

Integrating Emerging Technologies in Real Property Management Practice in Osogbo, Nigeria

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Abstract

As a critical component of the national economies, the need for an efficient and effective property management cannot be overemphasized. The real estate sector which property management is part of, has significantly contributed and still contributing to the national growth in terms of employment, economic growth and investment development. The current global transformational changes in the sector due to the evolving technologies has further exposes the need for the integration and the likely potentials of the emerging technologies to revolutionizes the country's real estate sub-sector that could engender transparency, and operational efficiency leading to customer satisfaction and national growth. Hence, this study investigates the perceptions of property managers on the readiness of the sub-sector to embrace PropTech and propose strategies for its successful integration in Osogbo property market, Osun state, Nigeria. As a perceptual study, inferences were drawn from both the existing literatures and the perceptions of the respondents. It highlights the transformative impact of PropTech on property management practices and its applicability in the state. Findings revealed its nascent adoption in the state with significant challenges around lack of expertise, infrastructural deficits, high implementation costs among others. The research concluded that despite these barriers, opportunities exist in the form of government initiatives, and the unabated national urbanization rate. It underscores the need for collaborative efforts among stakeholders to foster a technology-driven real estate sector that enhances service delivery and promotes sustainable growth.

Keywords: Emerging Technologies, Real Property Management Practice, PropTech, Osun state, Nigeria.

Introduction

The current rapid global evolution of technology has reshaped and redefined the various industrial landscapes, for which property management, a subset of the real estate practice is not left out. Specifically, the emergence of innovative technology as property technology (PropTech) is a major break-through. Apart from the revolutionization of the global real estate transactions

and the redefinition of the conventional real property ownership and management paradigm, Baum (2017) asserted that PropTech represents the convergence of technology with real estate practices to enhance efficiency, transparency, and sustainability in managing real property assets. PropTech, as an emerging technology embraces such wider technological coverage as artificial intelligence (AI), Internet of Things (IoT) devices, cloud-based platforms and blockchain which are all technological revolutionary leverage tools. These tools have transformed the global real estate transactions, be it around assets valuation, development, management, appraisal, maintenance and marketing. The application of Big Data, Augmented Reality (AR) and Virtual Reality (VR) in addressing challenges associated with the obsolete real property management practices have taken the real estate industry to another realm.

Despite the promising potential of modern technologies, Ankeli (2024) argued that the adoption and application or integration of these technologies in the real estate subsector in developing nations, particularly in Nigeria, is nascent and remain uneven. Both Ankeli (2024) and Adegbile et al., (2020) outlined the significant contribution of the real estate subsector to the national economic growth but were quick to submit that these contributions were plaque by gross inefficiencies. The inefficiencies that often results in property management incompetency usually emanate from corrupt tendencies or lack of transparency, cumbersome administrative/bureaucratic bottleneck, poor infrastructure provisions, and land ownership disputes. Osun is one of the states in south-west Nigeria, that is exhibiting alarming urban population growth rate, dominant informal real estate practices, limited technological adoptions, with increasing demand for efficient property management systems; hence, represent provocative case for exploration of the integration of PropTech in real property management. Ankeli (2024) opined that Osun state, particularly the cities of Ile Ife, Ede, Ilesha and Osogbo stands at a crossroads where the conventional real estate practices intersect with contemporary technological innovations. The current paper, therefore, assesses the perceptions of property managers on the integration of PropTech in real property management practices in Osogbo, the capital city of Osun state, Nigeria. To achieve the aim of the study, the paper examines the current state of adoption and applications, the influencing factors/barriers hindering its adoption and usage, and

the potential impact of these technologies on the efficiency and transparency of property management processes.

The conduct of the research is considered timely and justifiable due to its ability to expose the potentials of the emerging technologies in bridging the knowledge gap between conventional and contemporary property management approaches through technology-driven solutions. By focusing on Osogbo, the capital of Osun State, the study further provides localized insights into the available opportunities and challenges of PropTech integration in a developing economy. The findings will not only inform stakeholders in the real estate subsector but also contribute to the broader discourse on the role of technology in enhancing real estate practices in Nigeria and beyond.

