



Design and Implementation of a Brokerage Selling and Rental Management Portal

**James Kennan Desabille¹; Richard P. Cueva²; Rosa Mae Garcia³;
Dino L. Ilustrisimo, PhD⁴; Janey O. Boljoran⁵; Cristel Joy Batobalunos⁶;
Clinton Jay Villacin⁷; Rafael Villaceran⁸; Kurt Bryan S. Alegre, MIT (C)⁹**

^{1,2,3,4,5,6,7,8,9}Department of Information Technology, Madridejos Community College, Madridejos, Cebu, Philippines

¹kennandesabille24@gmail.com; ²pacificorichard08@gmail.com; ³rosamaegarcia704@gmail.com;
⁴dino.ilustrisimo@mcclawis.edu.ph; ⁵janey.boljoran@mcclawis.edu.ph; ⁶crsiteljoy.batosbalonos@mcclawis.edu.ph;
⁷clintonjay.villacin@mcclawis.edu.ph; ⁸rafael.villaceran@mcclawis.edu.ph; ⁹kurtbryan.alegre@mcclawis.edu.ph

DOI: <https://doi.org/10.47760/ijcsmc.2026.v15i03.013>

Abstract: This study focuses on the design, development, and evaluation of an integrated Design and Implementation of a Brokerage Selling and Rental Management Portal aimed at enhancing operational efficiency and customer satisfaction in the real estate sector. Traditional real estate brokerage and property management processes involve numerous manual tasks, including documenting transactions, managing property listings, and ensuring legal compliance, which can lead to inefficiencies, delays, and potential errors. Recognizing these challenges, the study proposed a unified portal that consolidates both brokerage selling and rental management functionalities into a single, user-friendly platform. The system allows users to create, read, update, and delete (CRUD) functionalities broker, agent, and property information, thereby centralizing essential data for streamlined access and improved transaction oversight. The development process employed the Rapid Application Development (RAD) methodology, characterized by iterative prototype cycles, rapid testing, and continuous refinement based on feedback from administrators and IT experts. This approach enabled the researchers to design a system aligned with end-user needs, ensuring that functional requirements were effectively met. System quality was evaluated using the ISO/IEC 25010:2023 software quality framework, focusing on attributes such as Functional Suitability, Performance Efficiency, Compatibility, Reliability, and Security. Results demonstrated very satisfactory to excellent scores across all metrics, with a total mean of 4.96, reflecting strong performance, dependability, and secure handling of data. In addition, usability was assessed using the USE Questionnaire, which measures Usefulness, Ease of Use, Ease of Learning, and User Satisfaction. The portal achieved a perfect mean score of 5.00 in all categories, indicating that users strongly agreed with its ease of operation and overall usefulness.

Keywords: ISO/IEC 25010:2023, Property Management System, Rapid Application Development, Real Estate Brokerage, Rental Management Portal, USE Questionnaire

I. INTRODUCTION

Real estate brokerage and property management are professional services that require adherence to established legal standards and regulatory frameworks. In the Philippines, these services are governed by the Real Estate Service Act (Republic Act No. 9646), which regulates the professional practice of brokers, agents, and appraisers under the supervision of the Professional Regulation Commission [7]. These professionals play a vital role in facilitating property transactions, coordinating communication between buyers and sellers, preparing documentation, and ensuring that all transactions comply with legal and regulatory requirements.

In recent years, the rapid advancement of Property Technology (PropTech) has significantly transformed traditional real estate operations. Emerging technologies such as blockchain frameworks, digital property platforms, and data-driven management systems have been proposed to improve transparency, security, and operational efficiency in property transactions [1]. Blockchain and NFT applications in real estate systems have demonstrated the potential to enhance transaction authentication, ownership verification, and fraud prevention [1][9]. Furthermore, document verification mechanisms and data-matching techniques have been explored to strengthen the reliability and security of real estate documentation within digital systems [3].

Despite these technological developments, many brokerage offices particularly those operating in smaller municipalities continue to rely heavily on manual documentation processes, fragmented property listings, and limited digital record-keeping [1][3]. These traditional practices often result in operational inefficiencies, delays in property transactions, difficulties in tracking brokerage records, and challenges in managing property information effectively [8]. As the demand for faster and more reliable property transactions increases, the need for integrated digital solutions that can streamline brokerage operations becomes more significant [7].

Although previous studies have explored blockchain-based real estate platforms and decentralized property systems [8], relatively few studies have focused on the design and evaluation of centralized brokerage management portals tailored for local brokerage operations. To address this gap, the present study focuses on the design and development of a Brokerage Selling and Rental Management Portal that centralizes brokerage and rental management activities into a unified digital platform. The system enables administrators, brokers, and agents to manage property listings, broker and agent records, and customer inquiries through a structured and user-friendly interface.

