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ACCEPTABILITY OF PROPERTY TECHNOLOGY (PROPTECH) ON PROPERTY MANAGEMENT PRACTICE IN CROSS RIVER STATE, NIGERIA

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Abstract

This study examined the acceptability of Property Technology (PropTech) in property management practice within Calabar Metropolis, Cross River State, focusing on residential and commercial properties. The study adopted a descriptive survey design and purposive sampling technique, targeting a population of 22 experienced property professionals. Data was collected through administration of structured questionnaire and interviews and analyzed using Multiple Regression Analysis. The findings revealed a significant effect of PropTech on traditional property management practice. The study found widespread awareness of PropTech innovations with digital platforms and industry events being the main sources of knowledge. Cost, cultural adaptation, and technical skills were identified as key factors influencing adoption while PropTech solutions were generally more effective than traditional methods. Online platforms dominated adoption with advanced tools showing moderate but growing use. Based on these findings, the study recommends targeted training programs, financial support and incentives, peer-to-peer knowledge sharing, public awareness campaigns and the institutionalization of PropTech education within professional certification programs to facilitate sustainable and inclusive integration. These measures aimed to overcome barriers such as cost and limited knowledge and promote the effective use of PropTech to enhance property management performance in Calabar Metropolis.

Keywords: PropTech, Residential Property, Commercial Property, Acceptability, Management

1.0 Introduction

The advent of Property Technology (PropTech) and the broader technological wave of the last decade has compelled traditional real estate sector players to reassess and realign their organizational structures to match emerging business models. Innovation fundamentally alters almost every aspect of an industry, transforming its structures and operational models. The real estate sector is no exception, undergoing a significant transformation that disrupts traditional, often slow, illiquid, and opaque practices. This rapid development in the use of innovative technologies is reshaping the sector. PropTech innovations have introduced new activities and models that hold the potential to disrupt and disintermediate the traditional real estate sector, which has long been characterized by inefficiencies and resistance to change. Scholars perceive PropTech as a formidable challenge to the traditional real estate industry, with the capacity to significantly alter the operations of established players. This disruption can be analyzed through the lens of the disruptive innovations theory, which provides a framework for evaluating the extent of transformation in the real estate sector due to the adoption of new technologies, mirroring changes observed in numerous other industries.

Although PropTech offers considerable opportunities for transforming real estate practice, its level of acceptance among estate surveyors and valuers in Calabar Metropolis remains relatively low. While major urban centres such as Lagos, Abuja, Port Harcourt, and Ibadan have increasingly integrated PropTech into their operations, many practitioners in Calabar continue to depend largely on conventional property management approaches. There is evident resistance toward accepting and fully utilizing emerging technologies within Calabar Metropolis. Property managers in Calabar Metropolis perform numerous responsibilities, including tenant screening, rent collection, property upkeep, supervision of repairs and maintenance, resolution of tenant complaints, compliance with regulatory requirements, financial and budget management, record keeping, and negotiation of lease agreements and renewals. Their overarching goal to maximize property value and generate profit for property owners, can be effectively and seamlessly handled by accepting property technology. Unfortunately, the PropTech revolution remains relatively novel among estate surveyors and valuers in Calabar Metropolis.

Unfortunately, the real estate industry in many undeveloped countries lags in embracing technology. Professionals often rely on conventional methods marked by paperwork, intricate administrative procedures, and fragmented communication channels. This reveals that the integration of modern technology in property management is crucial for optimizing investment returns and enhancing operational efficiency. As industry continues to evolve, the adoption of digital tools and innovative strategies will be essential in overcoming existing challenges and ensuring sustainable growth. DeBacker (2020) echoed this sentiment, emphasizing that the real estate industry's slow embrace of new methods contrasts starkly with the rapid technological integration seen in the automotive and financial sectors. Haider and Moranis (2021) also highlighted that the demand for innovation in real estate has been met primarily by tech entrepreneurs outside the sector, rather than from within. DeBacker (2020) further underscored

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that property management remains one of the last bastions within the sector to embrace technological change. However, the real estate sector is now on a transformative path, driven by shifts in market dynamics and technological advancements. This evolution is largely due to changing market demands and the influence of various technological periods that have altered consumer habits. These developments have culminated in the emergence of Property Technology (PropTech). PropTech has become an integral part of real estate practice, particularly in advanced economies such as the United States, United Kingdom, Germany, Spain, Finland, United Arab Emirates, Singapore, and China. In these countries, digital property listing, management and sales platforms such as Rightmove, Zillow etc. have transformed property sector by providing real-time data, virtual tours, automated valuations models (AVMs), and online transaction capabilities.

