data of residents information, user, personnel, events, streets, and barangay officials.

**System.** Is a way of working, organizing, or doing something which follows a fixed plan or set of rules [6]. In the study it refers to computer technology that can easily manage the barangay resident profile and record instead of manual paper based. **Administrator.** A person whose job involves helping to organize and supervise the way that an organization or institution functions [7]. In the study it refers to the barangay officials who can only use and manage the system.

**Boundary value analysis.** Is based on testing the boundary values of valid and invalid partitions. The behavior at the edge of the equivalence partition is more likely to be incorrect than the behavior within the partition, so boundaries are an area where testing is likely to yield defects [8]. In the study in developing the system it will find the errors at boundaries of input domain in rather than finding those errors in the center of input.

**Compatibility testing.** Is an assessment used to ensure a software application is properly working across different browsers, databases, operating systems (OS), mobile devices, networks and hardware. Compatibility testing is a form of non-functional software testing meaning it tests aspects such as usability, reliability and performance that is used to ensure trustworthy applications and customer satisfaction [9]. In the study it is used to see if the program can run on a variety of hardware, operating systems, applications, network environments, and mobile devices

**Record Keeping.** The maintenance of a history of one's activities, as financial dealings, by entering data in ledgers or journals, putting documents in files, etc [10]. In the study it is used to organize the record of the residents.

**Integration Testing.** Integration testing involves bringing together two components of the system and checking that there are no "disagreements" between them. The idea of risk (the risk of incompatibility between systems) is more the focus of integration testing than tester expertise [11]. In this study, the purpose of integration testing is to examine the interfaces between the modules and identify any flaws that could occur when these components are combined and required to communicate with one another.

**Stress Testing.** Stress Testing is a method of software testing that examines the software's robustness by testing it beyond the parameters of its typical use. It is a kind of software testing used to confirm the dependability & stability of software applications. The purpose of stress testing is to evaluate a piece of software's robustness and error-handling abilities under conditions of extremely high load and to make sure that it won't crash under pressure. It even conducts testing that goes beyond typical operational conditions to assess how software performs in harsh environments [12]. In this study it will be used to ensure and determine that the capacity of the system will continue to function effectively and won't crash under any kind of environment.

**Notes**

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**Chapter 2**

**REVIEW OF RELATED LITERATURE AND SYSTEMS**

This chapter contains all relevant literature from various sources, such as completed articles, journals, dissertations, research, and others. This concept from several sources will present readers and future researchers with an idea. This literature will also assist the researchers in gaining further knowledge and ideas for their study.

**Related Literature and Systems**

This chapter includes literature by both foreign and local authors. This is also a way to learn more about the current study's experience. This literature will assist researcher in gaining additional knowledge and ideas for their study.

**Record Management System**

The study of **Kofi Adom-Nyankey et. al 2021** describes that the Effectiveness of Human Resource Records Management Strategies in Ghana are important to the effective management of enterprises, according to the author. Despite their importance, records management studies neglect them. By investigating the efficiency of human records management practices in Ghana, the study attempts to bring to light human resources records management concerns that have been disregarded despite previous studies on records management [1].

Also, **Chigariro, Dickson 2018**, stated that electronic records management has become a game changer in the records and archives management field. Traditional records and archives management work procedures, work methods, theories and principles have been questioned and new schools of thought, paradigms and philosophies birthed. Researchers and scholars in the records and archives management field have also pursued research on e-records management and such research has been varied and been different [2].

In addition according to **Nestor et. al 2018**, Barangays are local government units that represent the government at the grassroots level. They are the pinnacle of what the government can provide and the public's first line of defense. This is referred to as an information audit by Henczel (n.d.), and it focuses on the information sources, resources, display, and how information contributes to the objectives of an organization like a barangay. This study is a solution to the concerns mentioned, as well as an attempt to improve the quality of service provided by a barangay office to its International Journal of Computer Applications [3].