Literature Review

The current gradual but consistent global industrial revolutionization as extended to the real estate subsector, which has become a focal point for enhanced growth, transparency, and efficiency, is linked to the integration of the emerging contemporary technologies. Scholars in the developed nations have made concerted efforts on determination of the level of adoptions, application and challenges faced in the integration of emerging technologies in the real estate practice and how to overcome it. However, little effort has been made in developing economies, particularly in regions like Osun State (Nigeria), where property management practice is at the crossroads between conventional and contemporary techniques. Hence, there is a need to conduct clear-cut research that will comprehensively assess the perceptions of property managers on their readiness to embrace emerging technologies, particularly PropTech, in the property management practice.

Braesemann and Baum (2020) attempted to determine the effect of PropTech in the reshaping of real estate industry into a data-driven market using data from over 7,000 PropTech firms. Findings from the study concretized the general notion that the high-income nations are the forebearers of the transformation initiatives of the real estate practice into a data-driven market through PropTech solutions. Philips (2019) asserted that the real estate subsector contributed approximately 17 – 20% to the global Gross Domestic Product (GDP) with PropTech alone investing about \$14 billion in the first half of 2019. Baum (2017) thus submitted that emerging

leading PropTech firms as Digital Realty, Equinix, Property Guru, Zoopla, Nestpick, and Property finder are already engaging online real estate services to promote eco-friendly living and sustainable energy conservation. The need for green and sustainable real estate practices through innovative technology integration as drone technology, blockchain and Internet of Things (IoT) was emphasized by Feth and Gruneberg (2018). These devices according to Chen et al., (2022) are being deployed to monitor building systems, reduce energy consumption, and enhance safety in smart buildings.

Furthermore, Aihie (2019), in his examination of the challenges of PropTech trend in the Nigerian real estate industry, underscores the need for the integration of the Nigerian real estate practitioners into the emerging technological revolution to remain afloat and competitive. This became more desirous with the outbreak of COVID-19 in the country which put the non-sustainable conventional real estate operations at a serious risk of becoming obsolete. In the analysis of the impact of COVID-19 pandemic on tenancy agreements in Nigeria, Ankeli et al (2021) concluded that the pandemic has a profound impact on property management practices. The study accentuated the decision to curtail mobility through lockdown policy and social distancing aiming at flattening the pandemic curve ignited the need for the entrenchment or embracement of new innovative technologies or the “new order” in the Nigeria real estate subsector, thereby accelerated the adoption of the contemporary technologies. Similarly, Oyetunji et al. (2018) examined the specific hindrances posing challenges to the successful adoption of information and communication technology (ICT) by real estate practitioners in the city of Lagos, Nigeria. The study suggested the need for the development of specialized software that will be in line with global best practices aimed at enhancing effective and efficient real estate practices in the country. Oluwatofunmi et al., (2021) opined that online residential brokerage, innovative city applications and increased space utilization are some of the basic trending innovative technologies used in real estate practice in Edo state, Nigeria. Akeju et al., (2021) further underscored the importance of mobile technology usage among real estate firms in Lagos state, Nigeria and other African nations. The study highlighted the potential negative consequences of the low rate of adoption on future real estate service delivery in the state. Though to curb the likely negative consequences and improve the development of a sustainable

online real estate management practice in the country, Obinna and Udo (2022) have suggested the need for the incorporation of more data through enhanced features that will guarantee efficiency, affordability, sustainability and adaptability in the industry. However, Ankeli (2024), Olapede and Olaleye (2019), and Adebisi et al. (2019) observed that, despite the potential of emerging technologies in real property management practices in Africa and Nigeria in particular, its adoption and applications are hampered with challenges. Prominently among these challenges as outlined by the scholars are the lack of technical expertise and skill gap, infrastructure deficit, high cost of implementation, lack of awareness, dearth of property data and data monopoly. Thus, the need to evaluate the divergent opinions among scholars and property managers on the factors impeding the full acceptance and adoption of PropTech in real property management practice in Nigeria despite its potentials cannot be overemphasized.

