



## A DYNAMIC WEB-BASED INFORMATION MANAGEMENT SYSTEM FOR BARANGAY OLYMPIA, MAKATI CITY

Jhoanna Elaine Erika Cuizon<sup>1</sup>, Shayyanne Dominiq L. Marasigan<sup>1</sup>, Althea B. Nalcot<sup>1</sup>, Maria Luisa M. Carlos<sup>2</sup>

<sup>1</sup>Software Development Student, College of Engineering and Information Technology

<sup>2</sup>Faculty Member, College of Engineering and Information Technology

\*Corresponding author. Email: [jhoanaelaineerika.cuizon@letran.edu.ph](mailto:jhoanaelaineerika.cuizon@letran.edu.ph)

### ABSTRACT

This capstone project aims to analyze, design, and develop a dynamic web-based information management system for Barangay Olympia in Makati City. The system aims to provide barangay officials and health center staff with an efficient tool for managing administrative tasks and processes, addressing the inefficiencies of the current manual record-keeping system. These inefficiencies include poor organization and limited access, leading to delays and potential errors in handling critical information. Developed using PHP with the Laravel framework and MySQL as the database, the project followed the Agile methodology, incorporating features such as role-based access, authentication, and data encryption to ensure security. System functionality, portability, and security were evaluated using the ISO 25010 standard, with testing conducted through a survey of 50 respondents, including barangay officials, IT professionals, and residents. The system received an average rating of 4.82, interpreted as "Excellent," demonstrating its effectiveness in enhancing productivity and operational efficiency for both barangay and health center activities. This project offers a robust foundation for future improvements, such as integrating additional features or expanding capabilities to better serve the community.

**Keywords:** *Barangay Olympia, Information Management System, Laravel, Agile methodology, record management.*

### INTRODUCTION

Addressing societal concerns is significant for Barangays in attaining good governance. It is their responsibility to be able to lead their constituents and make sure their designated area thrives. One of the many aspects to focus on to achieve this is making important official documents efficiently acquired by the residents, especially when needed. According to the study by Gallera, J. M., & Salvador, A. S. (2023), local-level governance such as the local barangays, could be systematized and beneficial with a digitized information system that enhances the management and access to information.

The Barangay Olympia, District 1 is located at 8674 Fortuna Street, Makati City. Over the past years, Barangay Olympia has been fulfilling its role as the primary government unit, ensuring the residents' welfare and development. It also has a health center catering to the medicinal and health needs of its constituents. With a land area spanning 45.65 hectares, the barangay accommodates a population of 22, 605 individuals. The Barangay Secretariat handles all the administrative work regarding the official records of Barangay Olympia. Her job is to process paperwork, keep records, and other organizational tasks.

As stated by Haddad (2021), the main disadvantage of manual data entry is the high potential for human error due to inaccuracies of data transfer from one system to another. The Barangay Secretary faces an excessive burden in documenting data and retrieving records when constituents are requesting files that they need from the Barangay. Officials are having a hard time looking through each ledger to be able to retrieve and process these records. According to the Secretary, they handle an average of over 100 barangay document requests every day. The health center also accommodates multiple people's records in a day.

Gumabay and Corpuz (2021) conducted a study that discussed the purpose of removing manual processes especially as well in the medical field. This was created to lessen the paperwork, securely record patients' data and medical prescriptions, and provide quick

access to reports and inventory. Because these are manual processes, they must be done accurately and properly. When processing such data then the procedure slows down, and it not only affects the staff but also the constituents. According to the Secretary of the Barangay, Vera Marie Ferrer, and the Barangay Chairman, Bobby Yulo, they use Excel Sheets, however they could not utilize all its features. They also stated that they use Microsoft Word in creating certificates, bringing more heavy work when there are no templates and requiring the staff to print a certificate from scratch. One significant effect is human errors due to the limitations and vulnerabilities associated with manual data entry of the barangay. This method not only consumes a significant amount of time but also requires effort and careful attention to detail.

In addressing the need for efficient records management in Barangay Olympia, the implementation of a Dynamic Web-based Information Management System stands out as a solution.

### Objectives of the Study

This study aimed to design and develop a Dynamic Web-based Barangay Information Management System with an integrated inventory management function for the health center to simplify operations and improve services for Barangay Olympia, Makati City. The system digitized residents and household records automated the issuance of essential documents and provided a platform for residents to make online personal document requests. It included an admin dashboard and announcement board for officials, ensured data privacy through role-based access levels, and offered a dynamic, customizable website for interactive content management. The system's effectiveness was evaluated based on the ISO 25010 standards to ensure quality and usability.

### Significance of the Study

This study benefits Barangay Olympia by introducing a system designed to automate record management and modernize administrative

tasks. Additionally, the system extends its functionality to the Barangay's Health Center, with a simple inventory system to help manage and track their resources. By implementing this system, barangay officials and health center staff can organize official records more efficiently, ensuring that data is secure, easily accessible, and well-maintained. The automation of routine processes not only enhances operational efficiency but also allows officials and health center staff to focus on more strategic and community-centered initiatives.

