Perceptions of Realtors on Property Information Processing: Basis for a Web-Based Real Estate Property Management System

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Abstract: *Managing real estate properties efficiently presented challenges due to the complexity of tasks involved, including tenant communication, maintenance scheduling, and financial tracking. Traditional methods often relied on manual processes, leading to inefficiencies, errors, and delays. Motivated by the need for a streamlined solution, this paper introduced a web-based real estate property management system designed to address these challenges. By employing a descriptive research design and utilizing the mixed methodology approach, the study investigates the challenges faced by realtors in managing property information. It also evaluated the current information management systems of each realtor in handling property listing, sales, leases, and rentals. The research findings revealed that 45% of respondents encounter challenges in property information management, primarily related to inefficient handling of sales information and lease agreements. While 72.7% of respondents use real estate software, shortcomings such as a lack of detailed property information and communication issues underline the need for a comprehensive web-based management system meeting various real estate management needs, as preferred by 90.9% of respondents. The results of the study will be used to propose a web-based real estate property management system for the overall efficiency of real estate operations and revolutionize how real estate assets were managed and optimized in digital age.*

Keywords: Property Listing, Dashboard, Tenant Management, Lease Management, Maintenance Tracking, Financial Management, Document Management, Reporting & Analytics

I. INTRODUCTION

The current conventional property management practices, particularly in Surigao City in the Philippines, suffer from various issues such as manual data handling, lack of centralized systems, and limited accessibility, leading to inefficiencies and errors. These challenges create significant gaps in the management process, hindering effective decision-making and resource utilization. The research focuses on a specific locale, identifying localized needs and contextualizing solutions for enhanced relevance. With the escalating complexity of real estate operations, there arises a pressing need for a streamlined and integrated system that can automate tasks, optimize workflows, and provide comprehensive insights for informed decision-making.

This research exploration aims to address the existing shortcomings and enhance efficiency within the real estate industry by providing a comprehensive and user-friendly platform accessible through the web. The study is timely and relevant as it addresses the growing demand for efficient property management solutions in an increasingly digital world. By providing a platform that centralizes and automates key processes, the project offers a practical solution to existing challenges and aims to improve overall satisfaction and productivity within the real estate industry.

The primary beneficiaries of this study include real estate agencies, property owners, landlords, tenants, and maintenance staff. Real estate agencies and property owners will take advantage from improved management capabilities, efficient processes, and better decision-making through data-driven insights. Tenants will experience enhanced communication and service delivery, while maintenance staff will have access to organized work orders and schedules.

The proposed system will incorporate features such as property listings, tenant management, rent collection, maintenance tracking, and financial reporting. By leveraging technology, the project is expected to increase efficiency, accuracy, and transparency in property management operations. The proposed system also emphasizes the significance of software architecture, algorithms, and enterprise resource planning in facilitating seamless property management processes. The proposed automated system has the potential to contribute to the advancement of property management practices and may serve as a model for future developments in the field. The implications of this study extend beyond its immediate beneficiaries to the broader real estate industry, where increased efficiency and effectiveness in property management can lead to positive economic and social outcomes.Through this study, there is a desire to not only find a better way of managing real estate assets but also to pioneer improvements in the overall efficiency and effectiveness of property management systems.

II. OBJECTIVES OF THE STUDY

The study aims to achieve the following objectives:

- To investigate the challenges faced by realtors in managing property information.
- To evaluate the current information management systems of each realtor in handling property listings, sales, leases, and rentals.
- To propose an information management system for the overall efficiency of real estate operations.

III. RELATED LITERATURE

Forward-thinking real estate executives need to position their companies to take advantage of new growth prospects and optimize asset values as the economy improves and development picks up speed [1]. Through the Real Estate Management Program, people can learn how to assess land value and market demand, oversee projects involving vendors, suppliers, and capital sources, and guide your real estate company through times of market and industry upheaval.

In order to effectively compete in today's dynamic global marketplaces, real estate practitioners and industry professionals gather for the Real Estate Management Program, which explores best practices, real-world scenarios, and efficient management strategies [2]. Comprehensive tools for organizing, monitoring, and overseeing your real estate portfolio are available with real estate management [3][4]. The program can help make accurate and successful strategic decisions for both owned and leased assets. For simple leasing management, regulations and compliance standards are updated V.G. Ghyoot[5].