It has therefore become a consensus among real estate professionals that the integration of PropTech technologies as estate FinTech, Smart Real Estate among others will engender more productivity and offers solutions that will adequately address issues relating to the regional and global real estate dynamics. This study therefore evaluates the perceptions of property managers on PropTech adoption and application in Osogbo for quality service delivery, customer satisfaction, and the overall competitiveness.

Therefore, the philosophical underpinning of this study is the Rogers (1995) Diffusion of Innovation (DOI) Theory which explains how technological innovations spread in organizations through factors as compatibility, relative advantage, trialability, complexity, and observability influences.

Methodology

The study adopted mixed method research approach as both quantitative and qualitative approaches were employed in its data gathering. Samples used for the study were drawn from the firms of registered Estate Surveyors and Valuers (ESV) from where relevant data were gathered through interviews and questionnaires administration. The study randomly picked 32 firms out of the 43-estate surveying and valuation firms currently practicing in Osogbo. This figure constituted 74% of the practicing firms in the study area. This is therefore considered adequate and a good representation of the total firms. Osogbo, the capital of Osun State is the focus of this

study as over 65% of real estate business transactions in Osun State takes place in this city, hence; one of the most vibrant real estate business cities in Osun State, Nigeria. To ensure good representation, reliability, consistency of data collection procedures, and the adequacy/comprehensiveness of the professional opinions of the respondents, two staff (the principal partner and the most senior surveyor) in each of the selected firms were picked for interview and questionnaire administration.

The rationale for selecting these sets of respondents' rests on the fact that valuable data can be obtained from these individuals who hold critical positions within their respective establishments, with valuable industry-specific insights acquired over time through experiences in real estate practice dynamics. Furthermore, the real estate firms purposefully selected for the study are firms with minimum of five years professional practice background in real estate surveying and valuation operations. The reason for fixing years of experience as criteria for picking practicing firms is to ensure the inclusion of real estate firms with substantial professional experience, expertise, and proven track records in the field. It is therefore believed that this study will positively contribute to the ongoing debate in cyberculture with a better understanding of the need to integrate emerging technologies into the real estate industry.

Data Presentation and Discussions

Questionnaires were administered to sixty-four (64) respondents, comprising 32 principal partners and 32 senior surveyors. However, only 54 of the 64 administered questionnaires were correctly filled and returned for analysis, representing an 84% response rate. This is within manageable size, hence; considered adequate. The breakdown of how the questionnaires were administered, retrieved and the percentage rates is presented in Table 1.

Table 1: Analysis of Questionnaire Administration.

Status in Firm	Frequency Administered	Number Retrieved	Percentage Rate
Principal partner	32	29	91%
Senior Surveyor	32	25	78%
Total	64	54	84%

Source: Field Survey, 2025

Table 2 revealed the variations in level of the selected estate firms' years of experiences in real estate surveying and valuation operations in the study area. The Table shows that 70% of the selected real estate firms have between 11 – 20 years of experience in real estate surveying and valuation practice in the study area. This has enriched the quality of the data collected and used for the study. While 15% of the firms have below 11 years of experience. This implies that the data collected are robust and from the right sources as they are from respondents who are in the right position to provide answers to the issues at hand; hence, it engenders the validity and reliability of the outcome from the processed data.

Table 2: Estate Surveyors' Years of Experience in Real Estate Practice in Osogbo

Experience	Frequency	Percentage
5 - 10 years	5	15%
11-15 years	12	38%
16-20 years	10	32%
Over 21 years	5	15%
Total	32	100%

Source: Field Survey, 2025

Perceptions of Estate Surveyors and Valuers on the challenges faced in the adoption of PropTech in the Study Area.

Several factors have been adduced by earlier scholars as factors posing barriers to the adoption and application of PropTech in real estate firms. Among these factors as postulated by Ankeli (2024), Oluwatofunmi (2021) and Oyetunji (2018) are inadequate infrastructural facilities, legal complexities/ineffective regulatory framework, lack of technical expertise, limited access to finance, high cost of implementation and lack of adequate awareness. This study, therefore isolated the aforementioned factors, subjected them to test to get the perceptions of the professionals in Osogbo with respect to the challenges of PropTech adoption and application challenges in the study area using Relative Agreement Index (RAI).