In Nigeria, PropTech acceptability is more pronounced in major metropolitan cities such as Lagos, Abuja and Port Harcourt. Digital property market places such as PropertyPro, CoManager property management software etc. have embraced the paradigm shift in technology. These platforms have improved property visibility, reduced information asymmetry and enhanced market transparency as well as improved property management practice (Aina, 2023). Property Technology (PropTech) offers significant potential for improving real estate practice, its acceptability among estate surveyors and valuers in Calabar Metropolis remains low. In contrast to other metropolitan cities, practitioners in Calabar Metropolis largely depend on conventional property management methods and show limited willingness to accept new technologies. Property managers undertake numerous responsibilities, including tenant selection, rent collection, property maintenance, financial administration, regulatory compliance, and lease negotiations, with the primary objective of maximizing property value and returns. While these activities can be efficiently managed through PropTech, its application remains relatively low within Calabar Metropolis. It is against this backdrop, that this paper therefore, examines the acceptability of PropTech on property management practices in Cross River State. By delving into this subject, the paper seeks to explore how PropTech can be integrated to enhance efficiency, accuracy, and overall performance in property management, thereby addressing the existing gaps and challenges faced by professionals in the region.

2.0 Literature Review

2.1 Overview of Property Technology (PropTech)

The term PropTech short form of "Property Technology" encompasses a broad range of technologies that are transforming various facets of the real estate industry. This includes sectors such as real estate investment, brokerage, design, planning, construction, and property management. PropTech can refer to an array of tools, from software and hardware to innovative materials and manufacturing processes (Donati, 2018). The fundamental idea is the application of technology to streamline and revolutionize the real estate sector, leveraging advancements such as property management software, automated systems, and data analytics. Baum and Dearsley (2022) describe PropTech as a subset of the broader digital transformation in the property industry,

emphasizing its role in fostering a mentality shift towards technology-driven innovation in data collection, transactions, and urban design. They trace the roots of PropTech to three significant movements: FinTech, Smart Building Technologies and the Shared Economy. Nakache and Lin (2019) observed that early PropTech innovations included database systems and online property listing platforms. However, contemporary property investors are now reimagining these systems, embracing more expansive and transformative approaches. This shift is evidenced by substantial investments from venture capital firms and real estate companies, which have poured approximately $9.6 billion into PropTech, fueling new innovations (CREtech, 2019).

Siniak, Kauko, Shavrov and Marina (2020) viewed PropTech as a new frontier in real estate, attracting global technology entrepreneurs and investors. These stakeholders are driving business model and product innovation, thereby elevating operational efficiency, customer engagement, innovation, and workforce productivity within the sector. The impact of PropTech extends beyond the real estate and built environment to the labour market, presenting a complex landscape. On one hand, there is the potential for worker displacement and the risk of monopolistic practices leading to unfair treatment. On the other hand, PropTech introduces new, flexible ways of working, learning, and skill matching. This dynamic underscores the dual-edged nature of PropTech's influence on the labour market, balancing the challenges of workforce displacement with the opportunities for new, skilled employment avenues. Thus, at the same time two opposite trends emerge: one, harm caused by movement of unskilled labour force (possibly together with over-abundant skilled labour force), from low-income countries towards high-income countries, where their arrival, in the absence of strong unions, will lead to a race towards bottom in the local labour market; two, for those who are in the market for high level technology and management oriented roles, a convenient fit between demand and supply for such jobs.

Baum (2017) further defined PropTech as comprising a series of verticals that facilitate information, transactions/marketplaces, and management/control, within the broader horizontals of Real Estate FinTech, Shared Economy, and Smart Real Estate. As the pace of technological change accelerates, innovation in real estate is increasingly driven by both established companies and new entrepreneurs, supported by strategic investments in start-ups (Hughes, 2017). Wilkerson (2019) noted the rapid proliferation of PropTech companies, with investments in the sector exceeding $12 billion annually, highlighting the significant impact of these technologies on property management. The rise of PropTech is reshaping the landscape of property management. Torres (2022) observed that numerous real estate industry players, particularly property managers, are leveraging PropTech to optimize their operations. Globally, venture capital investments in PropTech have reached $13.8 billion, underscoring the growing importance and impact of these technologies in the real estate sector. The integration of PropTech into the real estate industry marks a significant shift from traditional practices to technologically advanced solutions. This transformation is driven by the need for innovation and efficiency, as well as the growing recognition of the benefits that technology can bring to the sector. As the industry continues to evolve, the adoption of PropTech will likely play a crucial role in shaping the future of real estate,

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making it more responsive to market demands and better equipped to meet the needs of consumers and businesses alike.