Furthermore, this system minimizes the likelihood of errors associated with manual record-keeping, encouraging greater accuracy and reliability in administrative operations. It helps barangay and health center officials by reducing workload, minimizing errors, and speeding up processes. Residents benefit from improved services, faster transactions, and more efficient governance. Researchers gain awareness for further study of information systems, while future researchers can use the study as a foundation for related topics. Lastly, Colegio de San Juan de Letran benefits by showcasing academic excellence through the innovative ideas presented in this study.

## Review of Related Literature

### The Importance and Challenges of Information Management Systems

Information Management Systems (IMS) are essential for organizational success in both private and public sectors. As Indeed (2023) explains, IMS supports effective decision-making and growth by collecting, storing, organizing, and distributing data. Modern IMS often utilizes secure cloud storage, ensuring efficient deployment of information to stakeholders, improving operations, and enabling businesses to adapt swiftly. These systems play a vital role in reorganizing processes, fostering productivity, and supporting strategic initiatives.

However, challenges such as handling large data volumes, lack of coordination, and unclear strategic directions hinder IMS effectiveness (Robertson, 2024). Organizations can overcome these obstacles by prioritizing business needs, delivering tangible outcomes, and adopting solutions incrementally. Strong leadership, risk management, and employee training are crucial for successful IMS implementation. As Edology (n.d.) discussed, well-managed IMS empowers businesses to make informed decisions, improve customer service, and respond quickly to market changes, drive growth and long-term success.

### Learning the Role of Barangay Health Center in the Philippines

A barangay health center in the Philippines is a local healthcare facility in the barangay, providing important health services to its community. These centers are run by Barangay Health workers or officials who focus on disease prevention and health promotion. Barangay health workers also play an important role in supporting a specific group of households. Improving the quality of care and making good use of resources, such as using new technologies and systems, is important to ensure these barangay centers continue meeting the healthcare needs of their constituents efficiently (What Is Barangay Health Station/Center, n.d.).

### The Role of Technology in Local Governments

Technology plays an important role in improving local government units' operations by increasing efficiency, transparency, and public engagement. Project Information Management Systems (PIMS) help manage project-related data, automate tasks, and provide real-time updates that enhance decision-making and accountability. BuxByte, Inc. (2023) emphasizes how PIMS improves resource allocation, tracks project progress, and builds public confidence through insightful analytics and transparency. Similarly, Information and Communications Technology (ICT) enhances service quality and

administrative processes by automating tasks like property assessments and collections, as noted by De Castro, and De Castro, (2022).

Digital technology adoption in local government has numerous benefits, including cost savings, better decision-making, and improved delivery service. David et al. (2023) emphasize the importance of developing strategies to maximize these advantages while addressing challenges like a lack of IT professionals, as Hinkley (2020) wrote. Dharmaraj (2020) adds that post-pandemic digitization is critical for boosting local government revenues and adapting to the new economy. Despite slow modernization compared to the private sector, these technologies allow governments to handle larger workloads, reduce paperwork, and enhance services for citizens.

### Synthesis of Related Literature

The Information Management System, also known as IMS, is an important part of any organization, company, or business to improve their services or their overall system for their clients. IMS consists of different systems and processes, including Document Management, Records Management, and Web Content Management, understanding this is crucial for effective management. Information Management Systems have different benefits. IMS enhanced the productivity of the employees. It allows the organization to make better decisions also to improve customer satisfaction. It can significantly enhance organizational efficiency and customer satisfaction. In terms of local government, IMS plays an important role in managing project data, IMS also facilitates better decision-making, increasing transparency, and enhancing public engagement. Adoption of technology by Local government units is essential for improving their services for their constituents. LGUs must adopt several strategic approaches, upgrade their technological infrastructure, and enhance the digital literacy of their employees to fully use the advantages that IMS brings.

## Review of Related Local Studies

### Barangay Local Government Units System with Office Automation Features

According to dela Cerna (2023), the Barangay Automation System highlights the importance of Barangay Local Government Units services in Surigao City, whereas the study is expected to empower digital transformation. Major features include requesting Barangay Documents, filing of complaints, and providing accurate data and reports. The application of the Agile Model simplifies the implementation due to its programming-centric procedures that require minimal conventions. This has promoted time efficiency and maintained the comprehensive use of documentation that was strictly required for the project.

### Barangay Information System for Registration of Inhabitants with Integrated Aggregated Data Profiling

The Barangay Information System (BIS) is an important tool for improving local governance through the registration and profiling of barangay inhabitants. As noted by Manun-og (2023), the Registration of Barangay Inhabitants (RBI) plays a major role in effective planning, providing a basis for initiatives by using accurate demographic data. This system not only ensures peace, order, and security but also digitalizes local records management, reducing face-to-face interactions and facilitating quicker access to services.

As stated by Labanan and Abad (2020), emphasized the significance of e-government systems with integrated aggregated data profiling, as demonstrated in Zone 43. This system organizes records and provides

statistical insights on labor, income, housing, water sanitation, and population demographics. Using a combination of Top-down and Bottom-Up strategies, the system accommodates both the strategic goals of higher authorities and the specific needs of local users. The Agile methodology ensures iterative development with regular feedback from Barangay Officials, improving the system after each module's completion.

