

Development and Implementation of SEIMS in One Local Community in the Philippines

Arlen A. Limen¹; Nichole E. Faulan²; Kaye B. Vegafria³; June Earl M. Estilo⁴

^{1,2,3,4}State University of Northern Negros, Philippines

Publication Date: 2026/05/27

Abstract: The Local Government Unit (LGU) of the Municipality of San Enrique currently manages employee records and business transactions through manual, paper-based processes. This traditional approach has led to significant operational challenges, including delays in leave request processing, inefficient monitoring of office expenses, misplaced interoffice communications, and unorganized employee 201 files. To address these issues, this research involved the design and development of the San Enrique Information Management System (SEIMS), a web-based and responsive platform specifically tailored for the LGU. The primary purpose of the project was to create an accurate, efficient, and secured system that automates daily activities and secures employee records. Utilizing a Development Research Design and an Agile Modeling approach, the researchers developed SEIMS with seven key features: User Account Management, Expenses Management, Leave Management, Memo Management, SMS Notification, Quick Response (QR) Code, and 201 Files Management. The principal results of the study demonstrated that the developed system effectively automates complex manual workflows. System evaluation by IT practitioners yielded a mean score of 2.38, interpreted as "Good," while a subsequent system dry-run by Municipal representatives resulted in an overall system quality score of 2.95, also interpreted as "Good". These scores indicate that the system consistently met and exceeded the required functional and non-functional specifications, providing reliable outputs and a user-friendly interface. This research indicates that SEIMS is a viable tool for resolving the record-keeping problems of the LGU. The implementation of this system is expected to increase work efficiency, provide accurate reporting, and ensure the security of sensitive data, thereby significantly improving the municipality's quality of service.

Keywords: *Internet of Things (IoT), Agile Modeling Approach, Information Management System, Quick Response Code, Web-Based Responsive System.*

How to Cite: Arlen A. Limen; Nichole E. Faulan; Kaye B. Vegafria; June Earl M. Estilo (2026) Development and Implementation of SEIMS in One Local Community in the Philippines. *International Journal of Innovative Science and Research Technology*, 11(5), 1837-1841. <https://doi.org/10.38124/ijisrt/26may797>

I. INTRODUCTION

The rapid evolution of digital services necessitates that organizational environments adapt to new technologies to reduce the time required for processing business records and transactions. According to Chen and Shang (2018), in the rapidly emerging globalization process, increasing the competitiveness of enterprises depends on enhancing their business performance. Although many methods and techniques influence business performance, innovation has become one of the most widely adopted strategies. Recent studies have shown that innovation not only boosts company performance but also plays a critical role in increasing efficiency and operational effectiveness (Alotaibi et al., 2020). For the Local Government Unit (LGU) of San Enrique, Negros Occidental, reliance on manual, paper-based operations have become a bottleneck to efficient public service. Developing a responsive web-based platform like SEIMS aligns with these findings, as such systems can modernize administrative workflows and significantly reduce delays, improve security, and streamline document management.

This study was conducted based on the LGU's current manual transactions and basic automated tools, which have led to operational challenges such as delays in leave processing, misplaced receipts, and security issues with employee files. Integrating technologies like QR codes facilitates quick, secure access to information, addressing these challenges by enabling faster processing and better tracking (Liu et al., 2019). Moreover, research on the Internet of Things (IoT) in public administration suggests that automation and interconnected systems can greatly enhance efficiency and reduce human errors (Nguyen et al., 2021).

The focus on responsive web design ensures accessibility across devices, and the incorporation of QR codes provides a secure, swift method for users to interact with the system. These innovations are deemed essential for modernizing government operations, as supported by studies emphasizing web-based systems' roles in reducing manual tasks and improving document security. Finally, SEIMS offers a tool to improve productivity, minimize errors, and simplify employee data management while laying the foundation for

integrating automated notifications and QR technology into local government systems to resolve existing administrative deficiencies.

The researchers utilized a Development Research Design combined with a Constructive Research Design to gather information and develop a practical solution to the identified organizational problems. This approach focused on the analysis, design, and implementation of a system based on observed manual workflows. For software development, the Agile Modeling Approach was applied, consisting of five phases: Exploring, Planning, Iterations to the First Release, Productionizing, and Maintenance.

II. OBJECTIVES OF THE STUDY

The main objective of this study is to design and develop an accurate, efficient, and secured responsive web-based system entitled “An Information Management System using Quick Response Code for the Local Government Unit of San Enrique, Negros Occidental”. Specifically, the project aims to develop an efficient leave management feature to ease application processing, an accurate expenses management module to monitor travel and billing transactions, and a secured user account management feature to protect employee credentials. Additionally, the system incorporates a memo management feature that utilizes SMS notifications to ensure employees receive and track documents on time.