Through these evaluation frameworks, the study aims to provide a validated digital solution that can improve brokerage and rental management operations, particularly for community-based real estate environments that require efficient, organized, and accessible property management systems.

Despite the benefits of the developed system, several limitations must be acknowledged. The system evaluation was conducted within selected municipalities in Bantayan Island, which may limit the generalizability of the findings to larger urban real estate environments with more complex transaction workflows. In addition, the evaluation involved a limited number of respondents consisting of IT experts and real estate professionals, which may influence the representativeness of the results. Furthermore, the system was tested within a controlled evaluation environment and did not undergo long-term operational testing under large-scale transaction conditions. Future studies may expand the scope of evaluation by involving a larger group of respondents, conducting long-term system performance testing, and integrating advanced technologies such as automated property analytics or blockchain-based verification systems.

1.1 Objectives of the Study

This study aims to develop a Brokerage Selling and Rental Management Portal.

Specifically, it aims to:

1. Develop a system which aims:
 - 1.1 To perform CRUD operation such as create, read, update and delete broker details, agent details, property details, and property images.
 - 1.2 To display on the system dashboard the number of properties, brokers, agents, houses, apartments, on sale data, and rental data.
 - 1.3 To access the system of brokerage selling and rental management portal features through a web server.
 - 1.4 To develop a mobile application for Android Users.
2. Evaluate the system based on the ISO/IEC 25010:2023 software quality characteristics:
3. Assess the system usability using the USE Questionnaire in terms of:

II. METHODOLOGY

This study utilized a developmental research methodology focusing on systematic product design, development, and evaluation [7]. The Rapid Application Development (RAD) model guided the system creation process.

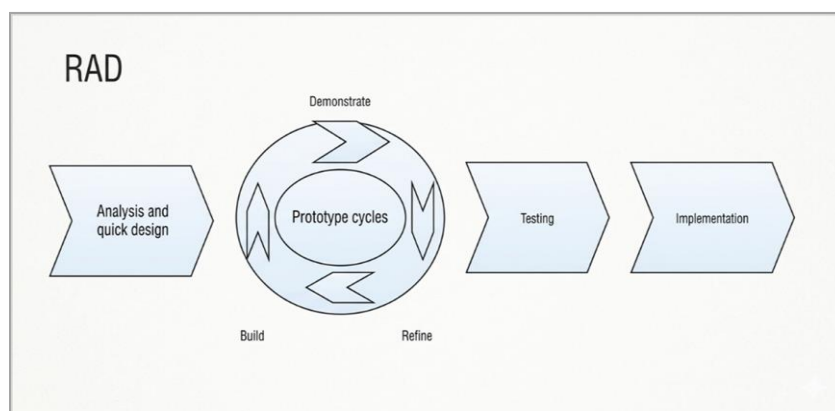


Figure 1. Rapid Application Development Model.

Stage 1: Analysis and Quick Design

During this phase, the researchers assessed the system's functionalities and components, focusing on addressing difficulties in publishing properties and locating properties currently available or expected in the future.

Stage 2: Prototype Cycles (Develop, Demonstrate, Refine)

After consultation with administrators, the Design and Implementation of a Brokerage Selling and Rental Management Portal was scoped based on feedback. A system prototype was created and presented for testing. Errors and identified flaws were corrected, and refinements were implemented through continuous collaboration between the developers and administrators. This iterative cycle continued until the system met all defined scopes and design expectations.

Stage 3: Testing

The system was developed using the Rapid Application Development (RAD) methodology, which emphasizes rapid prototyping, iterative system development, and continuous refinement based on user feedback [7]. The developed portal was evaluated using the ISO/IEC 25010:2023 software quality model to measure key quality attributes such as functionality, performance efficiency, compatibility, reliability, and security [2]. In addition, usability evaluation was conducted using the USE Questionnaire, which assesses user perceptions in terms of usefulness, ease of use, ease of learning, and satisfaction [4].

Stage 4: Deployment

The final stage involved launching the brokerage selling and rental management portal. Users were provided with appropriate training, and system performance was closely monitored to ensure consistent and effective operation.

