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Chapter 1 – PROJECT OVERVIEW

Project Background

Barangay 752, is an administrative unit in Santa Ana, Manila. The barangay addresses the needs of its residents through programs and their services. They are responsible for maintaining public order in their occupied area, to keep implementing local government policies. The current positioned chairman is Hon. Antonio T. Quirante and council, who handles various administrative tasks and community-related functions. Furthermore, the barangay facilitates services such as issuing certificates and managing community records that are manually done. The primary landmarks of the barangay are near MJM Sari Sari Store, Marian Townhomes, Manila Day Care Center, F. Flores st., Barangay 752 Zone 81 Hall situated in Santa Ana district 5 of Manila, Philippines.

Carpio and Basilan State College (2020) reported that although some barangays have already made use of computers and electronic devices to carry out official transactions, conversely, most are still caged with the manual-based operations. Many barangays in the Philippines still rely on manual documentation processes that hinder the development and services of the barangay. Barangay 752, is one of the fitting examples that still faces issues. The barangay faces numerous problems that hinder efficient service delivery and correct documentation. First, it is challenging to get a precise population estimate while counting residents by hand because this method frequently results in errors and inaccuracies. The lack of trustworthy data affects the process of filing important

documents like certifications and permits. As a result, when citizens request these records, the barangay frequently encounters slow recordkeeping and delays due to the manual processes required. Furthermore, communication with locals about their problems is confined to phone texts, calls, social media apps such as Messenger and Facebook, emails, and direct visits to the barangay office. This form of communication technique causes delays in addressing residents' complaints and further complicates the overall management of barangay services; hence, they must monitor it every day.

In consideration of the foregoing challenges of the barangay, the researchers regarded that the barangay will effectively benefit from implementing a system for the transition to automate and streamline governance processes.

As per Bringula et al. (2021), the development of an efficient and highly capable barangay system involves a series of key features and services that were discussed in their framework of an E-barangay. It focuses on the critical importance of employing a centralized database structure and administration, which is a key element in the establishment of an E-barangay system. By transitioning it to switch from manual to online record keeping seamless, it makes a positive impact on the availability of their processes as well as their administrative effectiveness compared to other more traditional ways of approach. The barangay can keep all resident data within one single database framework. This reduces the likelihood of human error in their processes and facilitates updating and retrieval of the information they store. They stated that their framework suggests that the systems to be developed at the barangay level have

the capabilities of processing complaints, receiving requests for documents, sending suggestions, and disseminating notifications or announcements. Additionally, they have mentioned that the system they developed had received positive ratings from the residential habitants of the barangay on their subjective metrics. Furthermore, their objective standards and metrics reveal that all activities are able to be completed with great convenience and finesse. This potentially suggests that Barangay 752's manual record-keeping has also great potential to be converted into digital data and can be kept within a centralized database, rendering forward-seeking solutions in the aid of managing the barangay's residents' information with precision and efficiency, reducing the setbacks in the processing of their barangay's documents.

To conclude this, it is a case study holding great relevance in terms of tackling the bigger issues encountered in the numerous barangays in the Philippines that still largely depend on the static manual processes that have existed for a prolonged period. In striving for an improvement on the measure of better governance in these barangays and ensuring that these barangays are able to serve their people exceptionally well, these issues should be crucially addressed through the initiative of modernizing their processes.

Objectives of the Project

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The objective of this project is to provide a management platform that modernizes and streamlines the services that the Barangay 752 offered, to provide accessible, efficient and convenience for the residents of the barangay. With a web-based platform, residents can access essential services online, to help residents reduce their person visit and make it more convenient to them potentially for residents within or outside the barangay. In the implementation of a web platform in the barangay, the residents are able to access the services that are significant in the barangay, requirements that they need as soon as possible, creating a decrease in the need for face-to-face visits in the barangay. Locals about their problems are confined to phone texts, calls, social media apps such as Messenger and Facebook, emails, and direct visits to the barangay office. This form of communication technique causes delays in addressing residents' complaints and further complicates the overall management of barangay services; hence, they must monitor it every day.

In consideration of the foregoing challenges of the barangay, the researchers regarded that the barangay will effectively benefit from implementing a system for the transition to automate and streamline governance processes. This approach also helps ease congestion at the barangay office and In addition to improving service delivery, this approach will help the community and the barangay communicate more effectively. Outlining the project's scope, the following goals center on creating safe, intuitive technologies that facilitate administrative supervision, community involvement, and effective service processing.

General Objective

The general objective of the study is to develop an E-barangay management platform that facilitates various barangay services online, where residents can request services, access announcements, and receive updates directly through the platform, thereby saving time and improving the flow of visitors at the barangay office, making services more accessible and efficient for residents.

Specific Objectives

- To develop an E-barangay management system that is able to store and update resident information securely, streamlining profiling and keeping track of the population size of the barangay.

- To develop a user-friendly resident portal that enables residents of Barangay 752 to manage their profiles, access their resident records, certificates and permits, their complaint records and to the barangay's demographic information.

- To incorporate the SMS notification system that sends important announcements and updates directly to residents' mobile phones, ensuring timely and efficient communication with the community.

- To develop an online certificate issuance system that allows residents to request certificates, make payments directly at the barangay hall, and receive SMS notifications for follow-up feedback, thereby streamlining

the certificate application process and reducing the need for multiple visits to the barangay office.

- To create an online blotter filing system that enables residents to file blotter reports online, including data such as the date and time of the incident, location, details of the incident, proof of evidence, parties involved, and the nature of the incident.

- To create an online incident reporting module that allows residents to file incident reports online. This module will capture essential data, including the date and time of the incident, location, detailed description of the incident, supporting evidence, individuals involved, and the nature of the incident.

- To develop a barangay report module where residents can submit complaints, and grievances, enabling barangay officials to take these complaints in consideration for the improvement of the barangay and address issues efficiently and maintain transparent records of all cases.

- To develop a family module that enables the barangay to list down all the families and the associated blood family members of each recorded family. Families will be recorded and assigned in the family module and can be monitored and managed by the barangay, including changes in status of each family in the barangay as well as the heads of each family.

- To test and evaluate following the metrics to be used on the system which includes: functionality, usability, reliability, maintainability, and security, taking into consideration that it must meet the mentioned

requirements and should provide a satisfactory experience for both the barangay and its residents.

Statement of Work

Outlining how modern barangays now require a need for more efficiency for local governance, it has become very evident that there is a need to shift from manual to digital, from a manual system into an automated barangay management system. In order to eliminate this demand, the project will implement a web-based information management system in Barangay 752, Singalong, Malate, Manila. The proposed system acts as a means to be able to improve upon the barangay's administrative efficiency and to make communication between the barangay officials and residents more linear. With the automation of generating permits and certificates in the barangay, the issuance of these documents, reporting to the barangay regarding their relevant matters and family registration, the system seeks to reduce delays and improve service delivery. Inclined to this project, technological improvements in such areas are essential to the boosting of transparency and accountability within the barangay administration. As the primary units of governance in the Philippines, barangays must adopt such systems to effectively manage resources and respond to residents' needs.

Scope of the Project

The project is aimed at developing a web-based management system for the use of both the residents and the barangay office. Through this platform, the project seeks to improve the swiftness and access to the services of the barangay by creating the platform itself, where services will be done online mostly as well as the management of the barangay. Ultimately, the purpose of establishing an online system is to create and develop the engagement and the responsiveness of the community in Barangay 752.

The system would include an SMS notification module or feature, reaching the residents directly through their phones to receive the announcements posted by the barangay in real time. Besides announcements, residents will be able to be informed through the sms feature of the barangay of whatever service in the barangay they have availed, and they will be notified when they are scheduled to come in the barangay, updates regarding their activities in the barangay.

Additionally, an Account Management Module establishes different authorization levels: the barangay chairman serves as the administrator with full access, the secretary has adjustable access such as having full access or having a certain access limitation. They will have access to their information and services. Together, these modules create an integrated platform that enhances service delivery, transparency, and community engagement in barangay governance.

Additionally, the system will facilitate account management through the account management module that it will feature, leaving constraints in terms of access level with these particular roles in the system: the chairman will have the highest role in the barangay along with the secretary. These two positions or roles will contain most privileges in the barangay. The next will be officials which can be granted access to other modules besides the residents' modules, officials in certain situations will be given privileges depending on the situation and volition of the chairman. The lowest will be the resident users who are restricted to access admin side modules and only given access to their own modules.

Resident profiling in the system will be facilitated by gaining access to the resident's barangay information and the system's information by means of both the resident list module and the resident account management module. Residents will be asked to provide certain information upon registration in the system and will be either approved or disapproved by the barangay depending on the situation.

The Family Module is designed to organize residents' information at the family or household level. Each family assignment links family members related by blood, allowing for efficient grouping and easier access to family data. The barangay may view each family's information in a centralized account, making it convenient to track details like family member names, addresses, birthdates, and contact numbers.

Complaints and grievances will be transmitted to the system with the development of the Report module of the system, where residents are free to put in complaints and suggestions for the barangay if there are noticeable issues that can aid the barangay in its improvement. The module is divided into two separate ends—the resident side and the official side. The resident side of the module is free to send complaints that they've noticed by filling out the digital form that the system will be providing to the resident; on the other hand, the official side of the system will be on the receiving end of the module, where the officials will be able to receive the forms and provide SMS feedback to the resident who filed the complaint.

The E-blotter filing module will only be operated by the barangay management, not allowing any other users to access this module except for the barangay office itself only due to legal constraints. The E-blotter filing module will be filed only at the barangay office itself for purposes such as recording vital records of blotters and for more efficient data retrieval when trying to find blotters. Residents may provide the details of the blotter but only the barangay must be the one to encode it on the system, depending on the user access privileges given by the chairman or whoever is authorized to encode.