Furthermore **Claire Ong Carpio 2020**,stated that the Barangay Management System or e - barangay is a web - based management system which shall reinvent barangay management from a traditional and centrally dependent unit towards a more inclusive and citizens-oriented scheme. It essentially aims to streamline existing administrative processes in terms of requesting documents, filing complaints and generating apt and accurate local statistics [4].

**Record Keeping System**

In a rural environment in Southwest Nigeria, the study of **V. Oladoyin 2017** was done to evaluate various methods of collecting childhood immunization records based on community ideas. Participants in the focus group agreed that using the immunization card as a method of storing immunization records was not a problem and that there were no better options. However, there were also recommendations for better ways to retain the cards, such as keeping them in the bank or having a copy in the health facility [5].

According to **Manitoba 2020**, a recordkeeping system is a shared filing system that records, organizes, accesses, protects, retains, and destroys data in line with agreed record retention and destruction schedules. More than technology is involved in a recordkeeping system. It must also be used in conjunction with rules and processes, clearly defined roles and duties, and regular training in order to be an effective system for managing paper or digital records [6].

Moreover, **Ricky Gervais 2011**, said that the goal of the record keeping system is to create a web-based system that can manage residents/clients on a server that can be accessed via a web browser, as well as to secure the records of the residents so that only the Barangay Captain and his/her secretary have access to them[7].

The approach described in the study of **Sodring T, Reinholdtsen P, Massey D 2020** demonstrates how record-keeping principles could be used to help government organizations manage IoT data. Design/methodology/approach: The general record-keeping concepts are used as a foundation for a high-level discussion on how IoT data can be managed in this study [8].

**Profiling System**

Early court cases established that it was inappropriate to assess the degree of racial profiling by simply comparing the racial composition of stopped individuals to the racial composition of the local residential population, according to Neighborhood Residence and Assessments of Racial Profiling Using Census Data according to **Lance Hannon 2019** [9].

As well as, **Md Shamsur Rahim 2021**, the developed advanced user profiling technique was shown to be beneficial because it identified previously unseen residential customer behavior. This study used advanced customer profiling techniques adapted from the machine learning research domain to analyze high-resolution data collected from residential digital water meters. Furthermore, the technique can detect and respond to novel changes in behavior, which is a crucial aspect for promoting and maintaining long-term water saving practices [10].

In this study of **Angelique et. al 2020**, E-government, as its core, might achieve good governance by profiling each family in the community utilizing information and communication technologies. Essential information such as labor and job statistics, family income and expenditures, demographics by (population) and (age), water and sanitation, housing type, and education could be provided once profile data has been aggregated [11].

**Monitoring System**

According to **Uta Wehn et. al 2019**, Citizens are involved in new responsibilities such as data collecting for environmental monitoring, data and knowledge exchange for collective decision, and cooperative planning through community-based monitoring and information systems, often known as "citizen observatories."[12].

Moreover, **Antonio L 2020** This research focused on the design of a Web-based Crime Monitoring Module that improves the barangay justice system by keeping track of and managing communal infractions. The technology allows for a more effective monitoring of infractions and blotter cases in chosen barangays, resulting in better peace-and-order management [13].

In addition, **Charlotte et. al 2020**, The Community Based Monitoring System (CBMS) aims to fill data gaps in diagnosing the extent of poverty at the local level, assisting in the determination of the causes of poverty, the formulation of appropriate policies and programs, the identification of eligible beneficiaries, and the evaluation of policy and program impact. It also aids decentralization by training LGUs in data collection, analysis, and application in local planning and program execution [14].

Furthermore, **Bergado T 2020,** the purpose of the study was to establish the benefits that the system provides to the school clinic and how easy it is to manage the medical records and staff of Saint Michael College of Caraga students (SMCC). According to the research, the system is both necessary for handling medical records and advantageous to the institution. Furthermore, this system secures files and adds information to both students and workers; additionally, the system updates information if a patient's status changes - fast-tracking data that is useful to the clinic attendant. The system also generates three types of reports that are simple to work with. [15].