#### **Web-Based Inventory Management System for Health Offices**

The Expanded Programme on Immunization (EPI) by the World Health Organization wanted to deliver vaccines to children on a regular schedule as a means to prevent diseases. Determining vaccine demand is important to ensure vaccines are available when needed. In Panabo City, Davao del Norte, the City Health Office has problems in managing vaccine inventory, as the current manual process for recording vaccine stocks and dispensing them is time-consuming and prone to errors. To be able to solve this issue, a web-based inventory management system was developed so that vaccine transactions may improve, helping to make them more efficient (Rebortera, 2020).

#### **Web-Based Barangay System with Document Requesting and Tracking Modules**

In the research conducted by Taruc, et. al. (2023), the system is focused on a web-based system that features documents requesting for the Barangays in Cabanatuan City, Nueva Ecija, Philippines. Whereas it permits users to file complaints and manage, and track documents while following COVID-19 protocols. Major functions are requesting services of the documents, such as Barangay indigency, clearances, and business permits. The study recommendations of the researchers include the maintenance and enhancement of the system in the long run, using a user-centric design approach, and participation with related organizations of IT experts.

#### **E-barangay Records Management System with Service Management, Statistics Reporting, and Census Graphical Analysis**

According to Carpio (2020), the E-Barangay system addresses the challenges of limited resources by leveraging existing Barangay assets to record demographic profiles, handle document requests, and manage incident reports. It also features a reporting module that generates master lists and statistics, aiding in planning and implementing development programs. Carpio recommends translating the system into local languages and fostering interconnectivity among Barangays to boost efficiency and productivity.

According to the study by Villones (2021), it highlights the effectiveness of emerging technologies in reducing errors and data redundancy in Barangay Zone 4-A, Northern Negros. The system's features include data management, summary reporting, and census graphical analysis, which improves data visualization and community planning. Villones suggests maintaining the system with policies aligned to Barangay workflows, ensuring security and scalability, and encouraging its adoption by other Barangays to enhance governance further.

#### **Barangay Management System featuring Centralized Data and Dynamic Announcement Module with Health Center Module**

As stated by Senaris (2023), the Barangay is the principal branch of society, providing basic public services to its constituents. However, many Barangays face challenges in communication and accessing updated information. Thus, the proponents implemented a Barangay Management System as an extension service at the CvSU-Tanza Campus in Cavite, featuring an admin dashboard for report logging, form generation, and incident records management.

In conformity with Lim (2022), the study is motivated by the ongoing pandemic in the Philippines. The system responds to the optimization of public governance and health services at Barangay 16, Bacolod City, Negros Occidental. Key features include document management, incident complaint filing, consultation scheduling, and health service management, along with an inventory of documents and health supplies. The Barangay Healthcare System, as indicated by Go, et. al. (2021), emphasizes the long-term benefits of a Barangay Healthcare System, proposing 'VHISION' to enhance IT and Health Information Systems at Barangka Drive, Mandaluyong City. The features include automating electronic health records (EHRs), recording budgets and medical supplies, and computerizing health inventory and related developmental projects.

#### **Review of Related Foreign Studies**

##### **Major Errors that can affect information security.**

According to the study by Kobis (2023), human errors could be caused by a lot of factors. As written in the research study, one of the factors of these errors is the lack of proper knowledge in information security and protection. Another factor is being affected by the nature of the work, causing employees to be rushed and become fatigued. Having a lot of trust in third-party organizations affects human behaviors as well and it will give huge opportunities for criminal-minded individuals to construct social engineering. Employees will be prone to accidentally spilling sensitive and confidential information outside the organization or company.

##### **Digital Transformation, ICT Adoption, and E-Governance for Quality Public Services**

According to Bousdekis and Kardaras (2020), digital transformation involves collaboration with stakeholders, the creation of new service frameworks, and stronger inter-organizational relationships. However, the adoption of digital technologies in local government remains limited, with significant challenges in transitioning to advanced systems due to low levels of integration and limited research on the subject.

Ziembra (2020) highlights key factors influencing ICT adoption and digital transformation, including ICT investment, information culture, management practices, and quality. Montazemi and Pittaway (2020) emphasize the need for strategic IT planning and knowledge transfer to improve progress, reduce risks, and fully capitalize on the benefits of digitalization.

Yan and Huping (2020) address the difficulty of sustaining citizen engagement in e-government systems, proposing innovative principles to ensure continuous use. Local governments can leverage evolving technologies to "smartify" public services, creating real-time management systems, blockchain-secured records, and automated dispute resolution systems, as noted by Engin and Treleven (2019). These technologies, including big data, AI, and IoT, have the potential to transform government operations, improve efficiency, and enhance the quality of services delivered to communities.

##### **Digitization of Management processes to address challenges and opportunities.**

According to the study of Agostini, Galati, & Gastaldi (2020), input processing is becoming more complicated and interconnected, and most of the innovation processes are made in inter-organizational platforms. The innovation process has shrunk into expecting and improving stages where customers' feedback is assembled immediately. In digitization of processes, systems are more compressed and fast-paced. Aiming for more convenience for the

constituents as well as effectiveness and efficiency.