The system also has a Population Report Module that facilitates the analysis and management of demographic data, enabling barangay officials to monitor population trends and make informed decisions. The system will also have a document issuance module where each citizen may be notified through sms the

notification that their documents have already been scheduled for release or already good for release for their actual claiming. Residents will be asked to claim their documents in the barangay.

In developing the system, the proponents will be using an MVC approach towards their backend structure, utilizing PHP and MySQL for the backend. The frontend on the other hand will be using javascript, css, html, and bootstrap as the main tools for designing the system. To ensure that the system will provide utmost quality, suitability, and utility in the barangay, the system will undergo a user acceptance testing (UTA) and will be evaluated by different people in the barangay varying in positions, roles, and residents. The criteria for testing will include functionality, usability, performance, security, and compatibility, ensuring that each module operates as intended, is user-friendly, performs efficiently under various conditions, protects sensitive data, and works seamlessly across different devices and browsers. Additionally, feedback from actual users during the testing phase will be gathered to identify any areas for improvement before the final rollout.

List of Deliverables

The project's function and intended outputs and a meaningful explanation are listed below.

1. **Project Proposal Document** - Serves as the foundation of the document, outlining the goals, scope, and significance of the E-Barangay Management System with SMS Notification. It will offer the current challenges faced by the barangay, such as manual

processes and provide a solution framework for the given challenges.

2. **Mockup of the System -** Provides visual blueprint by using Figma for the E- Barangay Management System's design, layout, and User Interface.

3. **Database Scheme -** Provides a layout of the database structure for the E-Barangay Management System. It includes core tables such as the Users(for the residents of the barangay and officials who will be using the system), Requests(for document requests such as certificates and permits), and Notifications(for the SMS Notification logging).

4. **SMS Notification Mockup -** Provides an illustration of the design and content of SMS notifications sent by the E-Barangay Management System. It will show sample messages for various scenarios such as status updates on the request (e.g., certificates, permits), and urgent announcements (e.g., incoming typhoon, evacuation centers, emergencies, etc.).

5. **User Training** - A collection of video demonstrations for the E-Barangay Management System with SMS Notification. Each video will provide step-by-step instructions that will guide the users(i.e.,residents, barangay officials, and barangay officials) through the functionalities of the system such as registering, logging

in, managing resident data, submitting requests, and utilizing the SMS notification module.

6. **Maintenance Plan** - A detailed manual providing guidelines for maintaining the E-Barangay Management System with SMS Notification. It equips the barangay officials with knowledge for managing, optimizing, and troubleshooting the system to ensure its efficiency and smooth operations in future events.

7. **System Backup and Recovery Plan** - A guide providing step-by-step instructions for data backup and recovery for the E-Barangay Management System with SMS Notification. It outlines procedures to safeguard agai`/ N Anst system failures and ensure quick restoration of functionality.

8. **Deployment Plan** - A plan detailing goals for before, during, and after the deployment of the E-Barangay Management System with SMS Notification, ensuring smooth operation of the system.

9. **Progress Plan** - A feedback mechanism for the E-Barangay Management System with SMS Notification that analyzes user feedback from residents and officials to assess satisfaction and system performance, which will be a guide for future improvements and updates.

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Chapter 2 – ANALYSIS OF EXISTING AND RELATED SYSTEMS

Barangay 752 in Singalong, Malate, Manila initially operates on a manual system that poses existing setbacks and potential problems in aiming to provide quality governance and towards managing the community. Analysis will be done in this section on the existing system that the barangay is using and will highlight inefficiencies with regards to the record-keeping, service requests, and the resident communication processes in Barangay 752. With a lack of a digital platform and framework of the barangay, it hinders its ability to serve with better effect the facilitation of their processes in the barangay, which also is an inconvenient issue for the residents. Thus, the solution to provide better access for the barangay and its residents and make processes more efficient and simpler is of great necessity.

Review of Existing System

Figure 1. Context Diagram of the Existing System

Figure 1 presents the context diagram of the current system used by the Barangay 752 for resident profiling, certificate issuance, incident/blotter report

documentation and summary report. It outlines the required inputs and outputs generated by the system.

Figure 2. Diagram 1 of the Existing System

Figure 2 illustrates the flow of processes involved in managing resident information and document issuance in the barangay. The first process is essential for creating a resident profile.It involves the acceptance of resident registration. Residents provide detailed personal information such as their name, sex, address, place of birth, date of birth, civil status, citizenship, religion, occupation, yearly income, and disability status (if applicable).Once the information is collected, it is stored in two formats: an Excel file for soft copy storage and physical copies kept in the barangay office.

For the Certificate Issuance of the Requested Document, residents requesting documents must appear at the barangay secretary to fill out a document request form and must present a valid ID for identity verification. They must state

the purpose of the document request, detailing where or how it will be used. When the request is verified, the barangay secretary prepares the necessary document. The document is then submitted for authentication, where the barangay captain signs it. The system ensures that both unsigned and signed versions of the document are available, confirming that the proper authorization has been applied.

For recording incident/blotter reports, the resident must provide key details such as the name of the complainant, date, time, location, subject, and a full narration of the incident. The information given is carefully stored in an incident/blotter report logbook, which serves as a formal record. The logbook is a reference for any follow-ups or in the event of more significant issues related to the reported incident.

For recording complaint reports, typically used for non-criminal or local issues that residents have, such as disputes between neighbors or noise complaints, the resident must provide key details such as the name of the complainant, date, time, location, subject, and a full narration of the incident. This information is documented in a complaint report logbook, which serves as a formal record and a reference for any follow-ups or further actions required if the issue persists or escalates.

For the generated summary report, the barangay captain can request specific reports based on the barangay secretary given reports. These reports

could include registered resident list, list of document issued and request, list of incident/blotter report, and list of complaints report.. The reports are generated using data pulled from the excel file resident record, document issued/request record, incident/blotter report logbook and complaint report logbook. Ensuring that the barangay has access to accurate and up-to-date information.

SWOT Analysis of the Existing System

Table 1 discusses the strengths, weaknesses, opportunities and threats present in the utilization of the existing system. Both strengths and weaknesses are internal factors that could be addressed inside the organization, while opportunities and threats are external factors that should be considered in order to effectively adapt to the changing needs of every institution.

Table 1. SWOT Analysis of the Existing System

Strengths	Weaknesses
- Reliability and long-standing establishment of the manual system - Recognition and familiarity of operations among barangay staff - Accessible data retrieval through kept documents in the barangay	- Dependence on the manual efforts of barangay staff - Inefficiency and time consumption of manual data entry - Low security for barangay document keeping

Strengths	Weaknesses
- Processes can be modified at will due to flexibility of manual operations - Division of tasks among barangay staff and officials - Offline operability of the manual system	- Vulnerability of important barangay documents to ruin - Higher risk of human and manual process errors - Reliance on third-party software for announcements and other digital media
Opportunities	Threats
- The implementation of a web-system in the barangay - Improved record-keeping by database implementation - Automation and digitization of barangay services made online - Limit the need for face-to-face appointments - Streamlining processes that require other multiple steps - Training and upskilling of staff	- Higher probability of misplacement of documents - Vulnerability to physical alteration, destruction, and theft - Possible conflict with residents due to the time-consumption of manual processes - Difficulty of adaptation by staff in the implementation of a new system - Lengthy training of staff in the new system

Strengths	Weaknesses
	• Transitioning to digital systems can raise potent risks on data breaches and privacy issues

To further review the barangay's framework of operations, the system heavily relies on the utilization of physical documents, paper-based forms, and face-to-face interactions.

Strengths

The system has been employed over a significant duration, reflecting its established presence and sustained functionality. This constitutes familiarity of use over long-term staff and personnel in the barangay and can be easily adopted by the barangay for newly employed personnel. The system also doesn't depend on additional technologies such as the internet. Since the system has been in use for a long period of time, it proves its dependability and reliability among barangay staff. Due to familiarity, the system is also easier to modify depending on the different needs of the barangay and the flexibility of the manual state of operations itself. Additionally, the manual system of the barangay takes into account staff specializations to ensure accountability and quality service provision. The offline operability of the system ensures that the system will continue to function and

guarantee essential services in the barangay without interruptions, considering scenarios such as power outages, internet connection issues, etc.

Weaknesses

The manual state of the system also creates a problem for the barangay. Additional and unnecessary steps are involved with these processes and it consumes plenty of time for the stakeholders interacting with the system. A study published in Quality Magazine indicates that the average error rate in manual data entry is approximately 1%, with some instances showing rates as high as 4% depending on factors such as user fatigue and data complexity (Quality Magazine, 2022). The manual and physical nature of the system also increases the risk of having human-errors which have been proven to be over time. The documents themselves are also prone to ruin due to physical factors, as well as physical theft of documents, decreasing the security level for data-keeping in the barangay. Since there is no existing software that exists for direct announcements to residents; they would have to access third-party software such as facebook in order to post essential announcements. The reliance of the system solely on barangay staff means that the system would only work if there are barangay staff, services may only be done when staff are available and this causes inconvenience to the residents when in need of essential services.

Opportunities

Considering how the manual processes of the barangay affects the security, integrity and the operational efficiency of these processes, the opportunity of converting this system into a web-based electronic system opens up. By exploiting this opportunity to develop the system, data security and privacy are enhanced; documents being digitized increases the security for the data within the barangay, and can be monitored, stored, and accessed remotely, increasing operational efficiency. This also decreases the excessive consumption of paper as documents will now be created digitally, and only occasionally will these documents be needed to be printed. Physical interactions will also be required less as the communication between barangay officials and residents will now be done online, posing an advantage to both parties as communication can now be facilitated through the system to be developed, itself. By allowing the staff to upskill themselves through the use of digital tools and technologies, this can create and smoothen the transition between a manual system to a digital system while also improving the overall efficiency of the barangay system.

