

Digitalizing Governance: A Transformation on the Processes of One Community in the Philippines

Joseph T. Aliling¹, Ben B. Santa Ana², Kristine T. Soberano, PhD³

^{1,2}MIT Graduate School Department, State University of Northern Negros, Philippines

³State University of Northern Negros, Philippines

ABSTRACT: The study entitled “Digitalizing Governance: A Transformation on the Processes of One Community in the Philippines” explores the transition of Barangay Trinidad’s administrative functions from traditional manual methods to a streamlined digital system. This transformation is anchored on the development and implementation of the Electronic Barangay Information Management System (E-BIMS), a customized digital solution designed to improve the efficiency, accuracy, and accessibility of barangay services and records management.

The research employed the Systems Development Life Cycle (SDLC) methodology, encompassing the stages of planning, analysis, design, implementation, and maintenance. Data were collected through interviews, surveys, and observations of barangay personnel to identify current issues in manual operations such as slow data retrieval, record mismanagement, and time-consuming transactions. Based on the gathered information, E-BIMS was developed to address these challenges by automating key processes such as resident profiling, certificate issuance (e.g., Barangay Clearance, Certificate of Indigency), and report generation.

The results of the deployment system showed notable improvements in the barangay’s daily operations. Transactions became faster, records were more organized and easier to retrieve, and overall delivery service to the public improved significantly. Feedback from barangay officials and staff highlighted increased productivity, reduced paperwork, and enhanced transparency. This shift to digital governance not only modernized the administrative structure of Barangay Trinidad but also set a precedent for other local government units aiming to embrace technological advancement.

The study concludes that digitalizing barangay processes through systems like E-BIMS contributes greatly to the efficiency and integrity of local governance. It recommends continued system updates and capacity-building initiatives for barangay personnel to ensure the long-term success and adaptability of the digital transformation.

KEYWORDS: Barangay Information System, Digital Governance, E-Governance, ICT, Local Government

I. INTRODUCTION

In today’s digital era, where nearly every aspect of life is touched by technology, managing information efficiently has become a critical part of good governance. Citizens now expect faster, more reliable services from their local government units (LGUs), and rightfully so. Yet, many barangays in the Philippines still rely heavily on traditional manual systems. These outdated processes often involving handwritten records, physical filing cabinets, and time-consuming document retrieval are not only inefficient but also vulnerable to errors, misplacement of files, and data loss. For frontline government offices like the barangay, which serve as the first point of contact for many residents, such inefficiencies can significantly affect the quality of public service.

Barangay Trinidad, a small and tightly knit community, is no exception. Like many others, it faces daily challenges in keeping track of residents’ information, issuing barangay documents, and preparing reports for various stakeholders. From long queues at the barangay hall to delays in obtaining certifications, both residents and barangay staff experience the frustration brought about by these slow processes. Staff members often juggle multiple roles with limited resources, and the lack of a structured digital system only makes their jobs harder. It is in this context that the need for a practical and sustainable digital solution has become increasingly clear.

This study aims to address these challenges by designing and implementing the Electronic Barangay Information Management System (E-BIMS) a digital platform tailored specifically for barangay-level governance. The goal is simple: to make the day-to-day

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tasks of barangay officials easier and more efficient while improving the overall experience for residents. E-BIMS is intended to automate core processes such as resident profiling, issuance of certificates (like Barangay Clearance and Certificates of Indigency), and generation of reports. With just a few clicks, officials can retrieve accurate data, process documents quickly, and maintain an organized digital archive of barangay transactions. This transformation is expected to reduce paperwork, shorten waiting times, and minimize errors—all while ensuring that critical data is backed up and accessible.

The significance of this study goes beyond just convenience it is about empowering local leaders and improving lives at the grassroots level. When a mother no longer has to wait half a day just to get a barangay clearance, or when a student can easily request documents needed for a scholarship, the impact of digital transformation becomes real and tangible. Moreover, organized digital records help barangay officials make better decisions, especially during emergencies, elections, or planning sessions. They can identify vulnerable sectors, track trends in resident needs, and respond more effectively. In essence, a system like E-BIMS does not just save time; it builds a more responsive, transparent, and accountable local government.

Digital transformation in governance is not a novel concept it's a global trend. Countries around the world have embraced e-governance to improve public service delivery. Sharma and Gupta (2020) noted that digital platforms lead to higher citizen satisfaction and operational efficiency in public offices. Meanwhile, local studies such as those by Cruz and Villanueva (2021) have shown that implementing information systems in rural communities greatly enhances the way LGUs manage data and serve constituents. These findings reinforce the idea that even small-scale digital projects, when aligned with the community's needs, can have a meaningful impact.

Ultimately, this study contributes to the ongoing conversation about how technology can uplift even the smallest government units. By documenting the process and outcomes of implementing E-BIMS in Barangay Trinidad, it offers a valuable example for other barangays and municipalities across the country. It demonstrates that digital innovation doesn't have to be expensive or complicated to be effective it just needs to be thoughtful, relevant, and responsive to the people it aims to serve. In a country where the barangay is the heart of local governance, modernizing these systems is not just a technological upgrade it's a step toward building a more inclusive and capable future for every Filipino community.

