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eTitulo: A Smart Solution Property Listing Lot Reservation and Documentation

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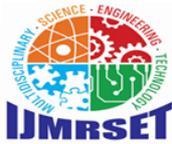
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ABSTRACT: This study presents a web-based real estate management system designed to improve property listing, verification, and transaction security in Surigao del Sur. The project addresses common issues such as unreliable property information, unverified agents, and the risk of fraudulent land transactions, which often hinder informed decision-making and stakeholder trust. Using a descriptive-developmental research design, the system integrates verified agent matching, authenticated property listings, and secure digital lot reservation features to support buyers, sellers, and real estate practitioners. A centralized database enables organized storage of ownership records, property details, and agent credentials, while the web-based platform provides accessible and transparent real estate information. System evaluation was conducted using the ISO/IEC 25010 software quality standards to assess functional suitability, usability, reliability, and security. The results indicate a high level of system acceptability, demonstrating that the proposed system effectively enhances transparency, supports secure transactions, and improves real estate management processes in Surigao del Sur.



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KEYWORDS: Real Estate Management System, Web-Based Application, Property Verification, Digital Lot Reservation, ISO/IEC 25010

I. INTRODUCTION

The real estate sector in Surigao del Sur plays a vital role in supporting the region's economic development, community growth, and long-term land management. Property transactions ranging from land acquisition to housing development are essential activities for individuals, investors, brokers, and local institutions. Land ownership holds significant cultural and financial value in the province, making accurate record-keeping and secure documentation important components of local development. As demand for residential, commercial, and agricultural properties continues to expand, more buyers, sellers, and brokers participate in land-related transactions. This increasing activity highlights the importance of having reliable information about property listings, ownership details, and agent credentials. Access to clear and organized real estate data helps stakeholders make informed decisions, supports sustainable land use, and encourages confidence in property dealings. Modern approaches to real estate management emphasize the use of digital platforms, organized databases, and accessible information systems.

Ramos and Bautista (2021) highlighted the effectiveness of web-based property management systems in improving data accessibility and fostering confidence among buyers and sellers in rural areas, including Surigao del Sur. Agosto and Burdeos (2022) examined how key macroeconomic indicators influence housing prices in the Philippines. Using national economic data, the study analyzed variables such as GDP growth, inflation, interest rates, and population trends to determine their relationship with property values.

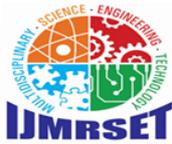
Although existing literature emphasizes the benefits of digital platforms in improving transparency, enhancing security, and increasing user engagement in real estate transactions, there is limited research on systems that integrate these features into a single, unified application tailored to local real estate environments such as Surigao del Sur. Current studies do not fully address the need for a platform that combines verified agent matching, property data authentication, fraud detection mechanisms, and secure digital lot reservation processes. Moreover, while digital tools for real estate listings exist, there is a lack of research focusing on localized solutions that specifically verify ownership documents, validate developer credentials, and ensure the legitimacy of lot reservations critical components for safeguarding stakeholders in rapidly developing provincial markets. This gap highlights the need for a comprehensive, region-specific digital application that supports users throughout the entire real estate transaction process.

II. REVIEW LITERATURE

The successful implementation of digital real estate management systems depends on the effective integration of technological tools that promote transparency, accessibility, and efficiency in handling property-related data. In many real estate environments, traditional processes for managing property listings, reservations, and documentation still rely on manual record-keeping, fragmented databases, and paper-based transactions, which often compromise data accuracy, reduce transparency, and delay transaction processing. Previous studies and system development initiatives emphasize that transforming these conventional practices into centralized, web-based workflows significantly enhances operational efficiency, data reliability, and communication among buyers, sellers, brokers, and administrators. In this context, the present study reviews related literature on web-based real estate platforms, property data verification technologies, blockchain-supported documentation, recommendation systems, and standardized system evaluation models to establish the theoretical and empirical foundations for the development of eTitulo.

Investment decisions among Filipino millennials and Generation Z are influenced by risk tolerance, perceived property value, and concerns about illegal real estate activities. Lack of transparent, real-time information can discourage young investors from participating in the market. Studies suggest that improving data accessibility and transparency encourages sustainable growth and safer investments, according to Gumasing and Niro (2023). eTitulo addresses this need by offering accurate, centralized property data and streamlined documentation for users.