Threats

Threats are the possible consequences of what the manual system can accrue, different scenarios come into play when considering the threats that come with the manual system. Due to the manual nature of the system, there is a higher chance of a misplacement of documents by the staff, or the residents, which could be a definite inconvenience to both stakeholders, requiring a do-over of publishing documents and a need to go back to the barangay hall for claiming. Another is

when residents come in together in large groups for a need to request documents and certificates, they'll have to wait for the manual processing of each document; comparing it to a web-system, the system is deliberate in organizing how each requirement will be organized. Once the system is converted to a digital system, problems may arise in terms of employees and personnel in the barangay. There could possibly be resistance issues regarding the conversion of the manual system, which is the longstanding system, into a new web-system and some employees may find it hard to adapt and may result in a lengthy training period for employees that will be using the developed system. Considering as well the phase of transitioning from a manual system to a digital one, the transferring of data from paper to the digital system may pose threats to the security and privacy of data being handled by the staff.

Review   of   Related   Systems

The researcher's goal is to create an appealing design, features, and functionality for the web-based system. The researcher's compile all necessary resources related to our proposed study to help us come up with better ideas. These ideas will support and help the barangay officials on safeguarding all residents' personal data. Additionally, with a specific module assigned to them, it will assist the barangay in producing reports, data, incidents, blotters, and certifications. The associated system review is as follows:

Figure 3. Log-in interface of <u>barangay.net.ph (BeST)</u>

A log-in system is designed to provide residents with secure access to the dashboard of the barangay system, as well as its services and benefits by allowing residents to create and manage their own barangay accounts. This system in particular simplifies navigation for the user, and enhances their experience through a simple and intuitive layout and design.

Additionally, the barangay information system's log-in module ensures proper entry for end-users, including barangay employees, municipal employees, and administrators, in a secure manner. It requires users to input their username and password as a prerequisite for accessing highly sensitive barangay information, which is restricted to authorized personnel only. This module supports diversified user roles—barangay employees manage household and commodity data, municipal employees handle population information, and administrators have full access to all system functions.

Figure 4. Barangay Official Dashboard of <u>barangay.net.ph (BeST)</u>

The user dashboard is the core module of the e-barangay, providing access to the different modules that can be accessed by the administrator in the barangay, providing the administrator oversight and the management capabilities of the entirety of the system. One of the notable qualities of the admin dashboard of BeST

is the ease of navigation for modules such as for resident profiles, barangay services, and the resource allocation of the barangay, all set in clear layout.

This dashboard layout provides the user with the capability to monitor community and demographical data and reports in real time, keeping officials updated regarding the relevant barangay data, enhancing their insight on potential issues within the barangay. This is a crucial factor that the researchers have considered with regards to the development of the E-barangay system as it simplifies administrative tasks and aids the barangay officials to construct solutions and more efficient decisions based on accurate information provided by the data on the dashboard.

Taking this dashboard into consideration for the development of the system, it will be backed up with secure access control and backup protocols, sensitive data will be available to their respective owners while the system provides security to prevent leakage of this sensitized data.

Figure 5. Manage residents profile of <u>barangay.net.ph (BeST)</u>

The purpose of the Manage Residents Profile feature in the e-Barangay module is to help barangay officials create and maintain accurate profiles for

residents. We like this feature because it clearly outlines the essential fields that residents need to fill out, such as their full name, date of birth, gender, address, and family relations. This information is crucial for identification and security purposes.

One of the best functionalities of this feature is that it allows authorized barangay officials to easily access and identify resident profiles. This makes it simpler for them to manage community information effectively. By adopting this interface, we aim to improve data accuracy and enhance communication between residents and officials. Overall, this feature is special because it not only streamlines the process of managing resident information but also strengthens community trust by ensuring that data is handled securely and responsibly.

Figure 6. Profile Management of <u>MITACOR</u>

According to Rjnworks (2024), Resident management in BMS involves maintaining organized records of all barangay residents, including their names, addresses, contact details, and other pertinent information. This feature enables barangay officials to efficiently access resident information, communicate important announcements, and address residents' needs effectively with the information that the resident provided through the system.

By streamlining resident management, BMS facilitates better communication and service delivery, ensuring that all residents are accounted for and can access the assistance and resources they require for a well-functioning community. The user-interface of the system provides a well laid-out design that simply lists down all of the resident profiles that the system has been provided and can be intuitively learned and adapted to by barangay officials.

Figure 7. Quick Search of <u>NSMGS Technologies</u>

The quick search feature of the barangay information management system (*Barangay Information Management System – NSMGS Technologies*, n.d.) applies simple features for it's quick search system; having options including: resident's name, resident code, gender, civil status, citizenship, religion, location, profile status and residency status for filtering the type of result that the user would prefer to receive when searching for needed information.

A study highlighted in an article about effective UX metrics for measuring search bar efficiency indicates that a well-implemented search feature can significantly increase user engagement (What Are the Most Effective UX Metrics for Measuring Search Bar Efficiency?, 2023). This type of quick search interface introduces the user to a more efficient way to search what they are looking for simply with only selecting the type of information they need and the particular data

in the search space on its right, providing efficiency to the search process of the system as well as saving time for users.

Figure 8. Certificate Issuance Module of <u>BAMIS</u>

Certificates issued by the barangay, such as residency or indigency certificates, play a vital role in affirming an individual's identity and socio-economic status within the community. The problem with the process of generating certificates in most barangays is processing time itself that involves extra steps and can pose a hindrance to residents, requiring them to approach the barangay in person when that could be solved by digitizing the process.

The implementation of a certificate issuance module enhances the process of granting certificates to residents; one eminent example would be the certificate issuance module and interface of BAMIS (*Barangay Management System*, 2024), featuring the acquisition of different necessary certificates for indigency, endorsement, residency, barangay clearance, and a barangay summon. BAMIS' certificate issuance module also considers the resident's data with a digital form that they provide in their module. The streamlining of processing of such certificates improves the efficiency of the process, having the resident not be needed to approach the barangay face-to-face for certificate issuance as these certificates can be issued through the system. This solution is a consideration for

the researchers in terms of adopting it for the E-barangay system that will be developed since it converts one vital service of the barangay into an improved one. By leveraging technology to streamline processes and enhance accessibility, the E-barangay system can significantly increase efficiency and responsiveness in serving the community's needs.

Figure 9. Household Module of <u>Barangay Management System by</u>

<u>MITACOR</u>

Rjnworks (2024), a household in the context of Barangay Management System (BMS) refers to a group of people who live together in the same residence or dwelling. This could include family members, relatives, or individuals sharing a living space. Barangay officials maintain records of households within their jurisdiction, which may include details such as the head of the household, the number of occupants, and the address of the residence.

By identifying particular demographic patterns, such as the amount of elderly or dependent family members, officials can create customized support programs and focused interventions that promote community welfare and families' general well-being. The adaptation of this system can be an innovative feature within the system to be developed by the researchers, navigation and information

on blood-relations on residents can be made more efficient, along with a comprehensive verification to ensure that the system maintains accurate records of family members.

Figure 10. Blotter Module of <u>Barangay Management System by MITACOR</u>

Blotters are vital in providing dispute resolution and for reporting incidents within the barangay jurisdiction. Rjnworks (2024), Blotters record in BMS is a log where barangay officials document incidents like accidents, disputes, or complaints within the community. It serves as a reference for tracking case progress, documenting actions taken, and maintaining transparency and accountability in barangay governance.

The implementation of this module is an essential part of the barangay system, making the blotter filing process more efficient for the residents since they will be already provided with an online form to fill out blotter details regarding the complainants, respondents, attackers, victims, and the details of the scene including the location, time, date, and the status of the incident; which are notable considerations that the barangay management system i

Figure 11. Record Generation of <u>NSMGS Technologies</u>

Automated reporting systems significantly reduce human error by eliminating manual data entry (A Complete Guide of Automated Data Reporting | Datylon, 2024). The presence of automated report generation significantly improves the efficiency rate and effectiveness of a barangay system due to the significant reduction. A vital feature of the interface of the barangay information management system's automated report generation is the variety and adjustability of the document that can be generated by the system. The system provides the user ability to decide on the needed data that will be printed on the document. Data that can be included and

Figure 12. Generated Record of NSMGS Technologies

filtered are: birthplace, gender, civil status, citizenship, religion, educational attainment, occupation, location, registered voters, residency status, profile status and even the age range can be defined by the user themselves depending on what they need. After the print function is activated, the system will generate a formal and organized document displaying the information from their selected data with detail. This provides efficiency to the document creation process of systems, automatically generating a document based on a particular format that is determined by the system.

Operational Definition of Terms

- **Barangay:** the lowest territorial entity governed by local government bodies, serving as the primary administrative body of the community and performing fundamental services and maintaining the rule of law.

- **Household:** a group of people who share meals and live in the same housing unit as a social unit.

- **Family:** comprises people who live together and share resources, whether they are connected by blood, marriage, or adoption.

- **Community Services:** Various programs and initiatives provided by the barangay to enhance the quality of life for residents, such as health services, education, and social welfare programs.

- **Barangay Chairman:** is in charge of overseeing local government, enforcing rules, and leading community projects as the barangay's chosen head.

- **Barangay Clearance:** an official document that's provided by the barangay to verify an individual's residency and character within the community.

- **Barangay Officials:** are people who are chosen or appointed to oversee particular operations in the barangay.