Summarizing views from academics and practitioners, Taimatchi (2020) suggests that PropTech represents a collection of digital platforms, software, hardware, and innovative manufacturing materials designed to transform the real estate industry into a more transparent, sustainable, efficient, and effective sector. This transformation is expected to lead to major shifts in how real estate is traded, managed, and financed reflecting the profound impact of PropTech on the built environment.

2.2 Historical Context and Evolution of Proptech

In the genesis of technological integration within real estate, a milestone era identified as PropTech 1.0 emerged circa the mid-1980s in the United States and the United Kingdom (Baum, 2017). This epoch was characterized by the advent of personal computers and floppy disks in the late 1970s and early 1980s, fundamentally altering data processing with computer spreadsheets, thus revolutionizing analysis and research methodologies, allowing for more complex processing of data. However, despite these technological strides, challenges persisted, notably in the storage, transfer, and accessibility of vast data sets, accentuated by the burgeoning demand for swift and thorough data processing amidst the economic boom of the mid- to late-1980s.

As the 1990s unfolded, the burgeoning influence of the internet and introduction of the email system ushered in a new phase of technological evolution, fostering online commerce and connectivity (Coffman & Odlyzko, 2001). This era witnessed the rise of online marketplaces like Craigslist in the US and Exchange and Mart in the UK signalling a pivotal shift from print to web platforms for real estate transactions alongside other goods and services. Concurrently, advancements in data analysis, fuelled by mainframe computers, birthed property research entities such as the Investment Property Databank (IPD) and Prudential, catering not only to real estate investment but also extending benefits to the engineering, construction, and management sectors (Ojo, Oyetunji, & Oyetunji, 2018). During this period, software solutions such as Autodesk, Yardi, Argus, and CoStar emerged to cater to the needs of architecture, construction management, and investment decision-making within the real estate sector. Despite the innovation brought forth by Proptech 1.0, it faced challenges characterized by an oversupply of costly and non-collaborative real estate technology. This surplus failed to meet the demand for streamlined and accessible solutions, as observed by (Baum, 2017).

Propelled by the need for more efficient real estate transactions, PropTech 2.0 emerged at the turn of the 21st century, bridging the gap between its predecessor and public demand (ING, 2018). Baum (2017) contends that this evolution was underpinned by technological accessibility and affordability, epitomized by the ubiquity of mobile phones, PCs, cloud computing, Wi-Fi, and 4G technology. Client expectations shifted towards properties integrated with smart technology,

prompting the advent of PropTech 2.0 as a response to evolving consumer demands, gradually cementing its place as a cornerstone of modern real estate practices.

2.3 Acceptability and Growth of PropTech Globally

Morgan (2014) delved into the transformative impact of technology within the space of medical sciences, illuminating how technological advancements have revolutionized medical procedures and confronted associated challenges. Additionally, Morgan (2014) discerned a significant nexus between technology and the real estate industry, positing that this convergence portends the shaping of future landscapes. Central to her argument was the assertion that the interplay of property and technology ranging from tailored lease arrangements to holistic portfolio management and architectural innovation is poised to propel the industry towards heightened profitability. Morgan coined the term "PropTech" to encapsulate the burgeoning movement aimed at redefining the property sector. This encompasses a spectrum of innovations, including novel construction materials, online trading platforms for agents and investors, digital valuation tools, and eco-friendly building solutions, all geared towards ushering in a new era of efficiency and sustainability. Expanding upon Morgan's insights, the study delves into pragmatic strategies for leveraging technology to optimize property management and navigate contemporary challenges. Foremost among these is the imperative to transition towards remote property management, necessitating both robust technological infrastructure and a paradigm shift in managerial practices. By embracing cutting-edge PropTech solutions, such as self-guided property tours, automated maintenance workflows, and remotely controlled systems, property managers can streamline operations and minimize physical interactions within their premises.