**The Use of Black Box Testing**

According to **Gilang Ryan Fernandes & Ika Mei Lina 2021** that application testing is required before implementation to avoid bugs or errors. Consider the application testing phase importance, testing with the black box method was carried out on library applications using the Boundary Value Analysis (BVA) technique in their study. When the application is implemented, there will be no more errors caused by differences in the value data during the input process with the stored value data, after testing using the black box method with the BVA technique and documentation of each test[16].

Also**, S Sutiah and S Supriyono 2021,** stated that of uses the Blackbox Testing approach to e-learning Madrasah software testing. The testing scenario includes several scenarios, including login form testing, class setting testing, computer-based test testing, student learning evaluation testing. The scenario can be used to test functionality so that the recommendation results can be used to develop e-learning madrasah in the future[17].

According to **Muhammad Sholeh et al 2021,** Black Box Testing is done by testing the application without seeing / knowing the internal structure of the code or program. The research was carried out using boundary value analysis and equivalence partitioning methods. The results show that the development of ukmbantul.com has considered the limitations in data entry. The form used for the data entry process has been validated in accordance with the applicable limitations [18].

Futhermore, **Kartiko, C. 2020,**  The process of using a submission system on a website requires many menus and features that must be available. However, in making a website there are often errors in the interface, submission system, task orientation, submit login, submit sign-up, writing, content quality, page layout, visual design, help and error tolerance. Using black-box testing boundary value analysis techniques.. The test results show that there are still many shortcomings when validating data that will be input so that it can cause data stored in the database does not match the expected data. Test results can be used as input to improve the system.[19].

Lastly, **Munthe, I. R. et al 202.** The black box evaluation method serves as a software assessment. The system must meet its specifications and be capable of converting data into usable and efficient users. E payment information system enables the entry of cash transaction data to SMA Teluk Panji through administrative staff (TU). When the system testers test this system as designed and focused on the school payment information system, the information system software is appropriately controlled by the external control mechanism.[20].

**Synthesis of the State-of-the-Art**

The previously stated studies whether in terms of literature or system, bear some parallels and differences about recent developments of information technology that have resulted a faster, accurate and efficient transaction ways of storing, recording and monitoring data support by the proposed study Web based Residential Profiling and Record-keeping System for Barangay San Ramon Baao, Camarines Sur.

According to the studies of Uta Wehn et al and Antonio L, community-based monitoring and information systems, also referred to as "citizen observatories", are used by citizens to carry out new duties such as data collection for environmental monitoring, knowledge sharing for group decisions, and cooperative planning. This research concentrated on the development of a web-based crime monitoring module that enhances the barangay justice system by monitoring and controlling public offenses. The technology enables a better administration of peace and order by enabling a more effective monitoring of infractions and blotter cases in selected barangay. Their system is similar to our proposed study in terms of monitoring system.

In the studies of Ricky Gervais, Manitoba et al and Sodring T et al, In order for a system to effectively manage paper or digital records, it must also be utilized in combination with guidelines and procedures, roles that are specified and regularly updated training programs. Data management for government organizations could be aided by record-keeping rules. Creating a web-based system that can manage residents on a server that can be accessible via a web browser is the aim of the record-keeping system, along with the goal of protecting the residents' records. Their system is similar to our proposed study in terms of Record keeping system.

The Residential Profiling and Record-keeping System for Barangay San Ramon Baao will be a great help for both barangay personnel and residents of the barangay wherein they have an assurance that their personal information are kept in a safe place and can save time and efforts in terms of handling and updating the profile. Indeed, it will help the barangay to manage their own residents information. Also, the study will be evaluated using black box testing.

**Gap Bridged by the Study**

The researchers established the current study after reviewing related literature and studies. It is important to note that there were similarities in some studies but they were distinct from the present study.