- **Resident:** these are individuals who cohabitate in the barangay's jurisdiction and whose presence is acknowledged by the barangay

- **Manual Processing:** this refers to the tasks of the barangay such as certificate processing, blotter recording, etc. that are being done on paper and by handwriting

- **Complaints:** complaints are the reported issues regarding anything within the barangay's jurisdiction

- **Barangay Portal:** it is a web-platform that is operated by the barangay and whose services are provided online by the barangay

- **Web-Based System:** it is a system that is accessed by different users on the internet that is opened on browsers

- **Module:** it is a stand-alone component that contains a part of the system functionality and is actually used in the construction of the system

- **Tracking:** it is the process of monitoring a particular object such as specific data, activity or etc. for a given purpose

- **Reporting:** it is the summarization of specific information in the barangay formulated from the data they hold, and interprets these summaries involving matters related in the barangay

- **Management:** it is the act of leading, coordinating and managing resources towards a more general goal or purpose

- **Certificate:** it is an official document provided by the barangay that informs about the resident's status, condition they are in, or any particular circumstances they are involved in and is commonly needed for legal purposes

- **Barangay Certificate of Residency:** it is a formal document signifying a person's residency in the barangay and their moral integrity

- **Barangay Certificate of Good Moral Character:** a certificate that attests to a resident's excellent moral character and obedience to the law

- **Barangay Business Clearance:** a certificate that is provided to business owners to representing their compliance with the laws in the barangay and represents their authority to operate their business in the barangay

- **Barangay Certificate of Indigency:** it formally certifies that the resident is indigent in the barangay

- **Barangay Summon:** a formal notice that orders a person's appearance in the barangay to appear before the barangay council

- **4Ps Document (Pantawid Pamilyang Pilipino Program):** this is generally a document that is provided in relation to families that are provided cash transfers by the government

- **SMS notification:** short text messages transmitted the user's sim card devices and used to notify residents regarding updates or other important announcements

Chapter 3 – SOFTWARE DEVELOPMENT

The Software Design and Development Approach for the E-Barangay: A Web-Based Management System with SMS Notification will be utilizing a Rapid Application Development (RAD) methodology. RAD requires both the proponent and the barangay's cooperation in implementing this approach, emphasizing the alternation or the cycling between development and user-feedback from the barangay. This approach takes into consideration what the barangay wants ideally for their system and the technical suggestions between the proponents which balances the design and development of the system and making the process efficient, responsive, and collaborative for both the residents and the barangay.

Software Design and Development Approach

This section shows and discusses the overall process flow and the methodology that will be used for the proposed system. The RAD model is ideal for the proposed system because it offers several advantages in terms of speed, reduced cycle time, and minimizes risk of not achieving customer satisfaction. According to Yumhi et al. (2024), RAD allows for faster design, analysis, and implementation of system changes. It allows the developers to make multiple iterations and updates to the software that can adapt without having to start

another schedule again from scratch. This model is designed to facilitate the rapid development of prototypes and ensures that the users can visualize the system while in the early development stage.

Software Process Model

In order to establish a system that directly addresses community requirements, the barangay management system is designed utilizing the Rapid Application Development (RAD) model, which places a high priority on quick development cycles and active user interaction. The four stages of this process—Requirements Planning, User Design, Construction, and Cutover—are all intended to collect input and iteratively improve the system. By including people and barangay authorities at every stage, the RAD methodology guarantees that the end result is user-centered, flexible, and able to effectively improve barangay operations.

Figure 13. Rapid Application Development Model snipped from

blog.spatial.com

The figure above shows that there are four phases in Rapid Application Development. The phases of the Rapid Application Development are:

Requirements Planning

First is the requirements planning, the purpose of the process in which barangay officials were interviewed by the researchers and the researchers determine the scope of the project and who the key constituents are - barangay officials and residents. In this phase, the plan is to interview and gather information from barangay officials. It started by creating questions for the barangay officials and setting a schedule for personal interviews. The questions were based on general questions that are based on what process every barangay has. Moreover, there is a process of surveying and interviewing persons to determine exactly what it is that is needed as far as data management, complaints handling, and requests for services. By involving users at the outset, developers will guarantee that the system they created indeed addresses the real-world challenges faced by the community. This phase will be a crucial point on what modules of the system will be implemented or what data will be collected for the proposed system.

User Design

The User Design phase begins once the requirements are gathered. In this phase, developers create a prototype of what has been gathered during the requirement-gathering process which is the existing system and the processed interview questions. The interface and workflows for the key functions, such as modules that are important and required are mocked up. The modules that are included are Resident Management Module, Blotter Module, Account Management Module, Official Management Module, Family List Module, Certificate Issuance Module, and SMS Notification Module, that came from other

studies and existing systems present today. Through RAD development of the design, users can provide immediate feedback on the proposed design and functionality so that their needs are understood before full-scale development is underway. This would be efficient for a better user design ensuring that the familiar structure is maintained and improved with new features while following the modules that are needed in the proposed barangay system.

Construction

The next phase is the construction phase, wherein the actual system is developed in an iterative manner. The feedback and review are the vital part of the process of construction, it is the main process of how the proposed barangay system will work through the modules that were made from the previous phases. Moreover, the purpose of this phase is to find the potential errors and risks during the development to prevent future complications in the system.

Cutover

The final stage is called Cutover, which would transition from manual ways of getting things done to the new system while improving features of the proposed system. Also, the term "cutover" refers to the finished product being launched that cuts the flaws by process from iterative feedback of the user and improved development. Furthermore, it will cover user training and testing on how to navigate and utilize the new software efficiently while migration of existing data into a new database and implementation into a live environment. This phase aims

to ensure there would be minimal disruption of services using the proposed system in process that allow barangays to benefit from better management capabilities.

Tongkaw et al. (2019) highlight that the RAD model prioritizes a rapid design and development cycle while aiming for high-quality results. There are several fundamental reasons why the RAD model is appropriate for a Barangay Management System. First, the creation of the RAD model places the creator at the center of user needs, which means that users are brought into active participation in the project. The fact that active co-operation between developers and users enhances communication and understanding makes it lead to a more effective final product. Additionally, since the RAD model is capable of rapid prototyping, the users will then see tangible results at a very early stage in the development process, thereby refining the requirements of the system. The flexibility inherent in RAD enables quick adaptations based on feedback or evolving needs, making it quite favorable for dynamic environments like barangays.

Moreover, the RAD model significantly reduces marketing time with the concentration of fast cycles of development. Readiness in essential functionalities is facilitated, and therefore barangays are able to enhance their services with minimal long delays normally characteristic of the traditional models, such as Waterfall generally. According to Melendres and Aranda (2024), after considering the aspects and following the rapid application development (RAD) methodology

their barangay management system was successfully developed. Generally, the steps followed by barangays in requirements planning, user design, construction, and cutover as part of the RAD model would lead to an effective management system whereby service delivery is enhanced whilst responsive to the community's ever-changing needs. This would facilitate better governance through much better access to information and services for the residents, to name a few. It actually improves the efficiency of operations.

System Framework

The goal of the suggested system framework is to lessen the constraints of the barangay's current manual and paper-based processes. This framework describes the structure and functionality of a system intended to implement a digital solution that will improve data management and streamline processes. The framework uses a connected design that optimizes data handling and process efficiency to show how each system component interacts with different user types. The goal of this project is to update the barangay's administrative duties in order to promote a more organized and approachable method of doing everyday business.

Figure 14. Proposed System Framework

As aforementioned, the barangay solely considers initially manual and on-paper processing of data to which the researchers propose a solution of developing a system. The framework illustrates how the system as a means to digitize the processes done only in the barangay hall, will set up the entirety of the system and the relationship between each module and type of user.

The proposed system framework encompasses the primary processes identified by the barangay for conversion into modular components. To access the system's main dashboard, which features all functionalities, residents must establish personal accounts that include their demographic information. These accounts will undergo verification by authorized personnel and a higher-level administrator, who will issue user credentials.

Aside from residential accounts, barangay officials are provided with an account that grants access to almost every module except the barangay official management module. This single account is generally assigned to be provided to the system administrators; official accounts gain access to certain privileges can be adjusted by the administrator account, granting the administrator the capability to tick on and off whatever specific privileges the official account can control.

One of the main modules that residential accounts are provided is the account management module, functioning as a basic means to update the information of each user at their will. Resident accounts are free to update their

passwords, their profiles. This is integrated into the database of the system then reflected in the account management module of the system and can be accessed by officials and the administrator. Updates and reports are generated automatically by the system and will be directed to the administrator account.

The family module will provide each family in the barangay with their respective family assignments, allowing family members to access their personal information, track eligibility for local services, and stay informed about community programs, thereby enhancing engagement and efficiency in barangay administration.

Concerning the online filing of: complaints, incidents, blotters, and the requesting and issuing of documents; to file a complaints or incidents in the system, the user must first fill out the required information included in the form for the given, and this will be transmitted to the official and administrator accounts where the complaint will be assessed; to file blotters, the barangay system will require the user to fill-out a blotter form and it is vital that the blotter form must be filled up the necessary needed information in the system, this form is also directed to officials and the administrator account but will be overseen, processed, and assessed by the secretary of the barangay; to file a request for a certain document, the user must once again fill up a form for what specific document is needed by the user, the form must be filled-up and if any required documents are asked to be submitted, the user must be able to submit or provide the barangay with the

necessary documents in order for the officials, especially the secretary to process their needed documents. All of these will be recorded in the data storage of each resident user for improved accessibility of the system, while some documents will still remain to be issued only by the barangay. The requests and the issued documents are also reported to the administrator accounts exclusively.