Comprehensive reforms in real property valuation and assessment have been introduced to modernize tax administration and enhance local government revenues. These reforms reorganize administrative structures, provide tax amnesty, and allocate funds to ensure fairness and accuracy in property-related processes. Legal frameworks such as Republic Act No. 12001 (2024) support the use of digital platforms for more efficient property management. By following these



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regulations, systems like eTitulo can improve operational compliance and facilitate secure listing, reservation, and documentation processes.

To summarize, previous studies consistently indicate that digital real estate management systems—particularly those utilizing centralized web-based platforms—significantly enhance operational efficiency, data accuracy, and transaction transparency. The integration of verified property listings, secure digital lot reservation processes, intelligent data organization, and standardized system evaluation using ISO/IEC 25010 aligns eTitulo with current research trends in software quality, property information systems, and secure real estate transaction management. These findings support the development of eTitulo as a localized and reliable digital solution for improving property listing, reservation, and documentation processes.

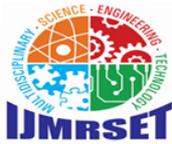
Table 1. Summary of Relevant Literatures

No.	Paper Title	Author Name	Key points	Remarks
1	Property Development and Value Enhancement in Real Estate	Matemilola & Muraina (2023)	Emphasized the importance of structured documentation of buildings, and ownership rights in property development.	Provides theoretical basis for eTitulo's focus on organized property documentation and management.
2	Artificial Intelligence Applications in Real Estate Analytics	Veluru (2023)	Applied AI techniques such as SARIMA, K-Means clustering, PCA, and sentiment analysis to improve property price forecasting and market segmentation.	Supports the use of data-driven and intelligent features in eTitulo for accurate property listings and decision support.
3	Blockchain-Based Smart Contracts in Real Estate Transactions	Yang (2024)	Highlighted the benefits of blockchain in improving transparency, security, and efficiency while noting regulatory and technical challenges.	Informs eTitulo's secure transaction and documentation design while emphasizing regulatory compliance.
4	Web-Based Property Management Systems in the Philippines	Villasin Encarnacion (2024)	& Found that Filipino real estate professionals prefer integrated web-based systems over fragmented tools.	Validates the need for eTitulo as a centralized real estate platform.
5	Real Estate Investment Behavior of Filipino Millennials and Gen Z	Gumasing & Niro (2023)	Identified transparency and access to real-time data as key factors influencing young investors.	Supports eTitulo's goal of improving transparency and data accessibility.

Based on the study findings and system evaluation, it can be concluded that eTitulo effectively addresses key challenges in the real estate industry, including fraud prevention, inaccurate property data, and delayed documentation. By implementing automated and verified processes, the system ensures secure and transparent transactions for clients, agents, and administrators alike. Its user-friendly interface, real-time updates, and account authentication features enhance the reliability and efficiency of property listing, reservation, and document management, making eTitulo a comprehensive solution for modern real estate operations.

III. METHODOLOGY

To guide the development, the researchers adopted the Agile methodology, an iterative approach that emphasizes flexibility, collaboration, and continuous improvement. Agile was selected because it allowed the researchers to build



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the system in increments, ensuring that each feature was developed, tested, and refined based on feedback. Instead of waiting until the end of the process to evaluate the system, Agile made it possible to incorporate stakeholder input throughout the development cycle.

A. Research Design

The Agile methodology was selected for its adaptability and strong emphasis on user collaboration. Each sprint consisted of planning, design, development, and testing phases, allowing the research team to implement the system incrementally and make real-time adjustments based on user feedback. This iterative approach ensured transparency, faster development cycles, and early identification of potential issues, thereby supporting the successful development of eTitulo in automating property listing, lot reservation, and documentation processes.

B. System Development

Development of the eTitulo system began with a requirements analysis conducted through interviews and surveys with key real estate stakeholders, including property owners, licensed agents, potential buyers, and system administrators. The identified requirements focused on verified property listings, secure user authentication, digital lot reservation, document validation, and real-time transaction updates. During the design phase, system specifications were translated into use case diagrams, entity-relationship models, and data flow diagrams to define user interactions, data structures, and system processes. The implementation phase involved developing system modules using PHP and Vue.js for the web-based application, with MySQL serving as the centralized database for storing property records, user credentials, and transaction data.

System testing was conducted following Agile sprint cycles, including unit testing, integration testing, and user acceptance testing to ensure functionality, security, and usability. Pilot testing with selected users and administrators was carried out to gather feedback and refine system features prior to full deployment, ensuring that eTitulo meets real-world real estate management requirements.