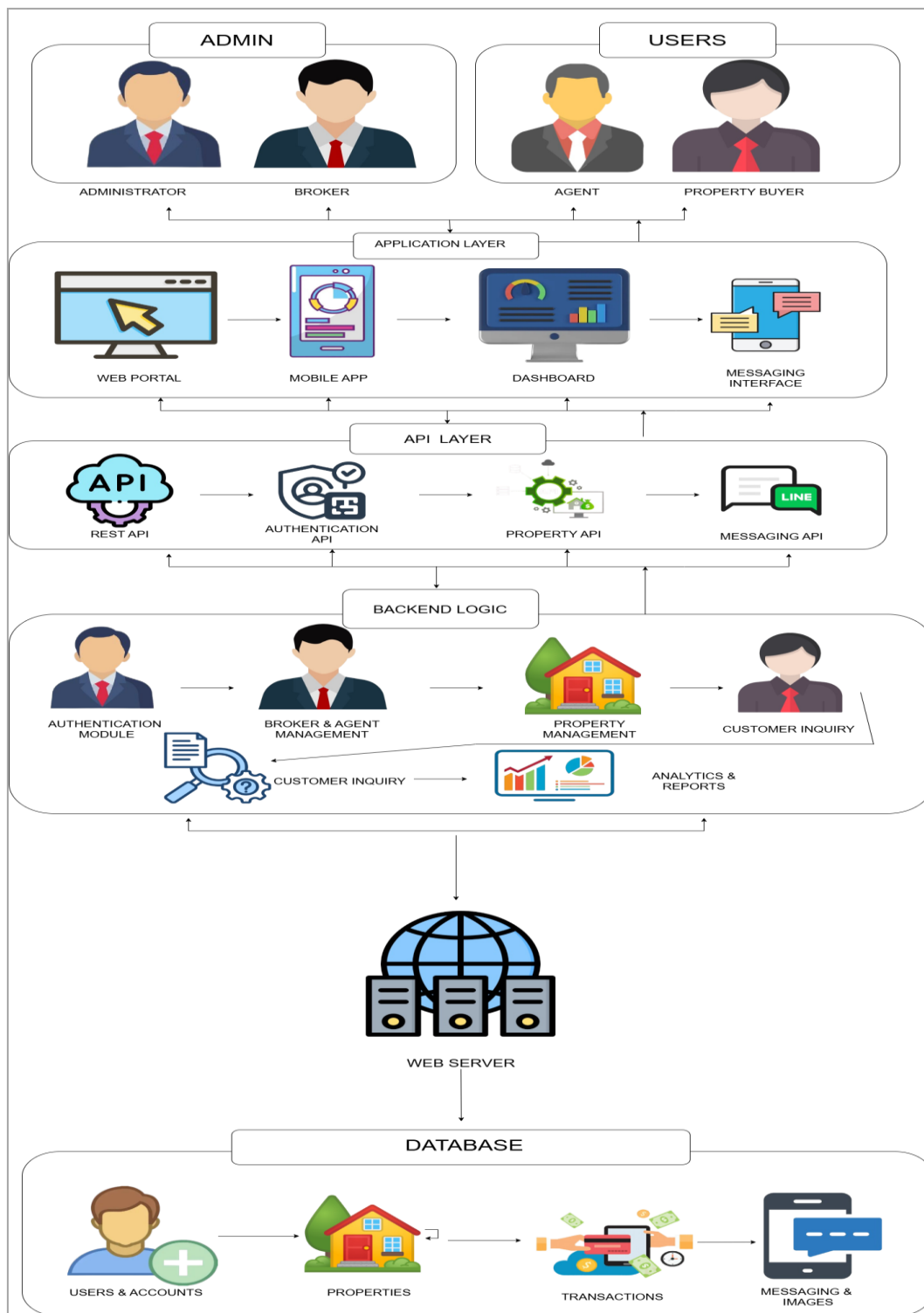


Figure 2. System Architecture

The System Architecture illustrates how different components of the Brokerage Selling and Rental Management Portal interact with each other. It shows the flow of data from the users, through the application interface, API services, backend processing, web server, and finally to the database where information is stored.

The architecture follows a layered structure to ensure organized processing, efficient communication between components, and secure data management.