On the above mentioned RRL the researchers came up with a research plan to design and propose a system entitled: "Web-based Residential Profiling and Record-keeping System for Barangay San Ramon Baao Camarines Sur" to help the user in managing their personal information. The goal of the study is to improve the user's information technology skills through the use of computers. Also, it has some features that the past studies don’t have, it includes the combination of profiling and creating accounts. The residents can send their inquiries or messages to the system administrator. Generate data analytics reports and updates on the barangay populations are also provided via barangay demography. Manage residents' records who are vaccinated and unvaccinated against Covid19, 4P’s beneficiaries, and also the record of community-based immunization for children, pregnant woman, Malnourish children and Senior Citizens of Barangay San Ramon Baao Camarines Sur. The system also provides post news, events, programs, and meetings.

**Notes**

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**Chapter 3**

**TECHNICAL BACKGROUND**

This chapter states the presentation of the methods, procedures, and instruments used in conducting the present study, which provides the basis for the Residential Profiling and Record-keeping System for Barangay San Ramon Baao Camarines Sur.

**Software Development Methodology**

In the development of Residential Profiling and Record-keeping System for Barangay San Ramon Baao Camarines Sur the researcher will use the Agile model particularly Extreme programming as the guide to ensure the success of the project. Extreme Programming is a method of software development where the model will be designed.

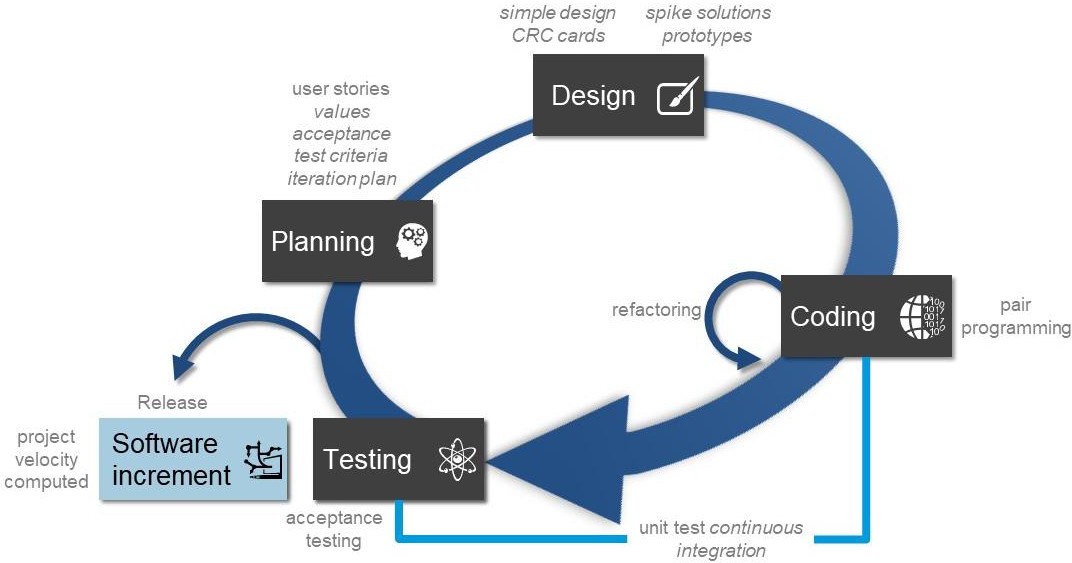
Figure 1 shows the Extreme Programming model, followed by a discussion of the tasks to be completed throughout each step.

Figure 1: **Extreme Programming**

*Planning.* The first stage of the Extreme Programming life cycle is planning, in which customers or users collaborate with the development team to establish 'user stories' or requirements. The development team turns user stories into iterations that cover only a portion of the desired functionality or capabilities. A series of iterations results in a fully functional product for the consumer [2]. The system begins with the requirement analysis wherein the researcher determined and analyze the problems encountered by the current system by obtaining information about the client. The researcher conducted interviews to know the current system used for recording their personal information in the barangay.