C. Participants and Locale

The study was conducted in **Surigao del Sur**, serving as the primary locale for the development and evaluation of the eTitulo system. The respondents consisted of **30 purposively selected participants**, including **10 IT experts, 10 licensed real estate agents or brokers, and 10 potential property buyers**. Purposive sampling was employed to ensure that only individuals directly involved in real estate transactions and system usage participated in the evaluation. This selection provided both technical and practical insights into the system's performance, usability, and effectiveness in managing property listings, reservations, and documentation.

D. Data Gathering and evaluation Tools

The study utilized survey questionnaires, interviews, and system evaluation checklists to assess the eTitulo system. The survey instrument was based on the ISO/IEC 25010 Software Quality Model, including functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability, and employed a five-point Likert scale where 1 = Not Acceptable and 5 = Acceptable. Interviews and system observations were conducted to gather qualitative feedback on usability, property listing, lot reservation, and documentation processes, ensuring a reliable evaluation of the system.

E. Data analysis Procedure

The data collected from the survey questionnaires were organized, tabulated, and analyzed using **descriptive statistical methods**. Responses were quantified using a **5-point Likert scale**, and the **weighted mean** was computed for each evaluation criterion based on the ISO/IEC 25010 Software Quality Model.

The computed mean values were then interpreted using the established **verbal interpretation scale** to determine the acceptability level of the system in terms of functionality, usability, performance efficiency, reliability, and portability. The results served as the basis for evaluating the overall performance and acceptability of the eTitulo system.

IV. RESULT AND DISCUSSION

The results of the system evaluation show that **eTitulo: A Smart Solution for Property Listing, Lot Reservation, and Documentation** achieved a **high level of acceptability** based on the ISO/IEC 25010 Software Quality Model. The



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computed weighted mean ratings indicate that respondents positively assessed the system in terms of **functional suitability, usability, performance efficiency, reliability, and portability**.

In terms of **functional suitability**, respondents agreed that the system effectively supports property listing, lot reservation, and documentation processes. The **usability** results indicate that the system is easy to navigate, user-friendly, and understandable for different types of users. For **performance efficiency**, the system demonstrated acceptable response time and stable operation during use. The evaluation of **reliability** shows that the system performs consistently with minimal errors, while **portability** results confirm that the system functions properly across different devices and web browsers.

Overall, the findings confirm that the eTitulo system meets user expectations and complies with international software quality standards, indicating that it is a reliable and effective solution for improving real estate management processes.

A. Sytem overview

The **eTitulo System** is a web-based real estate management platform designed to streamline **property listing, lot reservation, and documentation** processes. It provides a centralized system where clients can browse properties and reserve lots online, agents can manage listings and upload required documents, and administrators can verify users and approve property information.

The system follows a user-friendly design and supports secure data handling to ensure accuracy, transparency, and reliability. By digitizing traditionally manual real estate processes, eTitulo improves efficiency, reduces paperwork, and enhances the overall user experience for all stakeholders.

B. Evaluation Result

The evaluation results indicate that the eTitulo system achieved a high level of **acceptability** based on the ISO/IEC 25010 Software Quality Model. The computed weighted mean ratings show that respondents positively evaluated the system in terms of functional suitability, usability, performance efficiency, reliability, and portability.

Overall, the findings confirm that the system meets user requirements, performs efficiently, and is reliable across different platforms. These results demonstrate that eTitulo is an effective and acceptable solution for improving property listing, lot reservation, and documentation processes.

Table 2. Software Quality Evaluation of eTitulo

Table	Quality Characteristics	Mean	Verbal Interpretation
1	Functional Suitability	4.65	Acceptable (A)
2	Performance Efficiency	4.69	Acceptable (A)
4	Usability	4.54	Acceptable (A)
5	Reliability	4.68	Acceptable (A)
8	Portability	4.21	Acceptable (A)
Over-All Mean		4.55	Acceptable (A)

V. CONCLUSION

With the study findings and system evaluation, it was concluded that eTitulo has been able to solve major challenges in the real estate industry: fraud prevention, inaccurate data, and delayed documentation. Through its automated and verified processes, the system made sure that clients and agents, as well as administrators, have secured and transparent transactions. Its user-friendly interface, real-time updates, and account authentication features make property listing and reservation, as well as document handling, more reliable and efficient.



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