III. MATERIALS AND METHODS

This section outlines the research design, data collection procedures, system development processes, participant involvement, validation techniques, and ethical considerations included in the study. This approach ensured the systematic and ethical execution of the project, enabling the development and validation of the proposed system in alignment with organizational needs and standards. The researchers utilized a Development Research Design combined with a Constructive Research Design to gather information and develop a practical solution to the identified organizational problems. This approach focused on the analysis, design, and implementation of a system based on observed manual workflows. For software development, the Agile Modeling Approach was applied, consisting of five phases: Exploring, Planning, Iterations to the First Release, Productionizing, and Maintenance for the entire development of the system.

➤ *Research Design*

The study utilized a Development Research Design complemented by a Constructive Research Design to systematically collect information and develop a functional solution for the organization. This design focused on analyzing existing manual workflows and using those observations as the foundation for designing a modernized system. To execute this design, the researchers applied the Agile Modeling Approach for the actual software development. This methodology is characterized by its iterative nature, allowing for continuous feedback and refinements throughout the project.

• *The Research and Development Process was Structured into Five Distinct Phases:*

- ✓ *Exploration:* In this phase, the researcher examined the environment and engaged with respondents to identify specific problems that could be addressed through automation.
- ✓ *Planning:* During this phase, solutions were planned for the identified issues, then, the researchers designed the system’s architecture and database features, such as QR code generation and SMS notifications.
- ✓ *Iterations for the First Release:* In this phase, the design was converted into code, followed by comprehensive testing and feedback collection from the benefactor to implement necessary modifications.
- ✓ *Productionizing:* In this phase, Feedback was analyzed, and final adjustments were made to ensure the system was fully functional and satisfied the client's requirements for deployment.
- ✓ *Maintenance:* After deployment, a system dry-run was performed to verify smooth operation, and a schedule for monthly bug inspections was established to sustain ongoing efficiency.

➤ *Participants and Sampling Technique*

The study focused specifically on the Local Government Unit (LGU) of San Enrique, Negros Occidental. Rather than a random sample of a total population, the study used a purposive approach by involving the specific authorized users who would interact with the system. These participants included:

- *System Administrator:* The back-end user in charge of security and account management.
- *Front-end Users:* This group comprised 67 regular employees, 83 job order employees, Department Heads, the HR Head, the Administrative Secretary, and the Municipal Mayor.

➤ *Instrument Development and Validation*

The data-gathering instrument used was a custom-made interview guide and a custom-made evaluation instrument.

• *Validation Procedures and Reliability:*

To ensure the technical accuracy and practical utility of the San Enrique Information Management System (SEIMS), the researchers implemented a rigorous validation process for their self-made research instruments. The researchers conducted validation to ensure they effectively measured the system's functionality, efficiency, and user acceptability.

- ✓ *Expert Evaluation:* The software and its functionalities were evaluated by two IT experts (jurors) to check if the system met technical requirements.
- ✓ *3-Point Likert Scale:* A rating scale was established (3-Good, 2-Acceptable, 1-Needs Improvement) to standardize the feedback from evaluators.
- ✓ *Criteria-Based Testing:* The instrument assessed specific criteria including System Source Codes, General Interaction, Delivery of Information, Data Input, Usability, System Help, and Developer Performance.

• *Data Collection Procedure:*

Data collection was conducted in distinct stages to ensure the system addressed actual needs:

- ✓ *Interviews and Observations:* The researchers conducted virtual and face-to-face interviews with the designated HR Head and staff.
- ✓ *Document Review:* Existing manual records, forms, and documents were studied to understand the current workflow.
- ✓ *System Dry-run:* A pilot test was conducted at the HR Management Office where municipal representatives evaluated the system's performance in a real-world setting.

• *Data Handling:*

All data will be anonymized and stored securely to ensure confidentiality.

• *Data Analysis:*

The primary statistical tool used for data analysis was the Weighted Mean.

- ✓ *Application:* The mean score was calculated for each evaluation criterion to determine the system's overall quality.
- ✓ *Interpretation Guide:* Scores were analyzed using a pre-made range:
 - 2.33 – 3.00: Good (Exceeded requirements).
 - 1.67 – 2.32: Acceptable (Performed essential functions with few defects).
 - – 1.66: Needs Improvement (Failed to perform required functionality).

• *Ethical Considerations:*

To ensure ethical standards were met during the study, the researchers followed these procedures:

- ✓ *Letter of Transmittal:* A formal request was sent to the Municipal Mayor to ask for permission to conduct interviews, observations, and surveys.
- ✓ *Confidentiality:* The researchers assured the LGU that all gathered data would remain confidential and be used strictly for academic purposes.