*Designing.* Using Software Class Responsibilities and Collaboration (CRC) Cards that allow for a departure from the traditional procedural mindset and make possible object oriented technology. Such cards allow all members of the project team to contribute ideas, and collate the best ideas into the design [3]. In this stage, the researchers planned a possible solution to the problem specified in the preceding stage. They gathered information and documents to be used in designing the system. As the problem was defined, the researchers came up with the design in Residential Profiling and Record-keeping System for Barangay San Ramon Baao Camarines Sur as a solution to be stated to the problem.

*Coding.* Developing the code based on the agreed metaphors and standards, and adopting a policy of collective code ownership [4]. This stage was a program implementation and how it was constructed. In this part, the researchers translated the program design into computer code, a format, a pattern and a set of instruction readable by a computer.

*Testing.* Extreme program integrates testing with the development phase rather than at the end of the development phase. All codes have unit tests to eliminate bugs, and the code passes all such unit tests before release [5]. The researcher will use black-box testing, to test the system against external factors responsible for software failures and also to address the problem, and modules were made to see if the program is working and present the expected output.

*Listening.* The basis of extreme programming is a continuous mechanism of customer involvement through feedback during the development phase. Apart from the customer, the developer also receives feedback from the project manager [6]. This phase the researcher will receive feedback from the client. Each feedback of the client that specifies revised requirement becomes the basis of a new design of the system, and the process of design-coding-tests-listening repeats itself.

**Material and Statistical Tools**

This section enumerates and examines the research methods and statistical tools containing specific information on the data's source, sampling techniques, statistical techniques, and data-gathering instruments about the objectives of the proposed project

**Research Design**

The research design will use in this study is mixed method qualitative and quantitative research approach based on the study's general and specific objectives. According to Kolner Z Soz Sozpsychol [2017] Mixed methods use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques for the broad purposes of breadth and depth of understanding and corroboration. This research design is relevant to this study since its unique objectives require quantifying data such as the profiling, monitoring and record keeping in the barangay.

To implement the qualitative approach, the researcher will conduct an interview in the barangay officials to learn about the problems they've had with collecting and storing data and profiling of the residents in their barangay. And for quantitative approach the researcher will use Blackbox texting to evaluate the level of performance of the newly established system, and also the IT experts for checking the functionality of the proposed system.

**Research Method**

In this study the research method used by the proponents in proposing the Web Based Residential Profiling and Record Keeping System for Barangay San Ramon Baao Camarines Sur is through interview for gathering the data. This research will be used to collect and monitor all the residents of Barangay San Ramon to develop the proposed project. This section will include the instruments to be used and the respondents.

**Hardware and Software Tools**

The system development part of this study will be utilizing the following hardware tools to fully accomplish the functional requirements of the document repository system. Table 1 and 2 presents these tools and specifications.

Table 1

**HARDWARE TOOLS**

|  |  |
| --- | --- |
| **Hardware Tools** | **Specifications** |
| Monitor | Any Brand of LED Monitors Intel Pentium G620 |
| CPU | Intel Core or Xeon 3GHz (or Dual Core 2GHz) or equal AMD CPU |
| Mouse | USB Mouse |
| Memory | 256 GB HDD |
| Ram | 4GB |
| Modem/Router | Frequency 2.4GHz or 5GHz, 300 to 600 mbps |

Table 2

**HARDWARE TOOLS**

|  |  |
| --- | --- |
| **Server (Personal Computer or Laptop)** | |
| CPU | Intel Core or Xeon 3GHz (or Dual Core 2GHz) or equal AMD CPU |
| Memory | 256 GB HDD |
| Ram | 4GB or above |
| Monitor | Any Brand of LED Monitors Intel Pentium G620 |
| Mouse | USB Mouse |
| Keyboard | Built in/USB type |
| Modem/Router | Frequency 2.4GHz or 5GHz, 300 to 600 mbps |

In the hardware tool the monitor it used displays the video and graphics information generated by a connected computer through the computer's video card, and the CPU calculates and interprets instructions while surfing the web application, and the mouse is handheld hardware input device that controls a cursor in a GUI for pointing, moving and selecting text, icons, files, and folders on the computer. And as for the memory device that is used to store data or programs and the Ram handle all active tasks and apps.