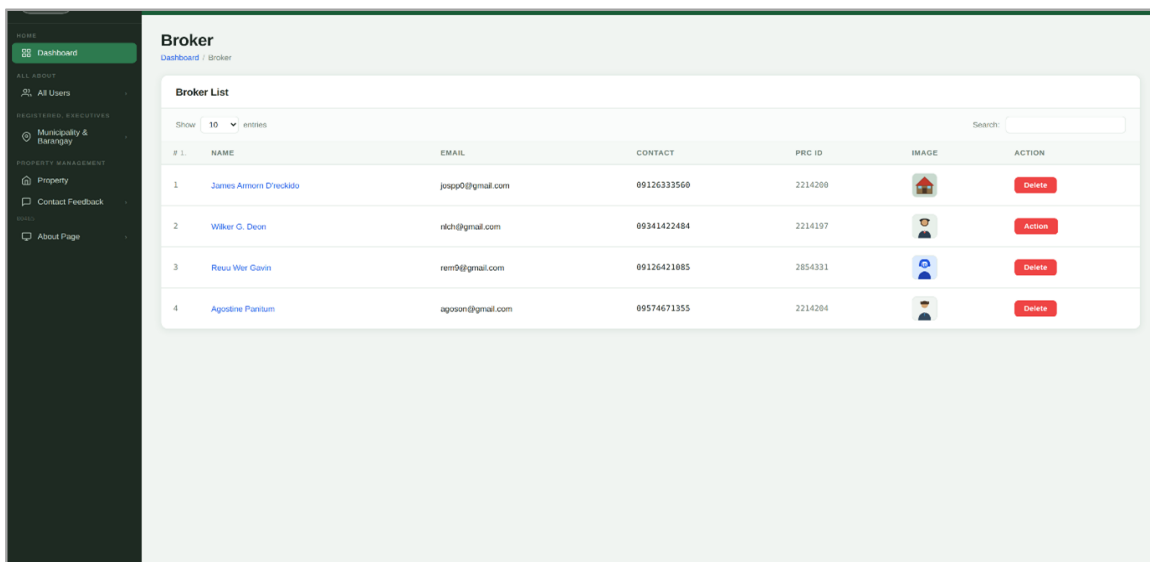


Figure 3. Broker CRUD Interface

Figure 3 presents the broker management interface of the system. This section allows administrators to perform Create, Read, Update, and Delete (CRUD) operations for broker records. Through this interface, administrators can add new broker information, view existing records, update broker details, and remove outdated or inactive broker profiles from the system.

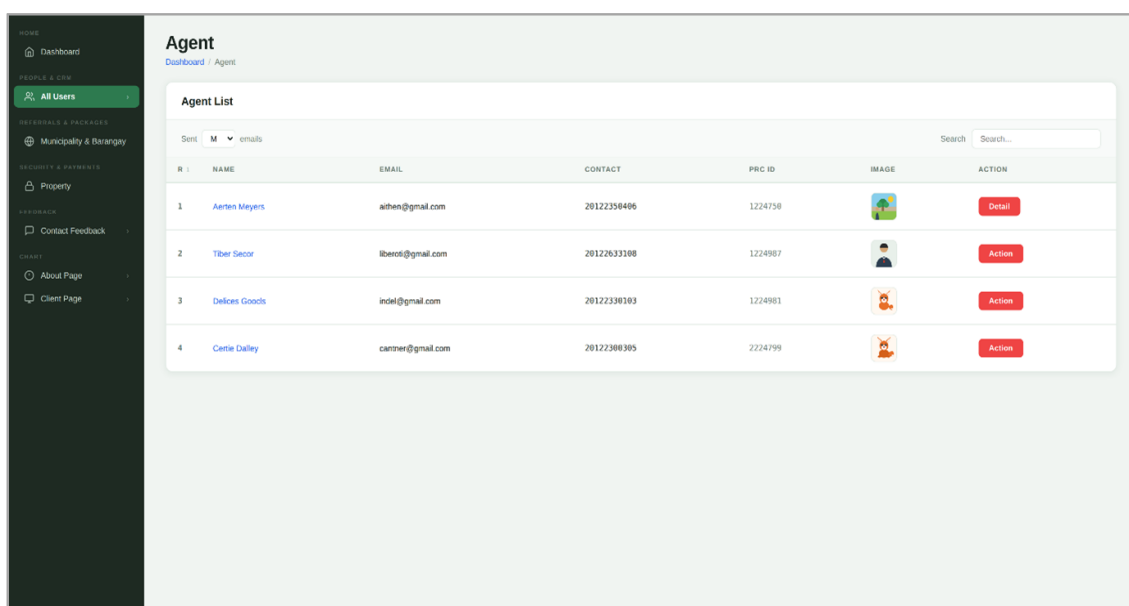


Figure 4. Agent CRUD Interface

Figure 4 shows the agent management interface where administrators can manage agent records. The interface enables administrators to view agent information, update agent details, and remove agent records when necessary. This module helps maintain accurate and organized agent data within the brokerage management portal.