The system also concerns itself with the management and the monitoring of barangay officials who are mainly responsible for facilitating the main processes of the system through their official accounts. The administrator account is the only account given access and privilege to monitor the performance of the barangay staff as well as to track their actions in the system, providing insight for the barangay chairman regarding the performance of the overall performance of their officials. The system registers what actions and tasks have been performed and completed by the officials and will reflect on the administrator side of the system, although the module itself will have different levels of access for its users who are the officials and the administrator themselves.

The system also integrates an sms notification system; officials and the administrator are granted access to control the system, input the announcement details and will streamline the sending of announcements to targeted users' sms notifications. Residents are only to receive these notifications from the system.

Data Flow Diagram

A thorough understanding of the management and dissemination of information inside the proposed Barangay Management Information System, including SMS notifications, is given by the context diagram. The system collects data from people, the barangay captain, and the barangay secretary in order to expedite communication amongst important users. Details about resident registration, family profiles, certificate requests, incident reports, and government notifications are all included in the inputs. After processing, the system produces pertinent outputs that are customized for every stakeholder, guaranteeing effective service delivery and communication at all barangay administration levels.

Figure 15. Context Diagram of the Proposed System

The context diagram illustrates the flow of information within the proposed E-barangay management information system with SMS notification. This system takes inputs from residents, barangay secretary, and barangay captain. The inputs, therefore, involve sign-up details, family member lists, requests for documents, complaint details, filing of incidents and blotter details, and announcements or notifications by the latter. After processing the information inputs, it produces outputs for the residents. Residents receive approved account details, announcements, and activity acknowledgments. The provision of SMS notices ensures updates on time and efficiency in barangay services.

Figure 16. Diagram 0 of the Proposed System

Figure 17. Child Diagram 1

Figure 18. Child Diagram 2

Figure 19. Child Diagram 3

Figure 20. Child Diagram 4

Figure 21. Child Diagram 5

Figure 22. Child Diagram 6

Figure 13 illustrates the workflow of the proposed barangay management system, which requires that all the registered and unregistered resident must have an account for interacting with barangay services. The first process is account registration, where a resident initiates the process by visiting the system's website. The resident must provide essential information, including full name, contact details, email address, password, and valid ID. Upon submission, the barangay secretary reviews and approves the account request. Once approved, the system sends the username and password to the resident via SMS, enabling access to various services offered by the barangay.

Following account activation, the next step is resident family member registration. Using the family list feature, residents can list all family members by completing a detailed form with required information, such as full name, role, cellphone number, and sex. The barangay secretary review the submitted details for verification, and once approved, residents are notified of the status of their registration via SMS.

The third process is the barangay certificate request. Residents can request barangay-issued certificates by submitting a form that includes their personal information, the type of document required, the number of copies, the purpose of the request, and the preferred mode of document collection. For documents that require a fee, payment must be made in person at the barangay hall. Once the request is submitted, the barangay secretary processes it, and the document is signed and sealed by the barangay captain for official issuance.

The fourth process, incident reporting, allows residents to report incidents directly to barangay officials. Residents fill out a form detailing the incident, including the date, time, location, the subject of the complaint, names of those involved, supporting evidence, and a narrative description of the event. Once submitted, the system notifies the complainant via SMS and records the incident in the database for further action by barangay officials.

The fifth process, Report Generation, is used by barangay officials, such as the barangay captain, to generate various reports, including population reports, incident reports, and certificate issuance reports. The system retrieves and compiles relevant data from the stored records to produce accurate and up-to-date reports for administrative purposes.

Lastly, sending notifications enables barangay officials to disseminate important announcements and notifications to registered residents. The notifications in the system may be done immediately or scheduled at a certain date before it is posted. Notifications may also be targeted to the general community of the barangay or to all residents, or can select only a specific audience to reach and receive the notifications or announcements. The details of the announcements will be stored within the announcements database.

E-R Diagram

The Entity-Relationship Diagram (ERD) presented is a structural blueprint for a barangay management system. The ERD keeps the organization, management, and record-keeping related to pertinent data concerning residents, barangay officials, incidents, notices, or other important barangay activities. Each "entity" shows a specific category of information, such as residents or incident reports. The relations of these entities also show how different data types are interrelated to give a unified structure that supports the effective and organized administration of barangay operations.

Figure 23. Proposed Entity Relationship Diagram

The core of the system is the RESIDENT entity, which is an all-inclusive repository for the personal details of barangay residents. This entity stores identification details, such as Resident ID, family associations, and a range of personal information including names, birth date, place of birth, contact information, and demographic data. Each household head is associated with a FAMILY entity through his/her Family ID, and these households can further be aggregated with each other in order to form more groups or even family ties of the residents. In the FAMILY entity, a family specific representation in the community is delivered in terms of representative details, composition of the house, and level of income.

The ACCOUNT entity stores the login credentials that consist of email, password, and cellphone number, which make secure access possible for residents to the system. It makes the connection to the RESIDENT entity possible and thus makes it possible for the resident to interact with the system regarding services such as requests for certificates and inquiry services. The CERTIFICATE ISSUANCE entity directly links the residents and captures official requests for certificates and provides the details such as type, purpose, and the amount paid. The OFFICIALS entity is also connected because barangay officials typically authorize and issue these certificates.

The OFFICIALS entity is the nerve of barangay administrative operations. It keeps records regarding the barangay officials concerned, including identifiers

such as Official ID, position and term dates. This one is complemented by another, the ACCOUNT entity, which records login credentials for officials only so that sensitive actions in this system can only be done by authorized personnel. The entity ACTIVITY LOG is connected to the ACCOUNT in logging official activities, whereby auditing would be possible, hence transparency and accountability on certain matters. Every action logged contains a kind of activity, date, time, and description; therefore, there will be an easy track and monitoring by the barangay of what actions are done by the officials and adherence to procedural standards.

Officials of the barangay play a very significant role in handling cases for incidents and complaints reported. For instance, there are entities such as INCIDENT REPORT and COMPLAINT REPORT. The INCIDENT REPORT entity was able to capture reports of events, which can be described in terms of the time and date it occurred, location, subject, complainant, evidence, and people involved. The COMPLAINT REPORT entity deals with complaints filed by different kinds of people in the barangay, and it describes the date it was filed, description, and its status. These reports are linked to the OFFICIALS and RESIDENT entities, which relates each report to the respective complainant or respondent, as well as the respective officials to whom the case is forwarded.

The other important entity in the ERD is the BLOTTER REPORT, which is an official record of legal or significant incidents that happened within the barangay. It contains case numbers, subjects, complainants, respondents, and

descriptions of each incident. Legal implications usually characterize the incidents included in the blotter reports, hence its significance to the maintenance of law and order in the community. The system associates each blotter report with the people involved and the barangay officials overseeing the case by linking to both OFFICIALS and RESIDENT entities.

The system features, other than reports, a ANNOUNCEMENT entity, which facilitates the announcement within the account of the residents and officials or the main homepage of the website. Such announcements could be directed towards the dashboard of the specific update request or any sort of message is addressed to them. This entity may be associated with the account ID of the Accounts Table, which would be an optional connection used to monitor the announcement rendered to the officials. The ANNOUNCEMENT captures the recipients, schedule, and status of all announcements so that critical information gets to the right people at the right time.

This produces a very connected system through which data can easily pass from residents, officials, accounts, and reports. Connecting entities through unique identifiers like the Resident ID or Official ID ensures that the data is kept intact and every aspect of a resident's or official's interaction with the barangay administration is made visible. The connectedness helps in the efficient retrieval of records, smooth incident tracking, and transparent management processes.

The system incorporates several tables to manage user roles, permissions, and payment types. The ROLES is what differentiate the user roles with each unique Role_ID and Role_name. The PERMISSIONS lists all possible permissions and is identified by a Permission_ID, Permission_name, and Category. The ROLE PERMISSIONS acts as a bridge between roles and permissions that links Role_ID and Permission_ID. Also, including an Is_enabled field to show and specify which permissions are active for each role. This setup allows the system to assign and control user access based on their designated roles.

The PAYMENT TYPES manage and create the various payment options that can be created in the system, with table fields such as Payment_Type_ID, Name, Type, Status, QR_Photo, Account_Name, and Created_At. This structure helps the system to support different types of payments, tracks the status, and provides necessary accounts for transactions and other details. .

Furthermore,the EVIDENCES stores details regarding a user's complaint reports or incident reports, as well as blotters. The fields include Evidence_ID, Case_ID, Incident_ID, Complaint_ID, Evidence Description, Evidence_Picture, and date_and_time_created. This structure will also be helpful for handling many evidences based on their reports. The tables makes use of IDs to connect to any report details with organization and ensure that each report links and is identified within the system.

Lastly, the Role_ID from the Roles Table is connected to the Accounts Table that assigns each user account a specific role. This association determines

the permissions that will be available and access levels for each user, this will ensure secure and efficient management of system process functionalities.

In conclusion, this ERD represents a structured and robust barangay management system that organizes data handling, openness, and accessibility. As it captures and connects information on residents, officials, incidents, and certificates, the system is a mighty tool for barangay administrators to manage community needs and ensure accountability and accuracy in its data. This setup and process not only enhances the operational efficiency but also improves governance and fast transactions, allowing the barangay to respond effectively to incidents, address complaints, handle documents issuance and maintain a strong record-keeping framework.

Table Normalization

A thorough understanding of the management and dissemination of information inside the proposed Barangay Management Information System, including SMS notifications, is given by the context diagram. The system collects data from people, the barangay captain, and the barangay secretary in order to expedite communication amongst important users. Details about resident registration, family profiles, certificate requests, incident reports, and government notifications are all included in the inputs. After processing, the system produces pertinent outputs that are customized for every stakeholder, guaranteeing effective service delivery and communication at all barangay administration levels.