In Nigeria, the Real Estate and Property Limited is a stand-alone real estate firm that specializes in facility maintenance and focuses on property development, management, marketing, and sales of real estate goods and services. It is synonymous with creating cutting-edge, unmatched luxury homes, flats, and commercial spaces to cater to our expanding affluent audience [6]. Real estate and property limited has made a name for itself as the top facilities management company. The fact that they manage buildings occupied by some of the country's most discriminating clientele is proof of their excellent facilities management services. Property management and real estate are involved in a comprehensive management and tracking of leased and owned properties across an entire real estate portfolio. The company can also support for landlord and tenant lease types to allow tracking of expenses and income separately. It has automated tracking of costs and expenses by department, space, or payees that can create and track lease payments automatically and roll up information to each facility's cost worksheet or across your real estate portfolio. The system helps manage critical dates and allow Unifier to notify clients of upcoming lease dates that require your attention. It utilizesflexible workflows to route, review, and approve common real estate transactions such as site selection and acquisition, dispositions, new lease initiation, subleasing.

According to Amandeep et al. [1], the availability of new technological tools like data warehousing and datamining has made automated systems. Similarly, Thompson, H. [7] emphasize the Management Information Systems more relevant to the real estate and property management decision-making process in the current context of abundantly available data on electronic media at various locations and on diverse platforms. The MIS can be used to understand space management and lease administration data, efficiently manage the corporate real estate environment and keep lease charges under control, utilize a distinct, real-time graphical depiction of space qualities, utilization, and occupancy for

increased management capabilities. It can also optimize space utilization with streamlined space assigning, occupancy and vacancy tracking, and monitoring capabilities for each defined area. As mentioned by Barnett, G. et. Al [8], this helps to maintain a system-wide audit trail that records payments from the lease to the vouchering and check cutting, as well as from billings to invoices and payment, to ensure accounting and compliance with FAS 13/IAS 17.

The Property Matrix is a web-based solution that works well for properties with several families and apartment buildings. In addition to standard property management functions, the system offers comprehensive accounting and maintenance packages. For over 25 years, the software has been a well-known property management solution. According to Gupta [9], the system is web-based and focuses on managing HOAs and condos. It also provides accounting and portfolio management features. The Condo Manager is a software-as-a-service module that offers a comprehensive set of tools for database management, accounting, and import/export. Developed in 1989, Budgetary Real Estate Development and Property Management Accounting offers small to mid-size developers, fee managers, and property owners an on-premise or web-based property management system. The system provides strong stand-alone property accounting functionality. Meanwhile, the MRI Commercial Management eliminates human error from recovery calculations and square footage adjustments by providing automated calculations and billing. This system is highly adaptable and offers a depth of capability [8].

The Alexander, L.[2], investigated on real estate and property management software. The study adopted the descriptive method of percentages, mean and proportion method for analysis. The study found that the skill requirements for CREM were financial performance skill, investment in corporate strategy, productivity skill, space efficiency management skill and customers and employee's management skill. The results of the analysis also showed further that the portfolio efficiency skill was rated by the respondents as the least skill required for corporate real estate management. The study has major implications on real estate education and management in Nigeria.

Estate property management system mainly deals with geographical area with associated information for monitoring and managing estate properties. Geographic Information System (GIS) has potential to handle spatial data in a single platform which makes GIS a favourable choice for estate property management system. The research of Paul, A. et al. [11] proved that free and open-source GIS become affordable and popular in large number of applications. Hence there is a demand to develop a new or upgrade an existing non-GIS based system to a GIS based property management system.

IV. METHODOLOGY

4.1 Research Approach

The research approach to the study of a web-based real estate property management system can be characterized by its incorporation of both quantitative and qualitative methodologies, forming a mixed approach. Quantitative methods entail the collection and analysis of numerical data, such as respondents engagement metrics and transaction volumes, providing valuable insights into system performance and their behavior. Qualitative methods, on the other hand, focus on understanding the subjective experiences and perceptions of the realtors through techniques like interviews and surveys, offering nuanced perspectives on usability and satisfaction. By combining these approaches, researchers can achieve a comprehensive understanding of the system's functionality, user needs, and market dynamics, facilitating informed decision-making and optimizing the system's design and implementation.