### The development of service quality, accountability, and transparency of local government.

Local Governments in Surabaya, Indonesia are transitioning into e-government services. There is a lack of research studies about IT development in governance and public service. The study conducted by Sofyani, Riyadh, & Fahlevi (2020), discussed the government employees' perspective on the adoption of ICT for the service quality of public services. IT development is a tool and a strategy to enhance the performance and accountability of public servants as well as the government's projects.

### Synthesis of Related Studies

Governments are an essential component to improve the quality of life for people, and so it is essential to adopt an effective digital transformation that will help contribute to the improvement of quality service. Local governments must find ways to innovate and keep up with the ever-changing technology. It is then they will be able to "smartify" or improve the public services' impact. Ideally, to attain this growth they must acknowledge the potential issues and errors that they had, are, and will be encountered in adopting new digital technologies. Hence, it is proper to know not just about information management but also about security, protection, and many more. Good practice is a must in these kinds of systems and policies.

### Conceptual Framework

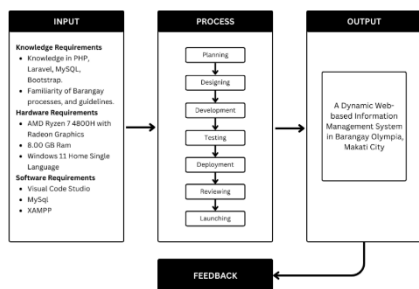


Figure 1. IPO Model

To successfully develop the Barangay Information Management System, the proponents require a strong foundation in key areas such as MySQL, Bootstrap, Laravel, and PHP. Additionally, an understanding of barangay policies and procedures is crucial to align the system with the community's needs. The project's hardware requirements include an AMD Ryzen 7 4800H processor with Radeon Graphics and 8GB of RAM to ensure optimal performance during development, along with Windows 11 for compatibility. On the software side, essential tools include MySQL for database management, XAMPP for local server setup, and Visual Studio Code as a useful text editor for coding tasks.

The development process follows the Agile Method, starting with thorough planning to define the study's background, objectives, and scope. System analysis identifies the system's requirements, constraints, and solutions, while the design phase creates a detailed blueprint of the system's architecture. The development phase translates these designs into code, followed by rigorous testing to meet quality standards. After iterative improvements, the system is web-hosted, making it accessible to end-users online. Continuous comments and reviews ensure transparency and interaction through feedback. Finally, the system is launched, concluding the completion of the project and delivering a dynamic, web-based information management system for Barangay Olympia, Makati City.

## METHODOLOGY

### Project Design

In building the Barangay Information Management system for Barangay Olympia, the proponents embraced the Agile methodology for project design. This decision was made due to its inherent flexibility and iterative nature, particularly suitable for the environment of barangay management.

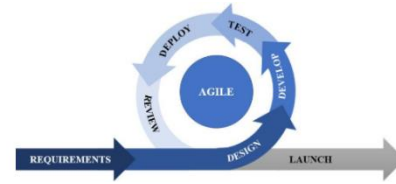


Figure 2. Agile Methodology

The initial phase of the project revolved around gathering requirements by conducting interviews with the Barangay Secretary and Health Center Admins. The proponents meticulously assessed the limitations of the existing system, such as inefficient record-keeping and lack of centralized information, while diligently compiling all necessary information provided by the Barangay. Furthermore, the proponents outlined the scope of the system, which includes features like resident profiles, document management, and communication tools, and established a development timeline to ensure timely delivery.

Progressing to the Design phase, the proponents meticulously planned the system's flow and crafted screen designs accordingly. Special emphasis was placed on creating a user-friendly interface to ensure a seamless experience for barangay staff and residents alike. This phase also involves designing the database structure to efficiently store and retrieve information related to residents, events, and administrative tasks. The most extensive phase, Development, saw the proponents translating their plans into functional code. Alongside this, the proponents integrated various security measures to fortify the system against potential threats, ensuring data privacy and integrity. Functions like user authentication, access control, and data encryption were implemented to safeguard sensitive information.

Subsequently, the Testing phase was initiated to meticulously examine the system for any bugs or errors, ensuring its reliability and efficacy. This phase involved careful testing procedures, including unit testing, integration testing, and user acceptance testing, to identify and resolve any issues before deployment. The Deployment phase involved preparing the system for launch to its intended users. Compatibility across different platforms, including desktop and mobile devices, was meticulously ensured to reach a wide audience. The system was deployed on secure servers with regular backups to ensure data availability and resilience against potential downtime.

The subsequent Review phase entailed a thorough evaluation of the system, pinpointing areas ripe for improvement based on user feedback and performance metrics. This feedback was instrumental in refining the system further, addressing usability issues, and optimizing performance. Ultimately, the Launching phase marked the official release of the system to users. The proponents provided comprehensive user training, including video tutorials and user manuals, to ensure users can effectively utilize the system's features. Additionally, they promptly addressed any lingering issues, such as user interface glitches or performance problems, ensuring a seamless transition and maximizing user satisfaction.

**Project Development**

The proponents' capstone project adhered to seven phases of the Agile Methodology, spanning a total of 34 weeks. The Planning phase (4 weeks) involved defining project goals, determining its scope, and identifying the resources required, laying the foundation for the project. The Design phase (4 weeks) focused on creating the system's blueprint, emphasizing user interface design, feature wireframing, and database architecture. The Development phase, the longest at 18 weeks, transformed these designs into functional code through extensive programming and component integration, serving as the project's backbone. Tools such as PHP, Laravel, CSS, Bootstrap, JavaScript, MySQL, wireframing tools, and Visual Studio Code were utilized to build and refine the system.