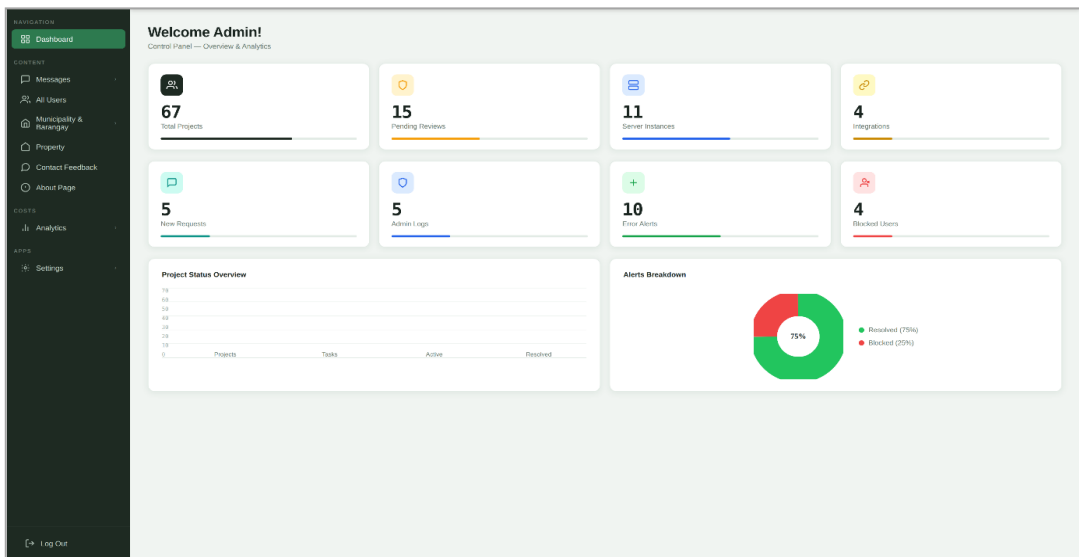


Figure 5. Administrator Dashboard

Figure 5 shows the administrator dashboard interface of the system. The dashboard provides a visual overview of important system data, including the total number of properties, brokers, agents, houses, apartments, and property listings available for sale or rent. The bar graph displayed on the dashboard represents pricing data for properties, allowing administrators to monitor property values and system statistics efficiently.

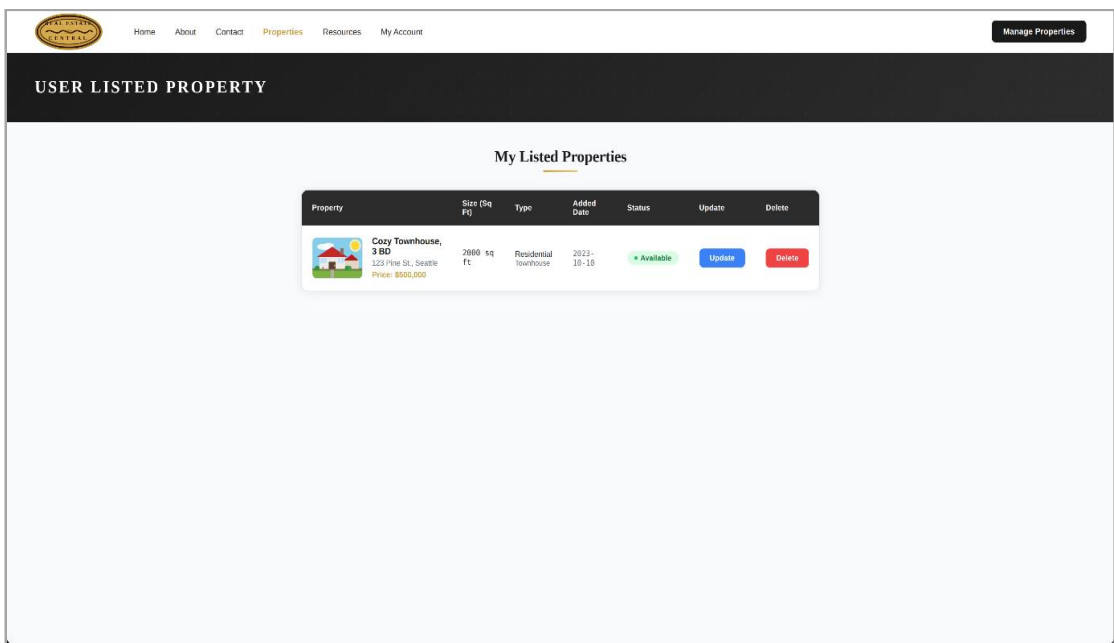


Figure 6. Property Management Interface

Figure 6 illustrates the property management module of the system. This interface allows brokers and agents to perform CRUD operations on property listings, including adding new properties, viewing available listings, updating property details, and removing properties that are no longer available. The module also supports uploading property images and organizing property data for easier management and presentation to potential buyers or renters.