4.2 Research Design

The research design for this study adopts a comprehensive approach, blending elements of both quantitative and qualitative methodologies. Initially, we conduct a thorough review of existing literature and market analysis to identify key features, user requirements, and technological trends. Following this, we employ a mixed-methods approach, integrating surveys, interviews, and exclusively gather insights from real estate agents. This qualitative data is complemented by quantitative analysis of user behavior, system performance metrics, and comparative studies with existing platforms.

4.3 Research Instrument

Various research instruments, including surveys, interviews, and system usability tests, are utilized to gather data pertaining to user experiences, system functionalities, and overall satisfaction levels.

The online survey questionnaire aims to gather comprehensive insights into user preferences and experiences with a web-based real estate property management system. The questionnaire covers various aspects such as user interface design, feature set, ease of navigation, data security measures, customer support effectiveness, and overall user experience. Also, it helps the study to identify areas for improvement and tailor the system to better meet the needs of real estate professionals.

The interview conducted with Filipino Homes real estate agencyexplores into the intricate workings and innovative features of web-based real estate property management system and to the current system they use. Designed to streamline every aspect of property management, from listings and tenant communication to financial tracking and maintenance scheduling, our platform stands at the forefront of modern property management solutions. It examines the system leverages cutting-edge technologies to provide intuitive user interfaces for both property managers and tenants, fostering seamless interaction and communication.

4.4 Participants and Sampling Method

The participants of this study primarily real estate agents, and individuals utilizing such systems in their professional capacities. Sampling techniques involve purposive sampling to ensure a diverse representation within the sample population.

4.5 Data Gathering Procedure

In order on this study to have an efficient and comprehensive web-based real estate property management system, an extensive data gathering procedure was implemented. Initially, a systematic approach was adopted to identify the key stakeholders. Surveys and interviews were conducted with stakeholders to understand their specific needs, preferences, and pain points in managing real estSate properties

4.6 Data Analysis

In the data analysis of the web-based real estate property management system, a comprehensive approach was taken to extract meaningful insights from the collected data. Initially, raw data streams from various sources such as respondents' interactions, property listings, financial transactions, and maintenance logs were compiled and organized for analysis. Statistical techniques like descriptive statistics, provide a summary of key metrics to analyze the perceptions of the respondents on the current real estate property management system in Surigao City. Table 1.0 presents the interpretation of the range of weighted mean, which is utilized to gauge the level of agreement among respondents on the challenges they faced in managing real estate property information.Table 1.0 presents the guide to determining the level of agreement among respondents on their preferences of theproposed system

Table 1.0 The Interpretation of Range of the Weighted Mean

Range of the Weighted Mean	Interpretation
4.51 – 5.00	Strongly Agree (for the questions asked)
3.51 – 4.50	Agree (for the questions asked)
2.51 – 3.50	Moderately Agree (for the questions asked)
1.51 – 2.50	Disagree (for the questions asked)
1.50 and below	Strongly Disagree (for the questions asked)

V. RESULTS AND DISCUSSION

This chapter probes into the analysis and interpretation of the data collected from participants' responses, elucidating on the overall efficacy of the web-based real estate property management system.

5.1 Profile of the Participants

The participants in this study encompass various real estate professionals, including their gender, position or role, the term of years in the industry, and the type of properties they are dealing with.

Table 2.0 Profile of the Respondents in terms of Gender

Gender	Frequency	Percentage %
Male	4	40 %
Female	6	60 %
Total	**10**	**100 %**

Table 2.0 presents the profile of the respondents according to gender. As can be seen in the table, there are 4 or 40% of the respondents are male while 6 or 60% are female. This implies that the majority of the real estate agents who participated in the survey are males.

Table 3.0 Profile of the Respondents in terms of Position/Role

Position	Frequency	Percentage %
Real Estate Agent	10	90.9 %
Property Manager	1	9.1 %
Total	**11**	**100%**

Table 3.0 shows the profile of the respondents according to position/role. There are 10 or 90.9% of the respondents are real estate agents while 1 or 9.1% are property managers. This implies that the majority who participated in the survey are real estate agents.