Further, Table 3 presents the software tools and its specifications that will play a vital role during the system development.

Table 3

**SOFTWARE TOOLS**

|  |  |
| --- | --- |
| **Software Tools** | **Specification** |
| Operating System | Windows 7 or Latest |
| Browser | Firefox, Google Chrome, Opera |
| XAMPP | 3.5 version (Apache, MySQL) |
| Scripting Language | PHP, JavaScript |
| Programming Language | HTML, CSS |
| Integrated Development Environment (IDE) | Visual Studio Code |
| Framework | Laravel |

In the Software tools the Operating System used to handles the memory and operations of the computer, as well as all of its software and hardware. A browser it is a software that allows to find and view websites on the Internet and XAMPP is a local host or server used to test clients or websites before they are published to a distant web server. On a local computer, the XAMPP server software provides an adequate environment for testing MYSQL, PHP, Apache, and Perl projects. The programming language such as HTML and CSS are for the front end to be used from making layout, structure and to style a website, and for the back end the PHP and Java script to make dynamic web pages and the sublime text are for the code editor for making the project.

**Instrument**

The researcher made use of the interview as the main data gathering instruments to complete the process of data gathering.

***Interview.*** The researchers will conduct a short interview with barangay authorities to learn about the profiling and record-keeping method and to determine the problem encountered by the barangay in term of updating, monitoring and generating reports. Consistent and precise information facts and data where taken for the completion of the study. Evaluation will be done through system testing.

***Interview Guide.*** The researcher will create a reference document in preparation that can either memorize or refer to while the interview is taking place. An interview guide is a list of subjects or inquiries the interviewer intends to bring up during the interview. It designed to gather information from the clients specifically the residents and barangay officials. Before the program is developed, an interview will be held to determine the client's preferences. It will be beneficial for the researchers to speak openly with the client and choose the best way for the project's advancement. It outlines how to ask questions in an interview progressively and when to ask follow-up queries. The researchers will be able to determine the profiling and record-keeping procedure with the aid of this. Answers to particular objectives will be gathered using the interview guide.

**Data Gathering Procedure**

In this section, the researcher will use different kinds of method to collect the necessary data for the research. Using one on one interview and black box testing to get an accurate data.

***One on one interview*.** An interview is accurately defined as a formal meeting between two individuals in which the interviewer asks the interviewee questions in order to gather information. Using this method not only collects personal information from the interviewees, but it is also a way to acquire insights into people’s other skills. Interviewing people can help the researcher learn more about the respondents. The researcher will conduct an interview in the barangay officials in order to interview the target respondents about the research. We'll be using interview guide questions to use and guide the researcher though out the interview.

***Black box testing.*** This testing strategy will focus on the input that the program receives and the output that is generated. The testing team leaves out technical information like code, server logic. And development methodology. Black box testing compares the system’s functionality to predetermined requirements and is based on the specification based on our study. To evaluate the system based on black-box testing of this project in terms of:

a.) Boundary value analysis

-The primary objective of a software tester doing a boundary value analysis test is to determine whether the application is providing the right input or not when entering the boundary values.

Table 4

**Boundary value analysis**

|  |  |
| --- | --- |
| **Possible Results** | |
| Invalid (0) | Valid(1) |
| Not reach the expected inputs but still no error message and accepted by the system / It reach the expected inputs but it’s still not accepted by the system | Not reach the expected inputs and it has an error message and not accepted by the system / It reach the expected inputs and accepted by the system |

|  |  |  |
| --- | --- | --- |
| Test Cases | Expected Inputs | Result |
| Number of characters to input in password Field | 6 to 30 characters |  |
| The age of the user are required to input in age field | 15 to  100 years old |  |
| Phone number must be entered in the phone number field. | 11 numbers only |  |

b.) Compatibility testing

-Compatibility testing is a type of non-functional software testing, which means it evaluates aspects like usability, dependability, and performance to guarantee reliable applications and customer satisfaction and to determine whether the software can function properly on the following;

* Hardware
* Operating Systems
* Network settings
* Mobile devices.
* Browser

c.) Stress Testing;

-In order to ensure that the system won't crash under pressure, stress testing will be used to assess its robustness and error-handling capabilities under conditions of extremely high load. In order to evaluate how software functions in challenging circumstances, it even undertakes testing that goes beyond standard operational conditions.