II. OBJECTIVES OF THE STUDY

This study was conducted with the goal of developing an Electronic Barangay Information Management System (E-BIMS) tailored specifically for Barangay Trinidad, a growing community in Guihulngan City, Negros Oriental. The main purpose of this initiative is the intention to address the recurring issues faced by barangay personnel and residents in managing information, processing transactions, and maintaining essential records. As with many other barangays across the country, Barangay Trinidad has long relied on manual, paper-based processes which, while familiar, are increasingly impractical in today's fast-paced, digital environment.

The primary objective of the system is to make the barangay's day-to-day operations more efficient, accurate, and organized. Every day, barangay officials receive numerous requests from residents' requests for clearances, certificates, residency verifications, and more. These are often managed manually, leading to delays, misplaced documents, duplicated efforts, and even data inconsistencies. Through the digitization of resident records and the automation of barangay document generation, EBIMS significantly cuts down the time and physical effort involved in handling these requests. For example, instead of searching through stacks of papers or logbooks, officials can now quickly search for a resident's profile, generate the required document, and release it all in a few minutes. This not only boosts productivity but also enhances the overall service experience for community members.

Beyond just streamlining requests, the system is built to support barangay staff in performing their daily duties more effectively. Many barangay personnel multitask, especially in smaller barangays where manpower is limited. By using a digital system, staff members can better manage their time, reduce repetitive workloads, and focus more on community engagement and governance. Important files can be stored securely and accessed easily, reducing the risk of losing critical documents due to fire, flood, or simple misplacement a common concern in areas with limited physical storage.

Specifically, E-BIMS is designed to assist key officials such as the Barangay Captain and Barangay Secretary in overseeing the wide range of responsibilities under their jurisdiction. These include:

- Managing and updating resident profiles for accurate demographic records
- Issuing certifications such as Barangay Clearance, Certificate of Indigency, or Certificate of Residency
- Recording blotter incidents, helping ensure timely documentation of complaints or disputes
- Monitoring barangay revenues and budgeting for better financial transparency
- Storing official documents and files in a centralized, organized, and secure system
- Sharing barangay news and updates with the community for better public awareness
- Tracking barangay officials and staff assignments, which helps with accountability and task delegation

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The system also incorporates role-based access, allowing other authorized personnel such as kagawads, treasurers, and committee heads—to participate in managing records and performing administrative tasks. This shared responsibility fosters a more collaborative and efficient work environment, ensuring that no single person is overwhelmed and that operations can continue even when key staff are unavailable.

At its core, this study aims to create a user-friendly, accessible, and community-centered platform. E-BIMS is not just a technical upgrade it represents a shift in how public service is delivered at the grassroots level. When barangay officials are equipped with the right tools, they can make better, data-informed decisions for the welfare of their constituents. Residents, on the other hand, benefit from quicker service, more accurate documentation, and a stronger sense of trust in their local leaders.

In the long term, systems like E-BIMS help strengthen local governance, build resilient communities, and promote greater transparency and accountability. By demonstrating that even a small barangay can successfully transition into digital governance, this project sets an example for other LGUs aiming to modernize their operations and improve service delivery in the most practical and meaningful ways.

III. MATERIALS AND METHODS Research Method Used

To build the E-Barangay Information Management System (E-BIMS), the researchers followed the Prototype Model of system development. This method was chosen because it allowed them to create an initial version of the system, test it with actual users, and continuously improve it based on the feedback received. Each stage—design, development, and evaluation— was done iteratively to make sure the final system would really suit the needs of the barangay.

Sampling Technique

The study was conducted in Barangay Trinidad, Guihulngan City, Negros Oriental, which consists of 1,729 households and a total population of 7,352 based on 2021 records. Instead of surveying the entire population, the researchers used purposive sampling to focus on key individuals like the Barangay Captain, Secretary, and Staff—the main users of the system. These individuals were chosen because of their direct involvement in the barangay's day-to-day operations and their essential role in handling resident records.

Instrument Generation and Validation

The main tool used in this study was the E-BIMS software, which the researchers developed themselves. Since the system wasn't based on a standardized template, they made sure it was effective through a series of validation steps. First, it underwent Alpha Testing, where the team internally checked for bugs and refined the system. Then it went through Beta Testing, where selected barangay staff used the system and gave feedback. The team also conducted unit, integration, and acceptance tests to make sure each function worked smoothly and reliably.

Data Collection Procedure

The development team gathered data through personal visits, interviews with barangay officials, and review of existing barangay forms and processes. This helped them understand the current manual system and see where improvements could be made. During development, sample data were used to build the system. Once the features were stable, actual resident data were entered for testing and live use.

Data Analysis

The system was analysed both qualitatively and quantitatively. The team looked at how easy it was to use, how fast it could process requests, and how accurately it could retrieve and store information. They also prepared a Gantt chart to manage the timeline and a Risk Management Plan to prepare for potential technical issues like power outages or server errors.