Figure 24. Proposed Table Normalization

The normalization shown above is based on ERD for a barangay management system that uses the data in separate related tables to reduce redundancy and preserve the integrity of the data. The tables represents a distinct categorories, such as residents, family details, officials, reports, and certificates, capturing unique information without duplication. A table like Resident, Family, and Officials contains core information, while related tables, such as Resident Account and Officials Account, carry login information separately, further improving security. Reports of incidents and complaints are also included in the table, this time using their respective IDs to residents and officials, making it easier to follow and control every case included in the system. Since relations are applied among tables, consistency is obtained, which is why easy retrieval can be assured in the information of the barangay thus making the system more orderly, expandable, and maintainable.

Constraints and Assumptions (5 M's and T)

"Managing assumptions and constraints is necessary to complete your project with minimal obstruction" (Usmani, 2022). Constraints in a project are vital factors to determine the goal of a project, setting up the boundaries and the restrictions of a project. Assumptions on the other hand, are conditions concerning the project that are presumed to be true and must have a realistic basis, otherwise miscalculations may occur where problems in the project may arise; thus, the

necessity to control these factors. For each constraint present are risks associated; risks are the possible consequences that may arise during the development of the project and may hinder the researchers to accomplish their goal at their desirable pace. Minimizations are the strategic solutions to which risks are minimized, and must be analyzed and set up meticulously in order to reduce the probability of risks to occur. Controlling and full-understanding of these vital factors are requisite to the success of the project.

Table 2. Constraints, Assumptions, Risks and Minimization Measures

Constraints	Assumptions	Risks	Minimization
Materials	The proponents are capable of acquiring necessary materials for the construction of the system.	The setup of the barangay including necessary peripherals and secure enclosures that could harm the machinery, along with the lack of a solid internet connection may result in hindered processes of the system.	Choosing a suitable ISP that's generally accepted to provide better connection within the area by surveying locals with an internet connection. Hazards must be inspected in the computer area, especially if there's only one computer.

| Machinery | The system works well with the computer hardware of the barangay and can process smoothly as it was developed. | The computers of the barangay have outdated specs and are unable to run the developed system. | The software developed will be minimized to match the processing capabilities of the computer of |
| Methods | The development team will adhere to an efficient project management process. | Deviating from the following methodologies may lead to inefficient progressions in the system development. | Ensure the developers will follow the process by constant monitoring and checking of each work. |

Money	The proponents have enough financial ability to provide sufficient funding of the project.	The barangay might have shortages in the project budget.	Budget must be allocated based on the priority and necessity of the material. Outsourcing for the material must be done as well to ensure cost-effectiveness.

Manpower	The development team is capable of coordinating each task well with each other and have the sufficient skills to accomplish it on time. The barangay as well is able to cooperate all throughout the time allotted for the project.	Members of the development team fail to continue in developing the system causing a major decrease in productivity of the project. The barangay may also not agree to continue with the project.	Task assignments must be based on each member's strength to ensure the effectiveness of their performance and quality of result. Ensure that there is proper management in the team working environment to enhance working efficiency.
Time	The time allotted to accomplish the development of the system would be sufficient for the development team.	Development of the system would not be accomplished on time.	Proper time management, adjustments and proper communication.

Project Schedule

Table 3. Gantt Chart

Table 4. PERT Table

Figure 25. PERT Diagram

Testing and Evaluation Procedure

The e-barangay management system will undergo testing and evaluation to ensure all components, particularly the barangay's needs, are satisfied. The e-barangay management system also includes software testing to guarantee the system's efficiency and effectiveness throughout the process.

Steps in conducting the testing

To effectively conduct testing for the E-Barangay: A Web-Based Management System with SMS Notification, several key steps and types of testing should be implemented. We are using this three essential types of testing involved in the process: Unit testing, Integration testing, and User Acceptance Testing (UAT)

Unit Testing

This initial phase focuses on testing individual components or modules of the system to ensure that each part functions correctly on its own. Testers will create specific test cases for each unit, verifying that they perform as expected without any errors.

Integration Testing

Once unit testing is complete, integration testing is performed to assess how well the different modules of the system work together. This step ensures that data flows seamlessly between components, such as when a resident submits a request for a certificate and the system updates the database accordingly.

User Acceptance Testing (UAT)

The final phase involves users, which are the barangay officials and residents, testing the system in a controlled environment. Their feedback is crucial as it evaluates the system's usability and overall functionality in real-world scenarios. This step helps identify any issues that may not have been caught during previous testing phases and ensures that the system meets user expectations.

The develop system will be tested by the following individuals:

- **Proponents -** These are the researchers who are responsible for the overall system testing of the system before releasing the system to the users.

- **Barangay Residents -** These are the end-users of the system; the residents will provide feedback on the functionality, usability, and performance of the system for the residents interface.

- **Barangay Officials -** The barangay officials are the primary user of the system; the officials will provide feedback on the functionality, usability, and performance of the system for the admin and resident interface.

Table 5. Rating, Range and its Verbal Interpretation

Rating	Range	Verbal Interpretation

5	4.51 – 5.00	Highly Acceptable
4	3.51 – 4.50	Acceptable
3	2.51 – 3.50	Moderately Acceptable
2	1.51 – 2.50	Slightly Acceptable
1	1.00 – 1.50	Not Acceptable

Table 5 presents ratings that range from 1 to 5, with 1 indicating the lowest acceptability and 5 representing the highest. A rating of 3 signifies a neutral interpretation. The proponents will carry out an evaluation involving direct users based on the following criteria:

1. **Functionality** - The functionality refers to the uses of the modules within the system, including features such as complaint management, document generation.

2. **Maintainability** - This assesses how easily the system can be fixed and maintained when possible failures and errors occur to minimize downtime and ensure continuous service.

3. **Security** - This refers to the security of the data to ensure its integrity, confidentiality, and availability of information.

4. **Usability** - It evaluates the user-friendliness of the system ensuring that both residents and officials can use the system without confusion.

5. **Reliability -** Reliability measures the system's ability to perform consistently over time without failures. This assessment approach ensures that the e-barangay management system effectively satisfies user needs by offering a thorough overview of all critical components.

Statistical Treatment of Data

The statistical techniques used to examine the respondents' ratings are described in this section. Using statistical tools is important to turn raw data into useful insights, which helps in making informed decisions based on evidence. The statistical tool we use is the mean, which shows the average rating. This formula helps us find the average rating from all the respondents, giving us a clear understanding of their overall feedback.

The formula to calculate the mean:

   Mean = Sum of Respondents' Ratings / Total Number of Respondents.

Evaluation Sheet

E-Barangay Management Information System

for Barangay 752 with SMS Notification

Name (Optional): _____ **Position:** _____

Date Administered: _____ **Time:** _____

Instruction: Please evaluate the system by using the given scale and

placing a checkmark (✔) under the corresponding numerical rating.

Numerical Rating	Description
5	Highly Acceptable
4	Acceptable
3	Moderately Acceptable
2	Slightly Acceptable
1	Not Acceptable

Software Criteria	5	4	3	2	1
A. Functionality					
1. The system allows for efficient data entry and retrieval.					
2. The system effectively sends timely notifications to users.					
3. Requesting and tracking certificates is straightforward, making it quicker					
4. The system makes it easy for users to send in complaints and feedback, helping things get handled smoothly.					
5. Users can check on the progress of their complaints, and updates are shared to keep everything open and clear.					

B. Maintainability					
1. The system is easy to maintain and update.					
2. Technical support is effective and responsive.					
3. The system is responsive and performs well under varying loads of user activity.					
4. The error handling mechanisms in the system facilitate quick resolution of issues.					
5. The system provides adequate resources (e.g., help guides, FAQs) to assist users in understanding its functionalities during updates.					
C. Security					
1. The system adequately					

protects sensitive user data.					
2. Access controls are effectively implemented to restrict user permissions based on roles.					
3. The system provides sufficient logging and monitoring features to track usage and identify potential threats.					
4. There are effective backup procedures in place to protect data from loss or corruption.					
5. The system effectively stores user data privately, ensuring that it is accessible only to the user and that passwords are not visible to any unauthorized personnel.					
D. Usability					

1. The system modules are easy to use and can be intuitively learned.					
2. The user interface is intuitive and easy to navigate for all users.					
3. The system provides clear instructions for using its various features.					
4. Users can easily find what they need.					
5. Overall, users are satisfied with their experience using the system.					
E. Reliability					
1. The system consistently operates without any errors or outages.					
2. The system provides accurate and timely data					

without frequent errors.					
3. The system delivers efficient services that meet residents' needs and enable smooth communication with barangay officials.					
4. User requests are processed accurately and efficiently by the system.					
5. Users can depend on the system to deliver timely updates and notifications regarding their requests.					

Summary	Average
A. Functionality	
B. Maintainability	
C. Security	
D. Usability	
E. Reliability	
OVERALL AVERAGE	

_____

Signature of Evaluator

Chapter 4 – RESULTS AND DISCUSSION

This chapter contains the final outcome of the developed system for Barangay 752 Zone 81 Malate, Manila. It includes the resident interaction, document approval or disapproval of request, announcement through sms, file a complaint and incident report. It also includes the proof of the developed system by providing some screenshots.

Developed Project

Barangay 752 Information Management System is a web-based system that developed by the 3rd year Bachelor of Science in Information Technology students of University of the East Manila to help the barangay officials to organize and maintain resident records, handle document request , filing of reports (e.g., blotter, complaint and incident), receive announcement on time and generate monthly or yearly reports through pdf and excel export.

Features and Capabilities

The developed system aims to help the barangay officials satisfy their problem in resident and document management that can lead to information loss.

It also reduces overuse of paper. The features and capabilities of the developed system are listed below.