Table 5

**Stress Testing**

|  |  |
| --- | --- |
| **Possible Results** | |
| No Errors Found (0) | It Have An Errors (1) |

|  |  |  |
| --- | --- | --- |
| Test Cases | Description | Result |
| Residents registration | Even if there are too many residents to register, the system works properly and can still operate. |  |
| Residents Login | A very large number of people attempt to log into the system at once. |  |
| Storing data to the database | The database is constantly adding enormous amounts of data. |  |
| Showing data to the page from the database | When the website tries to access a linked database from the front end, the database automatically disconnects. |  |

d.) Integration Testing

-A type of testing in which software modules are conceptually integrated and tested as a group. Multiple software modules created by various programmers make up a typical software project. This level of testing's objective is to find issues with how various software modules interact when they are combined.

Table 6

**Integration Testing**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test Case Objective | Test Case Description | Valid Result (1) | Invalid Result(0) | Result |
| Check the interface link between the Register, Login and Homepage Module | Register then enter login credentials and click the Login button | To be directed to the Home Page | Not directing to the homepage |  |
| Check if the database's data is making it into the documents. | Specific information of the residents are getting called in the documents | Information of the residents are being viewed by the user in the documents | The information cannot be viewed by the user in the documents |  |
| Check the accounts and profiles of every residents who registered | The profiles of every residents can edit and delete by the user | Successfully updated and also it can be deleted | It cannot update or delete |  |

**Sampling Technique**

The respondents of this study is the barangay officials from Barangay San Ramon Baao Camarines Sur. The researcher will use purposive sampling particularly total enumeration to collects data where all members of the whole barangay officials are measured.

The researcher may also include the residents in the said barangay and the researcher will use. The convenient sampling will collect data from people who are readily available to participate in the study.

**Statistical Test**

The researcher will utilize the following statistical measures to analyze the gathered data for black box.

Table 7

**Level of functionality using Black Box.**

|  |  |  |
| --- | --- | --- |
| **Value** | **Level of Functionality** | **Representation of Value** |
| 0.00 -0.33 | Least Functional | Not ready for deployment; numerous bugs and problems have been found; more testing is necessary. Although the system is functional, its capabilities are constrained. |
| 0.34 – 0.66 | Moderately Functional | Although the system is functional, there are a few flaws and issues that need to be tested more thoroughly can be applied according to the user's preferences. |
| 0.67 – 1.00 | Fully Functional | No errors found, the system is ready for deployment. Incorrect and correct inputs are noted in every module, which is operational. The test scenarios deliver what is expected. |

**Weighted Mean.**This will be used as the following statistical treatment of data techniques will use for the processing of data. The researcher will utilize Frequency and Percentage Distribution and Ranking to determine the problems encountered in current, future data utilization and system operation.

Below is the formula used for calculation:

**W M = F W**

**N**

Where:

WM = Weighted Mean

F = Frequency of number of responses

W = Weighted category of responses

N = Number of responses

**Notes**

[1-5] Understanding the Extreme Programming Life Cycle Phases, https://www.brighthubpm.com/methods-strategies/88996-the-extreme-programming-life-cycle/?fbclid=IwAR2xkJsGO4J7SvCwV31gTUjABJwn8ZnVlihBZ\_g9R7r5MxWFVmfWNXpNFlk

[6] Kolner Z Soz Sozpsychol 2017, How to Construct a Mixed Methods Research Designhttps://www.ncbi.nlm.nih.gov/pmc/articles/PMC5602001/