Table 4.0 Profile of the Respondents in terms of years in the real estate industry

Years	Frequency	Percentage %
Less than 1 year	8	72.7%
1-5 years	3	27.3%
6-10 years	0	0 %
More than 10 years	0	0 %
Total	**11**	**100 %**

The profile of the respondents according to the term of years they have been in the real estate industry is presented in Table 4.0. As can be gleaned in the table, there are 8 or 72.7% of the respondents are less than 1 year while 3 or 27.3% are 1-5 years, and none of the respondents beyond 6-10 years or more. This implies that the majority who participated in the survey are real Less than 1 year in the industry.

Table 5.0 Profile of the Respondents in terms of Type of Properties deal with

Type of Properties deals with	Frequency	Percentage %
Residential	10	90.9%
Commercial	1	9.1%
Industrial	0	0 %
Mixed-use	3	27.3 %
Total	**14**	**100 %**

Table 5.0 presents the profile of the respondents according to the type of properties they are dealing with. As can be seen in the table, there are 10 or 90.9% of the respondents are dealing with residential while 1 or 9.1% are dealing with commercial, and 27.3% dealing with mixed-use properties. This implies that the majority who participated in the survey are dealing with residential properties.

5.2 Challenges in Managing Property Information

Table 6.0 Respondents response on the challenges encountered in managing property information

Are there any other specific challenges you face in managing property information	Frequency	Percentage %
Yes	5	45 %
No	6	55 %
Total	**11**	**100 %**

The respondents were asked about the challenges that they have encountered when managing the real estate information. As can be seen in table 6.0 presents the profile of the respondents according to the challenges in managing property information. As can be seen in the table, there are 5 or 45% of the respondents who faced some challenges while 6 or 55% have none. This implies that the majority who participated in the survey are not dealing with challenges in managing information.

Table 7.0 Types of challenges you encountered in managing real estate property information.

Types of Challenges	Frequency	Percentage %	Rank
Inefficient handling sales information	6	24%	Rank 1
Challenges in managing lease agreements	6	24%	Rank 1
Limited centralization of property information	5	20%	Rank 2
Difficulty in tracking property listings	4	16%	Rank 3
Issues in tracking rental information	4	16%	Rank 3
Total	**25**	**100%**	

Table 7.0 presents the type of challenges that the respondents encountered in managing real estate property information. There are 6 responses compromising 24% of the response reveal the most common challenges which include inefficient handling of sales information and lease agreements and managing of lease agreements, 5 or 20% of the responses pertain to limited centralization of property information while, 4 responses or 16% in both difficulties in tracking property listings and Issues in tracking rental information. This implies that the majority who participated in the survey faced more challenges in both inefficient handling of sales information and challenges in managing lease agreements. This suggests that among those facing challenges, the primary issues revolve around inefficient handling of sales information and managing lease agreement.

5.3 Evaluation of Current Information Management Systems

Table 8.0 Current Information Management System or Tools Used by the Respondents in Managing Real Estate Property Information

Current Information Management System	Frequency	Percentage %
Spreadsheet software (e.g., Excel)	1	9.10%
Real estate software	8	72.70%
Customer Relationship Management (CRM) software	0	0.00%
Paper-based systems	4	36.40%
Others	0	0.00%
Total	**13**	**100.00%**

Table 8.0 presents the respondents answer according to the current system/tools they are using in managing real estate property information. As can be seen in the table, 9.1% of them are currently using Spreadsheets or Excel, followed by real estate software (8 or 72.7%), and 4% or 36.4% in paper-based systems. This implies that the majority who participated in the survey currently using real estate software.