Ethical Considerations

The researchers made sure to handle all data with care. They explained the purpose of the project to all participants and asked for their verbal consent before involving them in testing. Only authorized barangay staff were given access to the system, and all personal information was treated with strict confidentiality. The system was also password-protected to always ensure security.

Steps and Processes in Developing the E-BIMS

The development of the Electronic Barangay Information Management System (E-BIMS) involved several structured and iterative phases aligned with the Prototype Model. Initially, the researchers conducted data gathering through interviews and observations with barangay officials to identify key issues with the manual system. This was followed by the design phase, where wireframes and flowcharts were created to visualize the system's interface and data flow. A working prototype was then

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developed using Laravel and MySQL. Afterward, the system was presented to barangay personnel for feedback, which was used to refine its features. The development team continually enhanced the system based on user input until a final, fully functional version was ready for deployment in Barangay Trinidad.

IV. RESULTS AND DISCUSSION

The E-Barangay Information Management System (E-BIMS) enables barangay staff to efficiently manage and retrieve resident, business, and blotter records through organized and easy-to-navigate menus such as Dashboard, Residents, Clearances, Blotters, and Reports. In terms of functional usability, the system is highly accessible as it operates through a web browser, making it easy to use even for individuals with limited computer skills. The layout is simple and intuitive, allowing users to locate features without difficulty. Its responsiveness ensures smooth transitions between pages and quick loading of data.

In terms of performance efficiency, the system is built on a local server and utilizes a MySQL database, which supports the management of large volumes of data. It ensures real-time encoding, updating, and retrieval of information, which helps barangay officials provide faster services to residents. The backend processes have been optimized to support multiple transactions without compromising speed and accuracy, even during peak usage times.

Security is also a critical aspect of the system. E-BIMS includes a secure login page that restricts access only to authorized users, each assigned specific roles such as administrator or barangay staff. The system also includes validation checks to ensure that only correct and appropriate data is encoded, minimizing the risk of errors or malicious input. Furthermore, its role-based access control ensures that users can only access the features and data that are relevant to their responsibilities, thus protecting sensitive information.

Another strength of the system lies in its use of open-source technologies, including PHP, MySQL, and the Laravel framework. These tools not only reduce development and maintenance costs but also allow the system to be easily upgraded or customized in the future. Additionally, E-BIMS is designed to function offline, which is particularly beneficial for barangays in remote areas where internet connectivity is unreliable. This ensures that essential services and data access remain uninterrupted, supporting efficient barangay operations under various conditions.



Figure 1.0 System Dashboard

Figure 1 shows the main page of the E-Barangay Information Management System (E-BIMS), which serves as the dashboard for administrators. It provides a quick overview of essential barangay data, such as population count, voter status, senior citizens, establishments, blotter records, and revenue. The layout is user-friendly and organized with color-coded tiles for easy navigation, helping barangay staff efficiently access and manage community records.

Table 1: Survey Result for E-Barangay Information Management System (E-BIMS)

Criteria	Mean	Verbal Interpretation
Functional Usability	4.18	Agree
Performance Efficiency	4.12	Agree

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Compatibility	3.89	Agree
Usability	4.25	Agree
Reliability	4.11	Agree
Security	4.23	Agree
Maintainability	4.07	Agree
Portability	4.14	Agree
TOTAL	4.12	Agree

Based on Figure 1: Survey Result for Productivity, the E-Barangay Information Management System (E-BIMS) received an overall mean score of 4.12, showing that users were generally satisfied. The system was rated highly in usability (4.25), security (4.23), and portability (4.14), indicating it is easy to use, secure, and accessible across devices. Ratings for performance, compatibility, and maintainability (all at 4.12) reflect good speed, flexibility, and ease of updates. These results confirm that EBIMS meets user needs and performs effectively, while also pointing to areas for future improvement.

However, the compatibility criterion received a slightly lower individual score of 3.89. This was mainly because the system was developed exclusively for use on personal computers and laptops, and is designed to run as an offline system. As a result, it does not support mobile devices or tablets, and requires installation on Windows-based desktop environments. Furthermore, some users encountered minor display issues when accessing the system using outdated web browsers. The lack of online and mobile platform integration contributed to the lower compatibility rating and identified potential areas for system enhancement in future versions.

CONCLUSION

Based on the gathered data, the E-Barangay Information Management System (E-BIMS) demonstrated a high level of performance across various quality criteria under the ISO/IEC 25010:2011 Software Quality Model. With an overall mean score of 4.12, respondents agreed on the system's effectiveness, particularly highlighting its usability, portability, and security. The high ratings indicate that users find the system functional, reliable, and secure for managing barangay records efficiently. This evaluation underscores the importance of developing digital systems tailored to local governance needs. E-BIMS successfully bridges the gap between traditional manual processes and the growing demand for efficient digital management in barangays.

RECOMMENDATION

To further improve E-BIMS, developers are encouraged to focus on continuous enhancement, especially in maintaining compatibility with various devices and platforms. Regular system updates, user training, and feedback collection are recommended to keep the system responsive to users' evolving needs. Future expansions may include integration with national government databases and mobile-friendly interfaces to broaden accessibility and impact.

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