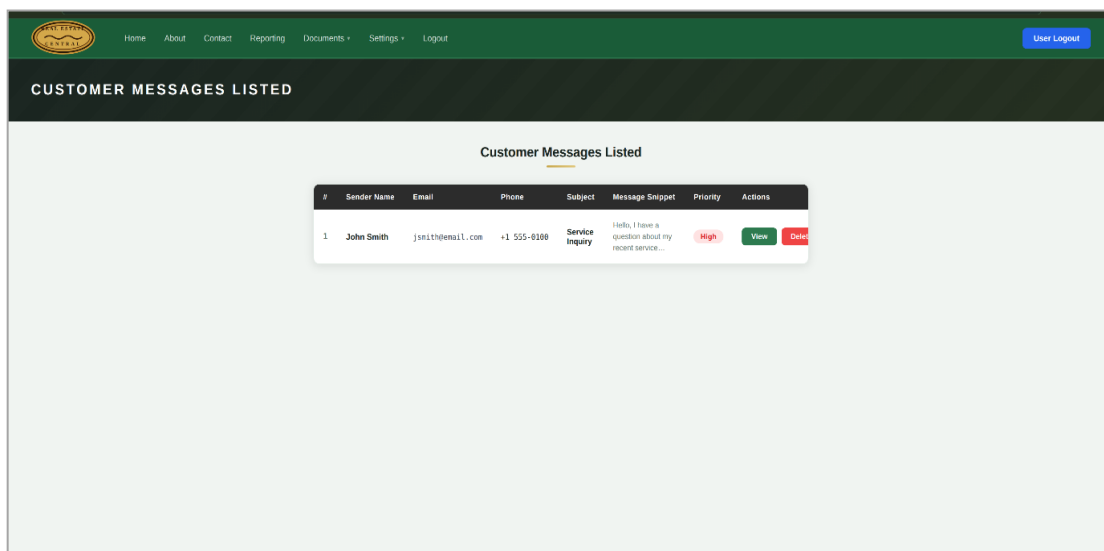


Figure 7. Customer Messages Listed

Figure 7 Displays the customer messaging interface of the system. This section allows brokers and agents to view inquiries submitted by customers through the portal. Users can read messages, respond to inquiries, and delete messages when necessary. This feature improves communication between property clients and brokerage professionals.

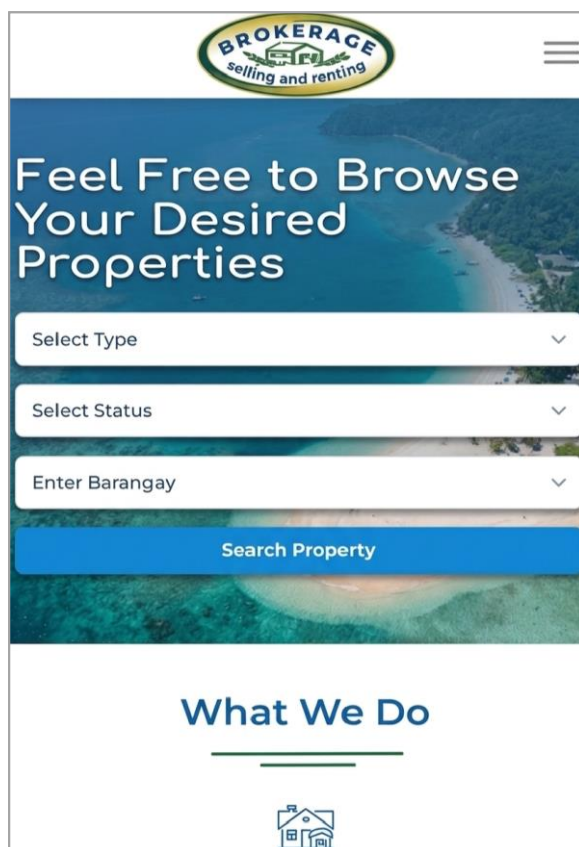


Figure 8. Mobile Application Interface

Figure 8 Shows the mobile application interface of the Brokerage Selling and Rental Management Portal. It allows users to browse and manage property listings, view details, and use search and filter features for easier navigation. The interface is designed to be user-friendly and supports convenient, real-time access to the system through mobile devices.

III. RESULTS

TABLE I. Evaluation of Broker, Agent, and Property Management Functionalities.