Table 9.0 Respondents' Perception in Managing Real Estate Property Information

Statements	Weighted Mean	Description
The unavailability of detailed and accessible property information can affect transparency in property management.	2.73	Moderately Agree
The lack of clear communication between property managers and stakeholders could significantly impact the overall transparency in managing property information.	2.91	Moderately Agree
Inconsistent communication channels and a lack of standardized	2.82	Moderately Agree

processes contribute to inconvenience in real estate property management operations.		
The absence of a robust emergency response system can cause delays and inconvenience in addressing urgent issues.	2.82	Moderately Agree
Inadequate security measures within property management systems raise concerns about the security and confidentiality of sensitive information	2.82	Moderately Agree
The lack of centralized and organized information poses challenges in accessing and retrieving critical data for effective real estate property.	2.91	Moderately Agree
The lack of current information management system can affect the efficiency of handling property information.	2.91	Moderately Agree
The lack of real-time data updates and synchronization across property management platforms hinders the efficiency of day-to-day operations in real estate management.	2.73	Moderately Agree
Average Weighted Mean	2.83	Moderately Agree

The table 9.0 shows that the respondents were mostly moderately agree on the statements about managing real estate property information. The weighted mean for all the statements is close to 3. Based on the findings, it can be deduced that the respondents moderately agreed on the statement "The unavailability of detailed and accessible property information can affect transparency in property management" (weighted mean = 2.73).The respondents were slightly more concerned about the lack of clear communication between property managers and stakeholders (weighted mean = 2.91) and the lack of a centralized and organized information system (weighted mean = 2.91). Overall, the table suggests that there is room for improvement in the way that real estate property information is managed. The respondents would like to see more detailed and accessible information, as well as clearer communication between property managers and stakeholders. They would also like to see a more centralized and organized system for storing and retrieving property information.

5.4 Proposed Web-Based Real Estate Property Management System

Table 10.0 Web-based Real Estate Property Management System

Would you prefer a web-based or on-premise information management system?	Frequency	Percentage %
Yes	10	90.9%
No	1	9.10%
Total	**11**	**100%**

The respondents were asked on their perception on their preference of information management system. As can be seen in the table 10.0, 90.9% said yes, and 1 or 9.1% said no. This implies that the majority who participated in the survey prefer to use web-based in managing the property information.

Table 11.0 Key features of the Proposed Web-based Real Estate Property Management System

Key Features Key Features of the Proposed Web-based Real Estate Property Management System	Frequency	Percentage %	Rank
Property Management and Monitoring	10	90.90%	1
Property Listing	9	81.80%	2

Generation of Reports, like schedules of payments and sales summaries	8	72.70%	3
Property Rental and Sales	7	63.60%	4
Recording of Payments and Other Charges	6	54.50%	5
Agents and Agency Profiles	5	45.50%	6
Total	**45**	**100%**	

Table 11.0 presents the respondents' preferences on the ideal features of a web-based real estate property management system. Majority of them, 9 or 81.8%, prefer to have an ideal to have a property listing, 5 or 45.5% in property rental and sales, 7 or 63.6% in property rental and sales, 6 or 54.5% in recording to payment and other changes, 8 or 72.7% in the generation of reports, and 10 or .90.9% in property management and monitoring. This implies that the respondents want the system to encompass a wide range of features reflecting a strong preference for a comprehensive and versatile web-based real estate property management system.

5.4.1 Conceptual Framework of the Proposed System

The conceptual framework, presented in Figure 1.0, outlines a web-based system designed to streamline property management for realtors and tenant. The figure shows the independent variable is the proposed web-based real estate property management system.

There are three factors that influence how a realtor or property manager uses this system:

Transparency: This refers to how clear and easy to understand the information in the system is. If the information is presented well, it will be easier for the realtor or property manager to use the system.

Convenience: This refers to how easy it is to use the system. If the system is convenient to use, the realtor or property manager will be more likely to use it.

Efficiency: This refers to how well the system helps the realtor or property manager to complete tasks. If the system is efficient, it will save the realtor or property manager time and effort.

The cofounding variable is property features and information, prior system that is used in managing properties. This refers to the characteristics of the property and any other information that is relevant to managing it. The system may need to be adapted to consider these factors.

The mediating variable is the resilience of the realtor and property manager in managing the property. This refers to the ability of the realtor or property manager to cope with challenges and setbacks. Even if the system is easy to use, there will still be some problems that come up. A resilient realtor or property manager will be better able to deal with these problems.