IV. RESULTS AND DISCUSSION

The development of the San Enrique Information Management System (SEIMS) was initiated to address the critical inefficiencies of the Local Government Unit (LGU) of San Enrique, Negros Occidental, which previously relied on manual, paper-based administrative processes. This traditional approach resulted in significant operational bottlenecks, including delayed leave request approvals, unorganized and insecure employee 201 Files, and the frequent misplacement of office expense records and internal memoranda. To resolve

these issues, the researchers designed a responsive web-based platform using the Agile Modeling Approach, ensuring a system that is accurate, efficient, and secured. The SEIMS integrates five core features: User Account Management, Expenses Management, Leave Management, Memo Management, and 201 Files Management, all accessible through web and mobile browsers.

One of the unique feature of the system is the utilization of Quick Response (QR) codes for secure user access and the implementation of SMS notifications to automate and track the dissemination of official memos. Technical evaluation by IT experts and system dry-runs with respondents confirmed that the software consistently performs essential functionalities with high accuracy, earning an overall quality interpretation of "Good". Beyond its technical success, the project is economically viable, with a developmental budget of Php 108,022.66 and a projected payback period of 3.65 years. Ultimately, the SEIMS provides a scalable digital solution that minimizes human error, enhances data security, and significantly improves the overall productivity of the municipality.

After the development of the software, the quality of project SEIMS was tested by applying system testing to check whether the developed software met the required system requirements. The descriptive-evaluative method was utilized to assess the quality of the developed system based on the criteria provided by the Project Screening Committee to establish a good quality system. The developed software was evaluated by two (2) IT experts; and after the system testing, a system dry-run was conducted to determine the acceptability of the system based on the standard of the stakeholders. Each evaluator was requested to assess and rate each item using the custom-made instrument set by Screening Committee using the 3-point Likert rating scale. These are:

<u>Rate</u>	<u>Interpretation</u>
3	Good
2	Acceptable
1	Needs Improvement

The results of the system evaluation were tabulated, interpreted, and analyzed by the researchers using the weighted mean. The mean score obtained was interpreted based on the pre-made interpretation guide established by the Screening Committee. These are:

➤ *On System Evaluation:*

This portion presents the system assessment that has been conducted virtually by the IT practitioners. Soon as the evaluators gave the ratings, the researchers reviewed, tabulated, and interpreted the result of the evaluation. The table 1 below presents the summary result of the system testing.

Table 1 Summary of System Evaluation

Criteria	Juror 1	Juror 2	Mean Score	Interpretation
1. System Source Codes	2.63	2.50	2.57	Good
2. General Interaction	2.50	2.30	2.40	Good
3. Delivery of Information	2.17	2.17	2.17	Acceptable
4. Data Input	2.17	2.00	2.09	Acceptable
5. Usability or user interface	2.60	2.60	2.60	Good
6. System help	2.67	1.67	2.17	Acceptable
7. Software developers' performance	2.83	2.50	2.67	Good
OVER-ALL MEAN SCORE	2.51	2.25	2.38	Good

The overall mean score of the system is 2.38, which implies that the software is of good quality, however, the delivery of information, data input, and system help must be further improved by the researchers to establish an accurate, efficient, and secured system.

After the implementation of the system, project SEIMS will be installed in the LGU of the Municipality of San Enrique

in Negros Occidental. The Municipal representatives will evaluate the acceptability of the system.

➤ *On System Dry-Run:*

This portion presents the result of the acceptance testing performed by the Municipal representatives according to the given criteria. The summary of dry-run results is shown in Table 2.

Table 10 Summary of System Dry-Run

Criteria	Mean Score	Interpretation
1. Reliability of System Outputs	3.0	Good
2. User Interface:	2.93	Good
a. General Interactions	3.0	Good
b. Information Display/Reports	3.0	Good
c. Data Input	2.8	Good
OVERALL SYSTEMS QUALITY	2.95	Good

The overall performance of the developed system has been assessed and the mean score of the reliability of system outputs of 3.0, which is interpreted as "Good," indicating that the system is performing properly and meets the project's objectives. Also, the User Interface, on the other hand, gets a mean score of 2.93, indicating that all of the requirements have been met. This indicates that the system is user-friendly and reliable for users, particularly employees, department heads, administrative secretaries, system administrators, and the municipal mayor of San Enrique's LGU. The overall system quality means the score was 2.95, indicating that the system was designed consistently and met the required system requirements which implies that, indeed, the system can be utilized for future record keeping.

The importance of this work lies in its ability to provide a high-quality, secured environment that minimizes human error and significantly reduces the time required for daily decision-making. Evaluation results from IT experts and stakeholders confirm that the system exceeds basic requirements, offering a scalable model for digital transformation in small-to-medium-sized municipalities. Beyond its immediate utility, SEIMS demonstrates how localized technological innovation can enhance transparency and productivity within the public sector.