The study tested the psychometric proficiency of the respondents on factors constituting barrier to the adoption and application of PropTech in the study area. Six of the factors identified from previous literatures were isolated and presented to the respondents. Their perceptions are presented in Table 3. It could be deduced from Table 3 that, high cost of implementation with RAI of 0.989 is the most impactful factor ranking first followed by the lack of adequate awareness and technical expertise with RAI of 0.978 each ranking second most impactful

factors. It is therefore evident that the isolated factors are all impactful factors that have the potentials of negatively influencing or hinders the adoption and application of PropTech driven tools in property management practice in the study area.

Table 3: Perceived Factors Impeding the Adoption and Application of PropTech in the study Area

Factors	Strongly Agreed (5)	Agreed (4)	Undecided (3)	Strongly Disagreed (2)	Disagreed (1)	Σ	RII	Rank
Inadequate infrastructural facilities	40 (74)	10 (19)	0	0	4 (7)	244	0.904	5 th
Legal complexities / ineffective regulatory framework	15(28)	15(28)	10(19)	14(26)	2(4)	195	0.722	6 th
Lack of technical expertise and skill gap	50(93)	4(7)	0	0	0	264	0.978	2 nd
Limited access to finance,	48(89)	0	2(4)	4(7)	0	254	0.941	4 th
High cost of implementation	53(98)	0	0	1(2)	0	267	0.989	1 st
Awareness problem	50(93)	4(7)	0	0	0	264	.978	2 nd

Source: Field Survey, 2025

Degree of PropTech Solutions Adoption and Application in Property Management Operations in Osogbo.

Table 4 revealed the degree of PropTech adoption and application in property management operations by real estate firms in Osogbo Metropolis. The application of PropTech solution in property management operations is to assist in transactions in areas as renting, buying, selling and other property management operations. The PropTech solutions tools often used for these transactions are among other - Virtual Reality (VR), Artificial Intelligence (AI), Augmented Reality (AR), FinTech, Drone and the Internet of Things (IoT). Table 4 shows that substantial number (64.8%) of the real estate firms practicing in the study area are using the conventional real property management procedures in their property management operations. However, 1.8%

of the firms indicated full adoption with 6.48 degree of application. This suggested that a significant number of real estate firms in the study area are yet to fully integrate PropTech solutions in their real property management operations which further indicated the level of backwardness in property management practice operations in the study area. However, about 27.8% and 5.6% of the responding firms reported partly and Moderately adoption and application of these PropTech solutions respectively.

Table 4: Degree of PropTech Adoption and Application in Real Estate Firm Operations.

Level of Adoption and Application	Frequency	Percentage	Degree of Adoption and Application
Not at all	35	64.8%	233.28
Partly	15	27.8%	100.08
Moderately	3	5.6%	20.16
Fully	1	1.8%	6.48
Total	54	100%	360

Source: Field Survey, 2023.

Perceived Reasons for PropTech Solutions Adoption and Application in Property Management Operations

The responses of the survey conducted shows the perceptions of the respondents on the reasons for the adoption and applications of PropTech solutions in the Nigerian property management firms. Five factors identified in previous literature was isolated and presented to the respondents, these factors were all agreed to be important though with some level of variances. The factor considered to be the most important is redefine property management operations with Relative Importance Index (RII) of 0.967, ranking 1st among all the other factors. This indicate that respondents recognize the potential of property technology in the rationalization processes, optimization of resource allocation and reduction in physical efforts through modernization. Improving operational efficiency (0.963) was considered the second most important and notable factor inspiring PropTech adoption and application. This finding suggests the need for firms to prioritize the integration of the emerging technologies in property management operations. The gaining of competitive edge ranked 3rd with an RII of 0.930. The leveraging of property management firms on PropTech solutions that could automate such task as tenant interactions, property maintenance and management among other agency task could reduce the firm overhead

cost, engender efficiency leading to improved client service satisfaction and engagement. This is congruent with the submission of Nguyen et al., (2023) and Mehta & Kamat, (2021) that artificial intelligence powered tools have transformed real estate decision making process through the provision of predictive analytics for marketing trends, property valuation and customer behaviour as well as the growing prominence of Augmented Reality (AR) and Virtual Reality (VR) in real estate marketing, allow prospective purchasers to remotely explore properties, thereby cutting-off physical visitations, save time and reducing costs.