Figure 26. Landing Page of Barangay 752 Information

Management System

The landing page contains whereby the residents are able to view necessary announcements connecting different events of the barangay. The other information includes the history of the barangay, its mission, and vision. There is also a photo gallery that displays community events and programs conducted in the barangay. It also highlights services offered through online applications including certificate issuance, incident report, and complaint filing. Another feature is the presentation of the barangay organization chart with the current official list for the present term. The website also includes some key modules for About Us, Services, Login, and Register.

Figure 27. About Us Section of Home Page

Visitors to the homepage of the system are presented with the barangay's introductory information, it can also direct the user to the about us page by clicking on the learn more about us button.

Figure 28. Council Leadership Team Section of Home Page

Visitors of the home page of the system are introduced with the barangay's council leadership team, containing the people who are associated with the barangay roles such as the punong barangay, sangguniang barangay members, barangay secretary etc.

Figure 29. About Us Page

Visitors of the home page of the system are introduced with the barangay's history, mission and vision, and the photo gallery of the barangay.

Figure 30. Services Page

In this section, visitors may view all barangay services offered through the online application of documents; this also gives the barangay office hours to inform its residents during what time the barangay is available.

Figure 31. Account Registration Page

Visitors of the home page are granted access to create and register their accounts to access the services that the barangay system provides. This feature makes the data collection process of the barangay more efficient since account registration also translates to resident data collection and management.

Figure 32. Login Page

This feature and module contains a single interface for all users with the option however to login as either a resident or official, conditionally logging the user as their selected user type or role if only they do have access to both roles. The process makes it efficient for both user types to manage both official side and resident side services without the need for different login page interfaces.

Figure 33. Forgot Password Page

Users who are verified by the system are given the chance to retrieve their account information by presenting them with the field to input their phone numbers in order to find their user accounts.

Figure 34. Residents Dashboard

After log in, users are presented with the services of the barangay in the form of the sidebar navigation. The dashboard itself provides the announcement notifications from the barangay administration, reflecting on the main page screen of the resident users. A small button on the top left also provides users of a way to log out and view their profiles as well.

Figure 35. Resident Document Request

This feature allows resident users to access the document requesting service of the system, making the document requesting service both more convenient and efficient for the resident users.

Figure 36. Resident Report Filing

This feature allows resident users to file complaints and incidents only to which will be received by the barangay administration.

Figure 37. Account Profile

This feature allows resident users to edit the information that they are using in the system e.g. usernames, passwords, even change the photo that they are using in the system allowing for user customization and easier identification of accounts.

Figure 38. Barangay Administrator Dashboard

This feature gives barangay administrators and barangay officials a clear overview of the system. It shows the total number of registered residents, including those recently added, and makes it easy to track all pending documents and reports. It also displays the latest announcements sent by residents. When an administrator clicks on any piece of data, the system allows them to export the information as a PDF or Excel file.

Figure 39. Residents List

This feature is for barangay administrators and officials to view information about all residents in their area. It shows all the important details about each resident and makes it easy to search and find people quickly. Officials can also view each resident's records to keep information accurate and current.

Figure 40. Senior Citizen List

This feature allows barangay administrators and officials to view a list of all senior citizens in their locality aged 60 and above. This helps keep track of vital information pertaining to each senior barangay resident. There is also a search icon that would allow one to easily find a specific person or sort the list according to other attributes. This application facilitates officials in giving service and support to senior citizens because information is well arranged and easily accessible.

Figure 40. New Resident List

This feature allows barangay officials to add new residents to the system. Once a registration is approved, the new resident must have lived

in the barangay for at least six months before they can be added to the official resident list.

Figure 41. Barangay Official List

This feature is made to help the barangay administrator manage the information of barangay officials. They can update or change the position and status of each official whenever needed to keep the records accurate and up to date. At the same time, it lets the barangay chairman easily access and view the complete list of all officials who are serving during the current year's term. Each official's name and profile picture are shown clearly, making it easy for anyone to know who holds each role. This list can also be shown on the barangay's home page, so residents can quickly find and learn about the people leading their community.

Figure 42. Family List

This feature allows the barangay administrator to facilitate assigning and managing family data in the barangay, considering family names and family members which aids in data clarity regarding families in the barangay.

Figure 43. Resident Account List

This feature allows barangay administrators to view all the pending registration details and must review all the important information including the proof of identification. Once approved, the resident will receive a sms notification that contains their username and password that can be used for logging in the system. If rejected, the resident will receive a sms notification regarding the disapproval of their account together with administrator remarks.

Figure 44. Barangay Official Account List

This feature is designed for barangay administrators to create user accounts specifically for barangay officials. When an account is created, the official's information is automatically added to the official list, which is then shown on the barangay homepage for residents to see. The administrator can also manage these accounts by revoking access or removing any official from the list if needed. This helps keep the list accurate and ensures that only current officials are displayed.

Figure 45. Permit Request List

The feature allows barangay admins and officials to view all residents' requests for permits. It presents details such as the resident's name, permit requested, date of request, purpose of request, and current status whether pending, approved, disapproved, or issued. This list helps the officials keep track of and manage all requests. Once the permit is approved, the barangay official can issue the document, advising the resident of the status.

Figure 46. Clearance Request List

This feature allows barangay administrators and officials to view all clearance requests made by residents. Important details such as the name of the resident, the type of clearance, date of the request, purpose, and current status (pending, approved, disapproved, issued) are included. This list is of great help for officials in keeping track of every request and handling it smoothly. An approved clearance can then allow barangay officials to issue the document and inform residents about its status.

Figure 47. Certificate Request List

This feature is for all the barangay officials in processing certification requests from the residents. The feature enables keeping track of particulars like the name of the resident, the type of certificate they requested, the date on which the person requested for it, the reason for the request, and the status pending, approved, disapproved, or already given. The list helps the officials keep track of all requests and process them faster. By that time, the official can prepare certificates, and the resident would be notified that it is already ready for pickup.

Figure 48. Blotter Report List

This feature is for the barangay administrator, chairman, and secretary. It helps them manage blotter reports made by residents. All reports are shown in a clear list, so officials can easily see and check the status of each one. They can take action to solve the issues and officially close the report once it's resolved.

Figure 49. Complaint Report List

This feature will help the barangay administrator, chairman, and secretary to look at all complaint requests made by residents. The list gives

detailed information about each complaint and its current status. The officials may see each case follow up as required, and mark complaints as resolved or closed when they are finished with them.

Figure 50. Incident Report List

This function is designed to help the barangay administrator, chairman, and secretary stay organized by keeping a complete record of all incident reports from the community. It provides detailed information about each incident, including when and where it happened and what the issue is. With this, the officials can easily monitor the progress of each case, follow up on ongoing concerns, and make informed decisions on how to address and solve the problems.

Figure 51. Announcement List

This feature allows Barangay Officials to send out important updates and announcements directly to the residents using sms notification. This feature helps to announce important information about events and programs held in the barangay.

Figure 52. Template List

This feature enables the barangay administrator to upload and manage frequently issued barangay documentation such as Barangay Certificate, Barangay Clearance and Barangay Permits. The use of these templates guarantees format uniformity and speeds document generation. The barangay administrator can also upload a GCash QR Code into the system. Thus, residents can directly use this QR code to pay for the requested documents (e.g., business permits) with no need for in-person transactions to create a more cashless, efficient process.

Figure 53. Roles and Permission

The administrator can assign or alter role permissions for each user registered in the system (e.g. chairman, secretary, staff). This ensures that users will only be able to access the features of their role, helping keep security and workflow.

Testing and Evaluation Results

Users of the developed system were surveyed by the proponents. This part displays the respondents' findings, and it is necessary to determine whether the system was able to satisfy the user's expectations and the content, functionality, reliability, availability, and maintainability of the system.

Table 6. Testing and Evaluation Results

Respondent	Position	Functionality	Maintainability	Security	Usability	Reliability
1	Punong barangay	5	4	4.4	4.4	4.6
2	Barangay Secretary	5	5	5	5	5
3	Barangay Treasurer	5	5	5	5	5
4	Kagawad	5	5	5	5	5
5	Kagawad	5	5	5	5	5
6	Kagawad	4.4	5	4.6	5	5
7	Kagawad	4.2	5	5	5	5
8	Kagawad	4.6	5	5	4.4	5
9	Kagawad	4.8	5	4.8	4.8	4.8
10	Kagawad	4.4	4.4	4.6	4.6	4.6
11	Kagawad	5	5	5	5	5
12	Sk Chairperson	5	5	5	5	5

13	Resident	4	4	4	4	4
14	Resident	5	5	5	5	5
15	Resident	5	5	5	5	5
16	Resident	3.6	4	4	4	4
Average		4.69	4.78	4.78	4.76	4.81
Weighted Mean: 4.76						
Verbal Interpretation: Highly Acceptable						

The table above showcases the comprehensive ratings given by the (1) punong barangay, the (1) barangay secretary, the (1) barangay treasurer, (8) sangguniang barangay members also known as kagawads, the (1) sk chairperson, and (4) residents.

Functionality

The average score for the functionality of the system is 4.69 which is a highly acceptable score in the metric, indicating that the system's functionality meets the expectations of the barangay.

Maintainability

The system has a high score of 4.78 on the maintainability metric, which indicates that it is a manageable system as per the standards of the evaluators.

Security

The evaluators had deemed the security of the system to be secure, securing an average score of 4.78 which is a considerably high score in the evaluation instrument of the system.

Usability

With regards to the usability of the system, it poses a score of 4.76 which is a great indication of the effectiveness of the system design and logic flow, rendering it efficient for users in the barangay.

Reliability

The average score provided by the respondents was 4.81. This demonstrates how consistently the system's design monitors its overall operation and condition.