The moderating variable is system's acceptance. This refers to how well the realtor or property manager accepts the new system. If they are resistant to change, they may be less likely to use the system effectively.

The dependent variable is the proposed system. This refers to the outcome that is being measured. In this case, the outcome is how well the realtor or property manager manages the property. The diagram suggests that the use of a web-based real estate property management system will improve the way that realtors and property managers manage properties, but this will depend on the factors discussed above.
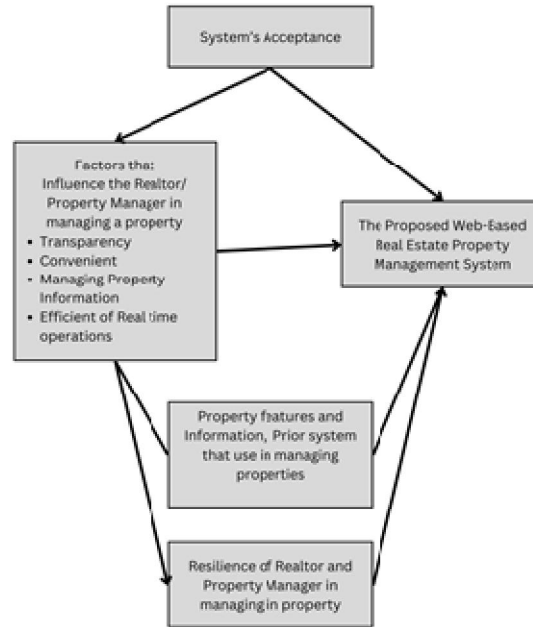
Figure 1.0 Conceptual Framework of the Study

5.4.2 System Development Process of the Proposed Web-based Real Estate Property Management System
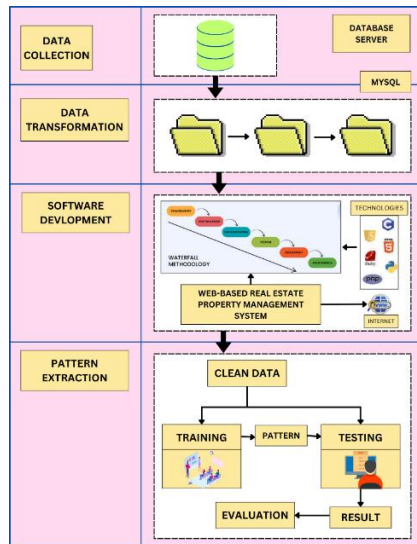

Figure 2.0 The Development Architecture of the Proposed System

The development process of the proposed web-based real estate property management system is visually articulated in Figure 2.0, offering a comprehensive depiction of the step-by-step process employed in Knowledge Discovery in Databases (KDD) to extract meaningful patterns from the existing database. This development architecture design is intricately structured and encompasses four key stages, each playing a pivotal role in the overall success of the system. These stages are data collection, data transformation, software development, and pattern extraction.

VI. CONCLUSIONS AND RECOMMENDATIONS

The proposed information management system survey results indicate a strong preference among respondents for web-based applications in managing property information. The findings highlight a consensus among participants for a versatile and inclusive system capable of addressing various aspects of real estate management. The adoption of web-based real estate property management systems represents a significant advancement in the field, offering benefits such as streamlined processes, enhanced communication, and data-driven decision-making. These systems align with broader trends towards digitalization and innovation in real estate and hold the potential to drive efficiency and value creation across the industry. Investing in their development and adoption is crucial for staying competitive and meeting evolving customer expectations. This research underscores the importance of understanding the transformative potential of these systems and their role in shaping the future of real estate management.

Exploring future investigation opportunities, the web-based real estate property management system can evolve into a comprehensive and innovative platform, empowering users with actionable insights and enhanced efficiency in property management operations. The introduction of robust data analytics tools to provide valuable insights into property performance, tenant behavior, and market trends. It will enable users to make informed decisions by incorporating actionable analytics such as occupancy rates, rent trends, and maintenance cost. Fostering collaboration among property management teams, tenants, and stakeholders by introducing communication and collaboration tools within the platform. Enable seamless sharing of documents, messages, and updates to enhance transparency and efficiency in property management operations.

VII. AKNOWLEDGEMENT

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