Table 5: Perceived Reasons for PropTech Solutions Adoption and Application in Property Management Operations.

Factors/Reasons	Extremely Important (5)	Very Important (4)	Moderately Important (3)	Slightly Important (2)	Not Important (1)	Σ	RII	Rank
Improving operational efficiency	40[74]	15[28]	0	0	0	260	.963	2 nd
Refining customer experience	30[56]	20[37]	2[3.7]	2[3.7]	0	230	.852	5 th
Redefine property management operations	45[83]	9[17]	0	0	0	261	.967	1 st
Enhancing transparency in property practice	28[52]	22[41]	0	4[7]	0	236	.874	4 th
Gaining competitive edge	a 35[65]	19[35]	0	0	0	251	.930	3 rd

Source: Field Survey, 2025

Importance Level of Readiness for PropTech Adoption and Application in the study area

The cognitive proficiencies of the respondents were subjected to test through their perceptions of the importance of implementing PropTech solutions in property management in the study area. The study revealed variances in the importance attached to the level of their preparedness to

adopt and apply PropTech solution in property management operations in the study area. Substantial number of the respondents (90.7%) are of the opinion that PropTech solution in property management is extremely important; hence, are ready for its adoption and application, while the remaining (9.3%) are of the view that it is very important. However, none of the respondents considered PropTech solution in real property management in the study area to be less important or not important as there was complete absence of data to denote not important at all or slightly important. Hence, one can infer from Table 6 that the respondents recognize and appreciate the need for PropTech integration in property management and if given the enabling environment and support, are willing and ready to key in.

Table 6: Level of Readiness for PropTech Adoption and Application in the study area

Importance Readiness	Level	of Frequency	Percentage
Not Important at all		0	0
Slightly Important		0	0
Moderately Important		0	0
Very Important		5	9.3%
Extremely important		49	90.7%
Total		54	100%

Source: Field Survey, 2025.

Strategies for Sustainable PropTech Solution Adoption and Application in the Study Area.

Table 7 presents factors that could be employed as strategies that could enhanced sustainable adoption and application of PropTech solution in property management in Osogbo. Responses obtained from the field indicate that enhanced infrastructure and human capital development (27.7%), financial incentives or support (18.5) and industrial collaborations and partnerships (18.5) will play a considerable role in the integration of a sustainable PropTech solution in property management operations in Osogbo property market if employed.

Table 7: Strategies for a sustainable PropTech Solution Adoption and Application.

Factors	Frequency	Percentage
Enhanced infrastructure and human capital development in the area	15	27.7%
Changing customer expectations	5	9.3%
Effective and supportive regulative framework for PropTech innovation	7	13%
Industrial collaborations and partnerships in PropTech innovations	10	18.5%
Financial incentives or support	10	18.5%
Enlightenment on the benefit of PropTech adoption and application	7	13%
Total	54	100%

Source: Field Survey, 2023.

Conclusion

The conduct of research on the integration of emerging technologies in real property management practice with specific focus on PropTech integration is considered timely and justified. The research conducted provides substantial insights into the currently adopted property management approach, the level of adoption and acceptance of the contemporary methods using PropTech solutions. Findings revealed that, despite the potentials and opportunities of the emerging technological solutions, its adoption and application in Osogbo is still at its nascent stage with significant challenges in technological backwardness (lack of expertise), infrastructure deficits, high cost of implementation. These barriers according to the respondents can be overcome through technological advancement, supportive financial incentives, adequate awareness/sensitization campaign on the benefits of PropTech solution, enhanced infrastructure and human capital development among others. However, despite the challenges of the integration of PropTech solution, the study found that, all the respondents agreed to the need for the integration of PropTech solutions in property management practice, as opportunities exist in the form of government initiatives and the unabated national urbanization rate. To fully explore the benefits of PropTech solutions in property management, there is the need for a holistic approach that will require collaborative efforts among stakeholders to foster technology-driven property management practice that enhances service delivery and promotes sustainable growth.

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