Following development, the Testing phase (4 weeks) ensured the system met quality standards by addressing bugs and resolving performance issues. The Deployment phase (2 weeks) involved preparing the system for launch by configuring settings, verifying compatibility, and conducting final checks. The Review phase (4 weeks) evaluated the project lifecycle, identified areas for improvement, and incorporated feedback from stakeholders for refinement. Finally, the Launch phase (1 week) introduced the completed system to its intended audience, provided user training, and resolved any last-minute concerns. Each phase was essential in delivering a robust and reliable capstone project.

**Testing Procedure**

The system underwent several tests. Unit Testing focused on verifying the correct operation of individual system components, such as data management, search functions, data entry forms, and report and document generation. System Testing evaluated how these components worked together, assessing workflows, registrations, logins, records management, and overall procedures.

User Acceptance Testing was carried out with actual users to ensure their satisfaction and validate the system's usability and functionality. Feedback from users helped identify any issues or areas needing improvement.

Additionally, Security Testing was performed to protect sensitive information, identify system vulnerabilities, and ensure data protection. The proponents implemented necessary security measures like authentication, role-based access controls, and audit logs to protect records and documents. Lastly, Usability Testing was conducted to evaluate the user-friendliness of the system for both residents and administrative personnel. This test focused on ensuring easy navigation, a friendly user interface, and a positive overall user experience.

**Evaluation Procedure**

This research was conducted in Barangay Olympia, Makati City situated at Fortuna Street, owing to the presence of the barangay hall in the area. The proximity of the barangay hall to the residences of its constituents ensures convenient access for data collection and interaction with community members.

**Table 1 Likert Scale for System Evaluation**

Numerical Scale	Descriptive Rating
5.0	Excellent / Highly Acceptable
4.0	Very Good / Very Acceptable
3.0	Good / Acceptable
2.0	Fair / Fairly Acceptable
1.0	Poor / Not Acceptable

In the evaluation procedure, it involved survey feedback from barangay officials, IT professionals, and residents. Respondents were selected based on their involvement with the system. A total of 50 responses were collected, comprising 30 residents, 4 barangay officials, and 16 IT professionals. The evaluation was done using a Likert scale to measure satisfaction, focusing on system performance, security, usability, and compatibility, based on the ISO/IEC 25010 criteria.

**Table 2 Descriptive Evaluation of Mean**

Rating	Mean Range	Verbal Interpretation
5	4.21 – 5.00	Excellent
4	3.31 – 4.20	Very Good
3	2.61 – 3.30	Satisfactory
2	1.81 – 2.60	Fair
1	1.00 – 1.81	Poor

The table presents a descriptive evaluation of average weighted scores, categorizing them into specific ranges and corresponding verbal interpretations. By calculating the weighted average rating for each dataset, the researchers gleaned valuable insights into the overall performance of the proposed system, thereby facilitating informed decision-making based on the summarized data.

**Statistical Tools**

Statistical tools used are average and weighted mean. They both involve analyzing and interpreting collected information to draw meaningful conclusions. Through statistical methods, patterns and trends within the data are identified to address the objectives effectively.

The average formula was utilized by researchers as it is crucial in evaluations and surveys as it provides a concise representation of the overall data. It helped to summarize the responses or scores collected, offering insights into the general perception or performance. This simplifies the interpretation process and aids in making informed decisions based on the collective data. In evaluations and surveys, the average formula is instrumental in deriving the mean ratings. This formula provided a descriptive evaluation of average scores, categorizing them into specific ranges and corresponding verbal interpretations. By calculating the average rating for each dataset, the researchers gained valuable insights into the overall performance of the proposed system, facilitating informed decision-making based on the summarized data.

Meanwhile, the weighted mean was used to provide a more detailed comprehension, considering the importance of different responses. By assigning weights to different data points based on their significance, the weighted mean ensures a more accurate representation of the dataset. Additionally, percentage analysis was used to measure the level of agreement among participants on aspects of the system, allowing for a clearer understanding to allow users to be satisfied with specific features. These statistical tools played an important role in assessing the system's effectiveness, helping the researchers make informed decisions about its performance, usability, and areas for improvement.

**Project Structure**

The study is confined to Barangay Olympia only. It focused on the Document and Records Management System of Barangay Olympia, Makati City. The proponents utilized PHP programming language along with HTML, CSS, and Bootstrap for the Graphical User Interface, and stored information using the MySQL Database. The Laravel Framework was also utilized. The duration of this study is the Second Semester of the Academic Year 2023 - 2024 and the First

Semester of the Academic Year 2024 - 2025.