Weighted Mean and Verbal Interpretation

The developed system had received a score of 4.76 as its weighted average in a 5 point metric evaluation tool, its verbal interpretation indicates that it is a highly acceptable system as per the evaluator's judgement and is a suitable system for the barangay's use, passing the acceptability at a high rate.

Deployment Procedure

With the conclusion of the testing, simulation, and the evaluation of the web system provided by the proponents, the system will be deployed to the barangay for system integration and use monitoring. A user-training plan, and user manual will be provided to the barangay for instructional purposes and to make sure that the administrators are familiar with how the system will be working and how the barangay staff will be managing the system.

Hardware / Software Requirements

Hardware Requirements

- Peripherals
    - Mouse
    - Keyboard
    - Printer
    - Monitor
    - Mobile Phone
- Minimum System Specifications:
    - Processor: Dual Core
    - RAM: 4GB
    - Storage: 128GB SSD
    - Internet Connectivity: Ethernet 10Mbps
- Recommended System Specifications:
    - Processor: Quad Core
    - Ram: 8GB

○ Storage: 256GB SSD

○ Internet Connectivity: Ethernet 20-50Mbps

Software Requirements

Minimum Requirements

- Operating System:

    ○ Desktop: Windows 10

    ○ Mobile: Android 10 / iOS 14

- Web Browser: Microsoft Edge or Firefox

- PDF Reader:

    ○ Desktop: Built-in browser viewer (Microsoft

      Edge or Firefox)

    ○ Mobile: Adobe Acrobat Reader

- Excel/Spreadsheet:

    ○ Google Sheet

Maximum Requirements

- Operating System:

    ○ Desktop: Windows 11

    ○ Mobile: Android 13 / iOS 16

- Web Browser: Google Chrome or Firefox

- PDF Reader:

    - Adobe Acrobat Reader

- Excel/Spreadsheet:

    - Google Sheet

Hosting Plan

- The proponents will identify appropriate areas inside the Barangay Hall or office where the computer/s used for system access will be installed.

- The proponents will check and confirm that the hardware is working properly before system setup.

- The proponents will ensure that the Barangay Management System is installed correctly and is accessible from authorized devices.

- The proponents will verify that the hosting server is stable, fast, and capable of handling the expected number of users.

- The system must update information in real-time to ensure smooth operations for citizen services and record management.

- The proponents will check that the website remains responsive during peak usage hours (e.g., registration events, community announcements).

- The proponents will ensure that the hosting service has minimal downtime and can maintain consistent access to the system.

User Training Plan

- Introduction of the system to the barangay staff and how it improves their processes

- Compare and contrast the old manual system that the barangay has been using

- Discuss how the system works: explaining each module and capability of the developed system

- Conduct a hands-on training session for the barangay staff in order for them to simulate the system and familiarize themselves with the processes of the system

Costing Plan

    The computers and laptops that were utilized to build the system include The costing plan does not include it because it is owned by the proponents. Costs for the domain and web host are included in the bill.

Table 7. Project Costing

ITEM	COST	QUANTITY	TOTAL COST
Web Hosting (12 Months)	₱1,788.00	1	₱1,788.00
SMS API Service	₱2,800.00	1	₱2,800.00
Total		**2 Items**	**₱4,588.00**

User   Manual

In order to be aware of the system that was built, the proponents a user's guide that includes all the necessary details regarding the way the developed system works. Additionally, the proponents provide both digital and hard copies of the company's user manual.

User's Manual

BARANGAY 752 WEBSITE

USER'S MANUAL

VERSION 1.0

REGISTRATION MODULE

RESIDENT - HOW TO ACCESS REGISTRATION PAGE

Step 1: On the Home Page, click "REGISTER NOW!" button

Other way to access it:

Option 1: On the Login Page, click "REGISTER".

RESIDENT - HOW TO REGISTER ACCOUNT

Step 1: On the Home Page, click "Register now".

Step 2: Check Data Privacy Act of 2012 permission.

Step 3: Click "Submit" to proceed.Step 4: Fill out your personal information and complete all required fields in the registration form.

Step 5: Click "Submit" to finalize your registration.

Step 6: You will instantly receive an SMS notification containing your Username and Password.

LOGIN MODULE

RESIDENT - HOW TO LOGIN YOUR ACCOUNT AS RESIDENT

Step 1: On the Login Page, enter your Username and Password

Step 2: Click "Login" to proceed.

Step 3: You will be redirected to the Resident Dashboard Page.

BARANGAY OFFICIAL - HOW TO LOGIN YOUR ACCOUNT AS BARANGAY

OFFICIAL

Step 1: In Login Page, select your role to log in on and enter your username and

password.

Step 2: Click "Login" to proceed.

Step 3: You will be redirected to the Barangay Official Dashboard Page

.

RESIDENT - FORGOT PASSWORD

Step 1: On the Login Page, click "Forgot Password".

Step 2: Enter your phone number.

Step 3: Click "Submit".

Step 4: Enter your 6 digits One-Time Password(OTP) sent to your phone.

Step 5: Click "Submit".

Step 6: Enter a new password.

Step 7: Confirm your new password.

Step 8: Click "Submit" to complete the password reset.

RESIDENT - FOR PENDING ACCOUNT

Step 1: On the Login Page, enter your Username and Password.

Step 2: Click "Login" to proceed.

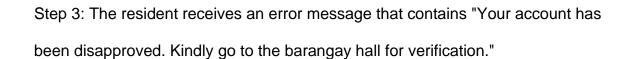Step 3: The resident receives an error message that contains "Your account is

pending. Please wait for activation."

RESIDENT - FOR DISAPPROVED ACCOUNT

Step 1: On the Login Page, enter your Username and Password.

Step 2: Click "Login" to proceed.

Step 3: The resident receives an error message that contains "Your account has

been disapproved. Kindly go to the barangay hall for verification."

RESIDENT DASHBOARD - HOME PAGE

RESIDENT - HOW TO VIEW HOME PAGE

Step 1: Click the "Home" in the navigation bar.

Step 2: Click the "Account" button if you want to go back to RESIDENT

DASHBOARD.

RESIDENT DASHBOARD - VIEW PROFILE

RESIDENT - HOW TO VIEW PROFILE

Step 1: Hover your mouse over in the top right corner and click your full name

icon.

Step 2: Click "View Profile".

RESIDENT - HOW TO CHANGE PASSWORD

Step 1: Hover your mouse over in the top right corner and click your full name icon.

Step 2: Click "View Profile".

Step 3: Enter your current password.

Step 4: Enter your new password.

Step 5: Click "Save Changes."

RESIDENT - HOW TO CHANGE PROFILE PICTURE

Step 1: Hover your mouse over in the top right corner and click your full name

icon.

Step 2: Click "View Profile".

Step 3: Click "Choose File".

Step 4: Upload your picture.

Step 5: Click "Save Changes".

RESIDENT - HOW TO VIEW RESIDENT INFORMATION

Step 1: Hover your mouse over in the top right corner and click your full name icon.

Step 2: Click "View Profile".

Step 3: Click the "Resident Information" tab.

RESIDENT - HOW TO EDIT RESIDENT INFORMATION

Step 1: Hover your mouse over in the top right corner and click your full name icon.

Step 2: Click "View Profile".

Step 3: Click the "Resident Information" tab.

Step 4: Click any fields you want to change.

Step 5: Click "Save Changes".

RESIDENT DASHBOARD - REQUEST PAGE

RESIDENT - HOW TO REQUEST A DOCUMENT

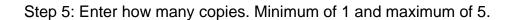Step 1: Click "Request" in the navigation bar.

Step 2: Click "Request Document" .

Step 3: Select any type of document.

Step 4: Enter your purpose.

Step 5: Enter how many copies. Minimum of 1 and maximum of 5.

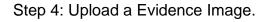## RESIDENT DASHBOARD - REPORT PAGE

RESIDENT - HOW TO FILE A COMPLAINT REPORT

Step 1: Click "Report" in the navigation bar.

Step 2: Select "Complaint" in the type of report.
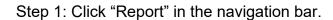
Step 3: Fill out your Complaint Details.

Step 4: Upload a Evidence Image.

Step 5: Click "Submit Report".

RESIDENT - HOW TO FILE A INCIDENT REPORT

Step 1: Click "Report" in the navigation bar.

Step 2: Select "Incident" in the type of report.

Step 3: Fill out your Incident Details.

Step 4: Upload a Evidence Image.

Step 5: Click "Submit Report".

Chapter 5 – SUMMARY OF FINDINGS, CONCLUSIONS, AND

RECOMMENDATIONS

This chapter contains the final outcome of the developed system for Barangay 752 Zone 81 Malate, Manila. It includes the resident interaction, document approval or disapproval of request, announcement through sms, file a complaint and incident report. It also includes the proof of the developed system by providing some screenshots.

Summary of Findings

The developed system provided barangay 752 zone 81 a more efficient way of management and facilitation of their services such as the requesting and the creation of documents, filing complaints, and resident profiling for their barangay. Weaknesses of the previous system of the barangay contains inefficient management and prone to human error which the developed system resolves through online facilitation. The evaluation rating justifies the quality of the system, having a score of 4.76, which is a highly acceptable rating.

Conclusions

The implementation of the developed system of the proponents is the better option for the barangay in terms of providing services to the residents and for smoother facilitation for the barangay administration. The system increases overall productivity and experiences by streamlining and digitizing barangay operations.

Recommendations

Barangay 752 still holds general operations on paper grounds and the proponents heavily suggest the adoption of the barangay management system. The adoption of the system has multiple benefits associated with: the barangay can be managed remotely from different locations, the system is scalable and can be further developed, and the system can have positive impacts to future trends which can be potential large improvements towards their local governance over the barangay.