Criteria	Mean	Verbal Interpretation
Perform CRUD operation such as create, read, update and delete broker details, agent details, property details, and property images.	5.00	Excellent
The systems display the dashboard number of properties, brokers, agents, houses, apartments, on sale data, and rental data.	5.00	Excellent
How effective is the brokerage selling and rental management portal features when being use online.	5.00	Excellent
How effective is the brokerage selling and rental management portal in term of responsiveness	5.00	Excellent
Total	5.00	Excellent

Demonstrates that all core CRUD functionalities achieved a perfect mean score of 5.00 across all functional tasks, including managing broker/agent details and property listings. This is interpreted as Excellent. The system shows the results of I.T experts feedback in testing or using the brokerage selling and rental management portal system, in term of displaying the dashboard, it was rated with mean value of 5.00, which is interpreted as excellent. The system shows how effective the brokerage selling and rental management portal features are when being used online it was rated with mean value of 5.00, which is interpreted as excellent.

TABLE II. Results of the Brokerage Portal Evaluation Based on ISO/IEC 25010:2023 Software Quality Model.

Criteria	Mean	Verbal Interpretation
Functional Suitability.	4.88	Very Satisfactory
Performance Efficiency	5.00	Excellent
Compatibility	4.95	Very Satisfactory
Reliability	5.00	Excellent
Security	5.00	Excellent
Total	4.96	Very Satisfactory

Shows that the portal achieved an overall ISO/IEC 25010:2023, the system received a Total Mean of 4.96. While Performance Efficiency, Reliability, and Security scored a perfect 5.00, Functional Suitability (4.88) and Compatibility (4.95) were rated as Very Satisfactory

TABLE III. System Usability Evaluation in Terms of Usefulness, Satisfaction, and Ease of Use

Criteria	Mean	Verbal Interpretation
Usefulness	5.00	Strongly Agree
Ease of Use	5.00	Strongly Agree
Ease of Learning	5.00	Strongly Agree
Satisfaction	5.00	Strongly Agree
Total	5.00	Strongly Agree

Presents usability results, where all USE questionnaires, the system achieved a perfect Mean of 5.00 in all categories (Usefulness, Ease of Use, Ease of Learning, and Satisfaction), resulting in a verbal interpretation of Strongly Agree.

Compared with previous blockchain-focused real estate systems that emphasize decentralized security mechanisms [1][9], the present study demonstrates that centralized operational integration combined with standardized quality evaluation can achieve comparable reliability while improving day-to-day workflow efficiency in local municipalities.

These findings validate the effectiveness of combining ISO-based quality assessment and usability validation within applied brokerage management systems.

IV. DISCUSSIONS

The results of the study demonstrate that the developed Brokerage Selling and Rental Management Portal achieved high evaluation scores across both software quality and usability metrics. The overall system quality rating of 4.96, based on the ISO/IEC 25010 framework [2], indicates that the system performs reliably and meets the functional requirements necessary for effective brokerage and rental management.

In particular, the perfect scores obtained in Performance Efficiency, Reliability, and Security suggest that the system provides stable operation and effective protection of stored data. These characteristics are essential in real estate management systems where accurate record-keeping and secure information handling are critical for maintaining trust among brokers, agents, and clients.

The results also align with previous research emphasizing the importance of secure and efficient digital systems in real estate operations. Studies exploring blockchain-based property management frameworks have highlighted the need for transparent and secure transaction systems to improve property management processes [1][9]. Although blockchain-focused systems emphasize decentralized transaction verification, the present study demonstrates that centralized digital platforms can also effectively enhance operational efficiency within brokerage environments.

Furthermore, document verification mechanisms and data-matching approaches proposed for blockchain-supported real estate systems aim to improve transaction reliability and data integrity [3]. While these approaches focus on advanced verification technologies, the developed portal in this study emphasizes practical operational management features that support day-to-day brokerage activities.

The perfect usability score obtained using the USE Questionnaire [4] indicates that respondents perceived the system as highly useful and easy to operate. According to Lund's usability framework, systems that demonstrate high ratings in usefulness, ease of use, and user satisfaction are more likely to achieve successful adoption in real operational environments. The results therefore suggest that the user-centered development approach applied in the study contributed to the creation of an intuitive and efficient system interface.

Additionally, the development process followed the Rapid Application Development methodology, which emphasizes iterative prototyping and continuous refinement through user feedback [7]. This approach likely contributed to the high usability and system quality ratings observed in the evaluation results.

Overall, the findings indicate that the developed portal provides a reliable and user-friendly digital solution capable of improving brokerage and rental management processes. The integration of standardized software quality evaluation and usability assessment further strengthens the credibility and practical relevance of the developed system.