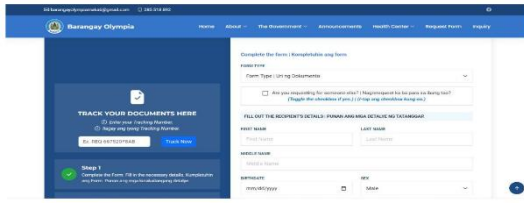


Figure 3. Request Form

This page allows users to request their documents. Additionally, users can track the status of their requests on the left side of the page. The user will choose the form type in the dropdown provided. Residents can access a homepage with an event calendar, announcements, barangay information, a gallery, weather updates, testimonials, and a health center page with schedules and tips. They can submit feedback, request documents, track requests using a tracking number, view barangay officials and department contacts, access transparency documents, read FAQs, and send messages via a real-time messaging module integrated with Messenger. Requests include certificates, clearances, IDs, and CCTV viewing.

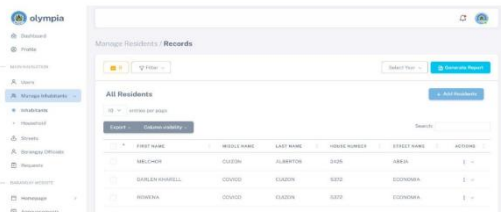


Figure 4. Manage Residents

This page displays all residents of the barangay and includes a button to create a new resident record. Additionally, there is a button to generate important reports regarding the residents. On the left side, users can filter the records for easier navigation. The actions column contains the buttons that will redirect the users to other pages, like the edit form page.

The system allows barangay admin to manage records, issue documents, and oversee operations efficiently. Staff may only access read-only functions. Features include a login module with validation and password recovery, a dashboard for analytics, to-do lists, an event calendar, announcement management, and an information module for barangay details. Admins can manage residents' and household records, generate summary reports, and issue documents in PDF format, including IDs, clearances, and job-seeker forms. Additional functionalities include feedback forms, user management, a transparency board, website management with backup and restore FAQ management and an organizational chart. Admins can also edit step-by-step processes for requesting documents.

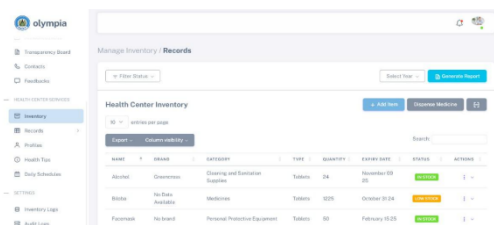


Figure 5. Manage Health Center Inventory

This page displays all inventory items of the health center, featuring a button to generate a summary report and a dropdown menu to filter the records for easier viewing. It also includes buttons for managing the inventory items. The actions column contains the buttons that will redirect the users to other pages, like the edit form page.

Health center admin can log in using a validated login module with password recovery and manage schedules for health services, health tips, and inventory. The inventory system includes a function to enable the system's camera for a barcode scanner to efficiently manage and track stocks, along with the ability to generate summary reports. Schedules and health tips are displayed on the residents' homepage, offering timely updates. Staff may only access read-only functions.

The limitations of the system include the lack of a financial module, which could improve the barangay's financial management, such as tracking expenses and budgeting. Additionally, the document request process is complex, requiring multiple forms to be filled out, which may confuse residents and lead to delays. Furthermore, the system's focus is on personal-use document issuance, excluding other types of requests, and it does not allow residents to cancel completed requests. These limitations restrict the system's overall functionality and may hinder user experience.

## RESULTS AND DISCUSSIONS

The following table presents the overall rating of the system, summarizing the evaluation based on various criteria. It provides a total assessment that reflects the system's overall performance and user satisfaction, providing important insights into its effectiveness and areas of strength.

Table 3 Overall Rating

Criteria	Mean	Interpretation
Functional sustainability	4.88	Excellent
Reliability	4.81	Excellent
Portability	4.73	Excellent
Usability	4.79	Excellent
Performance efficiency	4.82	Excellent
Security	4.84	Excellent
Compatibility	4.88	Excellent
Maintainability	4.81	Excellent
<b>OVERALL</b>	<b>4.82</b>	<b>Excellent</b>

The system's overall rating is "Excellent," with an overall mean score of 4.82. Each criterion reflects strong performance, notably Functional Sustainability, and Compatibility, achieving a mean score of 4.88. Other criteria, including Reliability (4.81), Security (4.84), and Performance Efficiency (4.82), also received high ratings, demonstrating the system's excellent capabilities in various aspects. Portability and Usability maintain strong scores of 4.73 and 4.79, respectively, highlighting the system's adaptability and user-friendly design.

The dynamic web-based system for Barangay Olympia improves information management with advanced features and automation. It enhances administrator productivity and offers a user-friendly interface for residents. Tested by 50 participants, including officials and residents, the system earned a high score of 4.82, reflecting excellent reliability, usability, and performance. These results confirm the system's success in meeting objectives and improving barangay operations while strengthening resident engagement.

Thus, the proponents developed a Dynamic Web-based Information Management System for Barangay Olympia, achieving the goal of

improving barangay information management. The system streamlines document requests, resident records, health center inventories, and administrative controls. With a user-friendly interface, role-based security, and technologies like PHP, Laravel, and Bootstrap, it meets all project requirements. Usability tests based on ISO 25010 confirmed its effectiveness in enhancing accessibility and functionality for residents and administrators.