Based on the successful development and initial testing of the system, the researchers recommend the following for long-term sustainability and enhancement:

V. CONCLUSION AND RECOMMENDATION

The development of the San Enrique Information Management System (SEIMS) successfully addresses the operational bottlenecks inherent in the Local Government Unit's previous manual, paper-based workflows. By transitioning from pen-and-paper transactions to a responsive web-based platform, the LGU of San Enrique has effectively modernized its core administrative functions, including leave administration, expense monitoring, 201 file security, and internal communication. The integration of Quick Response (QR) codes and SMS notifications specifically resolves the long-standing issues of delayed approvals and misplaced physical documents.

- *Full-Scale Implementation:* The LGU should formally adopt SEIMS as the primary management tool for all 16 departments to ensure uniform data handling and communication.
- *Comprehensive User Training:* A structured training program should be conducted for all front-end users, including department heads and regular employees, to maximize system utilization and data accuracy.
- *Module Expansion:* Future iterations of the system could be extended to include currently excluded features such as Payroll Management, Attendance Management (Biometric integration), and Budget Monitoring to create a truly all-in-one Human Resource and Financial suite.
- *Regular Technical Maintenance:* Monthly system checks for bugs or errors should be maintained to ensure the

platform continues to run smoothly and remains secure against data breaches.

- *Security Enhancements*: Continuous research into further securing personal and private information within the database is recommended to maintain the trust of the organization and its employees.

REFERENCES

- [1]. Agustin, J. T., & Babaran, C. L. Jr. (2021). Guidance records management system with SMS notification. <http://tjct.isujournals.ph/index.php/tjct/article/view/14>.
- [2]. Alotaibi, R., Alshamrani, A., & Alzahrani, A. (2020). Implementation and impacts of web-based management systems in government agencies. *Government Information Quarterly*, 37(4), 101498. <https://doi.org/10.1016/j.giq.2020.101498>.
- [3]. Ashish, A. S., et al. (2021). Web-based expense approval system. <https://web.p.ebscohost.com/abstract?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=09765697&AN=152178489&h=vw2xoovqtSFg4BYdUsPdh u8xM7bILcq%2b8zYZ8Qs77askPtq6W7htHTs%2bn GShZ3rPjKzg9DOpwrhw3LCbtWwQ%3d%3d&crl=c&resultNs=>
- [4]. Chen, J. V., & Shang, R. A. (2018). The impact of technological innovation on organizational performance: A mediating role of organizational learning. *Journal of Business Research*, 88, 448-455. <https://doi.org/10.1016/j.jbusres.2017.11.022>.
- [5]. Liu, Y., Zhang, H., & Wang, Q. (2019). The application of QR codes in organizational workflows: Enhancing security and efficiency. *Information & Management*, 56(8), 103-115. <https://doi.org/10.1016/j.im.2019.103114>.
- [6]. Mendoza, A. R., et al. (2019). Electronic document management system implementing Internet of Things (IoT). *International Journal of Advanced Research in Computer Science*, 10(5), 1-6. <http://www.ijarcs.info/index.php/Ijarcs/article/view/6377>.
- [7]. Mynavathi, R., et al. (2019). Web-based student information management system. *International Journal of Innovative Research in Science, Engineering and Technology*, 8(3), 10097-10104. http://www.ijisrt.com/upload/2019/march/36_ICACS E181_V.pdf.
- [8]. Nguyen, T., Lee, S., & Kim, H. (2021). The impact of IoT and automation on public administration: A review of recent advances. *Government Information Quarterly*, 38(2), 101543. <https://doi.org/10.1016/j.giq.2021.101543>.
- [9]. Napit, B. (2021). Abstract of MemoDroid: A web and mobile memo notification app. <https://www.inettutor.com/abstract/abstract-of-memodroid-a-web-and-mobile-memo-notification-app/>.
- [10]. Ramanan, M. (2021). Web-based leave management system for University College of Jaffna. <https://jrte.org/wpc/content/uploads/2021/07/Web-Based-Leave-Management-System-for-University-College-of-Jaffna.pdf>
- [11]. Shamil, F. R. (2019). Information management system (IMS) – Components, uses. <https://t4tutorials.com/information-management-system-ims-components-uses/>.
- [12]. Thawadee, N., & Mekruksavanich, S. (2021). A web-based information management system for scientific research. *IEEE Xplore*. <https://doi.org/10.1109/ICSESS51809.2021.9425732>.
- [13]. Weedmark, D. (2019). The features of an information management system. <https://smallbusiness.chron.com/features-information-management-system-2114.html>.