V. CONCLUSIONS

This study successfully designed, developed, and evaluated a centralized Brokerage Selling and Rental Management Portal aimed at improving operational efficiency and user experience in local real estate environments. The system effectively consolidates broker, agent, and property management activities into a single digital platform, addressing the prevalent reliance on manual documentation, fragmented property listings, and inefficient processes identified in smaller municipalities—a key research gap highlighted in prior studies.

By implementing CRUD functionalities, a dynamic dashboard, and mobile accessibility, the portal directly mitigates the inefficiencies and delays previously observed in traditional brokerage operations. The evaluation using the ISO/IEC 25010:2023 framework and the USE Questionnaire confirmed that the portal is highly functional, reliable, secure, and user-friendly, with strong performance in all measured quality and usability metrics.

The study's approach provides a practical solution to the research gap by demonstrating that a centralized, standardized, and user-focused digital platform can achieve the operational effectiveness, transparency, and accessibility previously sought in blockchain-focused or fragmented property management systems. In doing so, it empowers brokers, agents, and administrators to manage property transactions efficiently while maintaining data integrity and compliance with regulatory requirements.

Future enhancements may include system scalability for larger urban markets, integration of advanced analytics for property insights, and optional blockchain-based verification mechanisms to further strengthen security and ownership validation. By addressing the identified research gap, the developed portal provides a replicable model for modernizing brokerage operations in community-based real estate contexts.

ACKNOWLEDGEMENT

The researchers would like to express their sincere gratitude to their academic adviser, Kurt Bryan S. Alegre, for his guidance, encouragement, and valuable insights throughout the development of this study. His expertise and constructive feedback greatly contributed to the successful completion of this research.

Janey O. Boljoran would like to express appreciation to my family and friends for their continuous support, motivation, and encouragement throughout the research process.

Cristel Joy Batobalonus extends heartfelt gratitude to my family for their unwavering support and understanding, which provided the inspiration and determination needed to complete this study.

Clinton Jay Villacin would like to acknowledge the support of my family, peers, and mentors whose encouragement and assistance contributed significantly to the development of this research project.

Rafael Villaceran expresses sincere appreciation to my family and colleagues for their guidance, support, and motivation during the completion of this study.

The researchers also extend their gratitude to the IT experts, real estate professionals, and evaluators who participated in the system testing and validation process. Their valuable feedback and technical insights greatly contributed to improving the quality and reliability of the developed system.

REFERENCES

- [1]. Hassan, M., Raafat, M., & Mansour, H. (2024, March). *My real estate: Revolutionizing real estate transactions and ownership management with blockchain and NFTs*. In 2024 6th International Conference on Computing and Informatics (ICCI) (pp. 437–442). IEEE. <https://doi.org/10.1109/ICCI61671.2024.10485078>
- [2]. International Organization for Standardization. (2023). *Systems and software engineering—Systems and software quality requirements and evaluation (SQuARE)—Product quality model* (ISO/IEC Standard No. 25010:2023). <https://www.iso.org/standard/78176.html>
- [3]. Lin, H., Dias, T., & Correia, M. (2025). *Document data matching for blockchain-supported real estate*. arXiv. <https://doi.org/10.48550/arXiv.2512.24457>
- [4]. Lund, A. M. (2001). Measuring usability with the USE questionnaire. *Usability Interface*, 8(2), 3–6.
- [5]. Philippine Professional Regulation Commission. (2022). *Implementation of the Real Estate Service Act of the Philippines (Republic Act No. 9646)*. <https://www.foreclosurephilippines.com/wp-content/uploads/2010/07/RESA-IRR.-RA-9646.pdf>
- [6]. Podshivalov, T. P. (2022). Improving implementation of the blockchain technology in real estate registration. *The Journal of High Technology Management Research*, 33(2), Article 100440. <https://doi.org/10.1016/j.hitech.2022.100440>
- [7]. Richey, R. C., & Klein, J. D. (2005). Developmental research methods: Creating knowledge from instructional design and development practice. *Journal of Computing in Higher Education*, 16(2), 23–38. <https://doi.org/10.1007/BF02961473>
- [8]. Syed, A. M. (2024). Distribution of PropTech benefits to stakeholders of the real estate market. In *Blockchain in real estate: Theoretical advances and new empirical applications* (pp. 169–178). Springer Nature Singapore.
- [9]. Yang, J. (2024). Application of blockchain technology in real estate transactions: Enhancing security and efficiency. *International Journal of Global Economics and Management*, 3, 113–122. <https://doi.org/10.62051/ijgem.v3n3.14>