The study's major findings emphasize the system's success in improving barangay operations while maintaining data security and a smooth user experience. Although the system does not include a financial module, it effectively addresses the primary needs of the barangay administration. The study also suggests areas for further development, such as adding financial management, expanding document request options, and integrating health center record management. This paper has achieved its goal of providing an efficient system for barangay management and promises continued enhancements to broaden its functionality and further improve the user experience.

## CONCLUSION

In summary, the proponents successfully developed a dynamic web-based information management system for Barangay Olympia, which improved record management efficiency by automating processes and increasing accessibility. All requirements set at the project's initial planning were met, ensuring the best functionality for both barangay admins and residents. The system includes features for requesting documents, managing resident and household information, tracking and handling health center inventory, and implementing administrative controls. With a user-friendly interface, it provides smooth experiences for both administrators and residents.

The development utilized PHP, Laravel, CSS, Bootstrap, and JavaScript, following the agile methodology to allow iterative improvements. Although the system does not include a financial module, it passed usability tests based on the ISO 25010 standard, ensuring ease of use and accessibility.

This study contributes to the field of information management systems by providing an efficient, realistic solution for local government units. The research has suggestions for both academic study in the development of similar systems and practical application in improving barangay administrative processes. The system's successful implementation demonstrates its promise for improving local governance, with possibilities for future growth. The paper achieved the creation of a fully functional and tested system that meets the needs of Barangay Olympia, Makati City.

## RECOMMENDATION

To improve the system further, adding a financial module would enhance barangay finance management. Expanding document requests to include permits for activities, such as building permits, would increase its functionality. Integrating features for managing the Barangay Blotter and business registrations would enhance the system. Additionally, incorporating a patient records management system and appointment scheduling features for the health center would simplify healthcare services. This would improve access and patient satisfaction by reducing wait times and ensuring timely care. These improvements would make the system more comprehensive and efficient for all users.

## REFERENCES

- Agostini, L., Galati, F., & Gastald, L. (2020). The digitalization of the innovation process: Challenges and opportunities from a management perspective. *European Journal of Innovation Management*, 23(1), 98–114. <https://doi.org/10.1108/ejim-11-2019-0330>
- Bousdekis, A., & Kardaras, D. (2020). Digital transformation of local government: A case study from Greece. *2020 IEEE 22nd Conference on Business Informatics (CBI)*, 131–140. <https://ieeexplore.ieee.org/abstract/document/9140265>
- Buxbyte Inc. (2023, July 3). *Revolutionizing local government: The power of project information management systems (PIMS)*. LinkedIn. <https://www.linkedin.com/pulse/revolutionizing-local-government-power-project-information-management/>
- Carpio, C. O. (2020). Barangay management system. *International Journal of Multidisciplinary Research and Publications*, 3(1), 78. <https://ijmr.com/wp-content/uploads/2020/07/IJMRAP-V3N1P78Y20.pdf>
- David, A., Yigitcanlar, T., Li, R. Y. M., Corchado, J. M., Cheong, P. H., Mossberger, K., & Mehmood, R. (2023). Understanding local government digital technology adoption strategies: A PRISMA review. *Sustainability*, 15(12), 9645. <https://www.mdpi.com/2071-1050/15/12/9645>
- De Castro, C. A., & De Castro, E. G. (2022). E-government initiatives of local governments in the Philippines. *Journal of Community Development Research (Humanities and Social Sciences)*, 15(3), 55–70. <https://www.journal.nu.ac.th/JCDR/article/view/Vol-15-No-3-2022-55-70>
- Dela Cerna, M. A. (2023). Development and implementation of an office automation system for barangay local government units. *2023 4th International Conference for Emerging Technology (INCET)*, 1–9. [https://www.researchgate.net/publication/372259322\\_Development\\_and\\_Implementation\\_of\\_an\\_Office\\_Automation\\_System\\_for\\_Barangay\\_Local\\_Government\\_Units](https://www.researchgate.net/publication/372259322_Development_and_Implementation_of_an_Office_Automation_System_for_Barangay_Local_Government_Units)
- Edology. (n.d.). *How important is information management?* <https://www.edology.com/blog/computing-it/how-important-is-information-management/>
- Engin, Z., & Treleaven, P. (2019). Algorithmic government: Automating public services and supporting civil servants in using data science technologies. *Computer*, 52(3), 14–23. <https://ieeexplore.ieee.org/abstract/document/8852885>
- Gallera, J., & Salvador, A. (2023). Assessment of digital information systems for local barangays. *International Research Journal of Advanced Engineering and Science*, 8(2), 171. <http://irjaes.com/wp-content/uploads/2023/04/IRJAES-V8N2P171Y23.pdf>
- Go, V. M. M., Taniog, J. S., Ventura, A. M. C., & Vergara, R. C. A. (2021). *Vhision: Intelligent healthcare system for Barangay Barangka Drive in Mandaluyong City*. ResearchGate. [https://www.researchgate.net/profile/Albert\\_Miguel\\_Ventura/publication/358740428\\_VHISION\\_INTELLIGENT\\_HEALTHCARE\\_SYSTEM\\_FOR\\_BARANGAY\\_BARANGKA\\_DRIVE\\_IN\\_MANDALUYONG\\_CITY/links/6212f0a4eb735c508ae63980/VHISION-INTELLIGENT-HEALTHCARE-SYSTEM-FOR-BARANGAY-BARANGKA-DRIVE-IN-MANDALUYONG-CITY.pdf](https://www.researchgate.net/profile/Albert_Miguel_Ventura/publication/358740428_VHISION_INTELLIGENT_HEALTHCARE_SYSTEM_FOR_BARANGAY_BARANGKA_DRIVE_IN_MANDALUYONG_CITY/links/6212f0a4eb735c508ae63980/VHISION-INTELLIGENT-HEALTHCARE-SYSTEM-FOR-BARANGAY-BARANGKA-DRIVE-IN-MANDALUYONG-CITY.pdf)
- Haddad, D. (2021, February 5). *Why manual data entry is bad for business*. Acodis. <https://www.acodis.io/blog/why-manual-data-entry-is-bad-for-business>

- Hinkley, S. (2023, September 19). *Technology in the public sector and the future of government work*. UC Berkeley Labor Center. <https://laborcenter.berkeley.edu/technology-in-the-public-sector-and-the-future-of-government-work/>
- ICLEI. (2023, November). *Digitalization: A game changer for local governments & communities*. <https://iclei.org/wp-content/uploads/2023/12/2022-Academy-Digitalization-Policy-Brief-ICLEI.pdf>
- Indeed. (2023, January 13). *What is an information management system? (With features)*. <https://ca.indeed.com/career-advice/career-development/information-management-system>
- Kobis, P. (2023). Classification of key human factors in the area of information resources security management in small enterprises in Poland. *Procedia Computer Science*, 225, 1641–1650. <https://doi.org/10.1016/j.procs.2023.10.153>
- Labanan, R. M., Abad, L. P., & M. B. (2020). Development of an information-based dashboard: Automation of barangay information profiling system (BIPS) for decision support towards e-governance. In *Proceedings of the 2020 4th International Conference on E-Society, E-Education and E-Technology* (pp. 68–75). <https://dl.acm.org/doi/abs/10.1145/3421682.3421691>
- Lim, J. P. (2022). *Barangay integrated management system with mobile support*. Academia. [https://www.academia.edu/84426305/Barangay\\_Integrated\\_Management\\_System\\_with\\_Mobile\\_Support](https://www.academia.edu/84426305/Barangay_Integrated_Management_System_with_Mobile_Support)
- Manun-og, M. (2023). Development of registry of inhabitants record management system: A support tool for local governance. *Journal of Engineering and Technology*. <https://jet.utem.edu.my/jet/article/view/6418/4265>
- Pittaway, J. J., & Montazemi, A. R. (2020). Know-how to lead digital transformation: The case of local governments. *Government Information Quarterly*, 37(4). <https://www.sciencedirect.com/science/article/abs/pii/S0740624X1830457X>
- Rebortera, M. A. (2020). *E-vaccims: A web-based vaccine inventory management in the health office entrenching forecasting algorithm*.
- Robertson, J. (2024, February 15). *10 principles of effective information management*. Step Two. [https://www.steptwo.com.au/papers/kmc\\_effectiveim/](https://www.steptwo.com.au/papers/kmc_effectiveim/)
- Senaris, J. E. S. (2023). Implementation of barangay management system: An extension service of CvSU-Tanza Campus. *International Journal of Research in Education Humanities and Commerce*, 4, 75. [https://ijrehc.com/uploads2023/ijrehc04\\_75.pdf](https://ijrehc.com/uploads2023/ijrehc04_75.pdf)
- Sofyani, H., Riyadh, H. A., & Fahlevi, H. (2020). Improving service quality, accountability and transparency of local government: The intervening role of information technology governance. *Cogent Business and Management*, 7(1). <https://doi.org/10.1080/23311975.2020.1735690>
- Tan, A. (2020). *eCommerce industry: How it can sustain the Philippine economy*. Syntactics, Inc. <https://www.syntacticsinc.com/news-articles-cat/e-commerce-industry-economy/>
- Taruc, F. S., Martin, T. A. S., Olipas, C. N. P., & Alegado, R. T. (2023). *Docu-Go: The development and assessment of a web-based barangay document requesting system*. (PDF) [Docu-Go: The Development and Assessment of a Web- Based Barangay Document Requesting System](#)
- Tsvuura, G. (2022). Knowledge and skills for managing digital records at selected state universities in Zimbabwe. *Journal of the South African Society of Archivists*, 55, 110–123. <https://www.ajol.info/index.php/jsasa/article/view/235749>
- Villones, T. T. (2021). *Barangay constituents information and services management system*. IJCSMC. [https://www.academia.edu/46962511/BARANGAY\\_CONSTITUENTS\\_INFORMATION\\_and\\_SERVICES\\_MANAGEMENT\\_SYSTEM](https://www.academia.edu/46962511/BARANGAY_CONSTITUENTS_INFORMATION_and_SERVICES_MANAGEMENT_SYSTEM)
- Zanzalari, D. (2022, September 13). *Advantages of e-commerce*. The Balance. <https://www.thebalancemoney.com/advantages-of-e-commerce-1141610>
- Ziamba, E. (2020). Exploring levels of ICT adoption and sustainability: The case of local governments from Poland. *Procedia Computer Science*, 176, 3067–3082. <https://doi.org/10.1016/j.procs.2020.09.181>