Asensio and Navarro-Astor (2022) observed that in Spain the arrival of new companies that are more technological and scalable to the real estate sector has caused a revolution in a very conservative and not very innovative industry. Altus Group (2019) added that Investment in PropTech in the United Kingdom and United states has shown astonishing year-over-year growth. While a significant number of firms have now invested in integrated software solutions, many CRE firms are still using spreadsheets as their primary tool for key processes: 60% for reporting, 51% for valuation and cash flow analysis and 45% for budgeting and forecasting. This may be a symptom of the fact that many firms continue to operate with data silos and have yet to implement a strategy to adequately manage or integrate their data. Henry (2022) reported that Axel Brill, Managing Director, Hampleton Partners, United Kingdom stated that PropTech market does not appear to be slowing down, despite recent market volatility, as capital continues to flow in and the market remains thirsty for technological innovation, especially where it drives operational efficiency.

Tiwary (2021) added that in India the future of the industry is projected to primarily comprise CRM, Property Managemen, and FinTech software. According to an Asian real estate report, about 70% of real estate firms are expanding their PropTech investments. The top

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investment areas include Big Data (55%), the Internet of Things (32%), AI (42%) and Business Automation (32%). PropTech is here to stay, and as a result, the real estate industry is sure to boost exponentially. He stated that the numbers speak for themselves. In a newspaper publication by Schimmels (2022), the author noted that in Los Angeles, United States of America, some Chief Executive Officers like Peter Belisle of Jones Lang Lasalle Inc. stated that the impact of technology on real estate industry has accelerated dramatically over the past 10 years, Jll has implemented technology in its own practices while investing heavily on PropTech industry in general. In Finland, Sapkota (2019) posited that Finland have just started implementing the modern technologies, i.e. AI and ML, for the work order automation within property management. PropTech Finland is an organization that focuses the Finish start up community on scaling and integrating innovative technologies into the property management business. Taimatchi (2020) observed that in Dubai, United Arab Emirates, fundamentally, PropTech represents a positive change in the real estate industry – that will definitely be of great benefit to the end-customer. His research showed that multiple companies have adopted some of these technologies in one way or another, stating that the government is leading the role in the execution of these policies and programmes revolving in the infusion of PropTech in estate industry in United Arab Emirates.

Clark and Marshall (2023) stated that internationally the real estate industry has seen a sharp increase in its role in society and the service it renders. The change requirements on better client service, reporting on sustainability matters and compliance have sparked a bigger awareness in international markets on the role that PropTech can play as an enabler to assist real estate businesses with these "new" demands. They argued that in South Africa the need is even greater with the extra burden of load shedding, managing multiple tasks while municipal infrastructure crumbles and still providing a world class experience to international and local clients. The pair reiterated that In South Africa, renewable energy and energy security are becoming ubiquitous and technology will increasingly become more important to complement the management of these assets adding that, the carbon credit market is also a growing industry and certain property companies could benefit from PropTech innovations, leveraging tracking and reporting technologies in the future.

2.4 Property Technology (PropTech) and Traditional Property Management

Technology has revolutionized the real estate market, creating new opportunities to meet customer needs and introducing innovative business models for competition. Traditional real estate companies must now adapt to this evolving landscape to remain viable. The rapid transformation of the industry has been particularly pronounced since the onset of the COVID-19 pandemic. Akinwamide & Hahn (2021) observed that smart real estate adopts the use of smart technology to support real estate assets (this include both single property units and cities). Property managers across both multifamily and single-family rental segments have encountered rapidly shifting conditions. As a result, emerging trends have quickly become standard expectations in today's

residential market. From macro-level economic shifts to changing resident expectations, successful property managers are increasingly tech-savvy and resilient, pioneering innovation in residential property management. Adapting to technological advancements is no longer a differentiator but a necessity for managing properties to their fullest potential (Zandieh, 2022).

According to Salustri (2020), properties are as unique as fingerprints, which presents challenges in selecting a provider of property technologies. Property management involves various specialized components, necessitating a meticulous due diligence process for vetting vendors. Faizen (2021) noted that post-COVID-19, the demand for digital property management solutions had surged. These solutions offer a wider array of services, enabling property managers to meet evolving customer expectations and manage real estate portfolios remotely. Presently, the use of technology to enhance rather than replace human connections is essential for customer-focused property management. Constructing customer journey maps requires careful consideration of how technology is used at various tenant touch points. Programs facilitating online rent payments and maintenance requests, for instance, reduce customer effort but also decrease direct interaction between property managers and tenants. The impact of these trade-offs on tenant satisfaction depends on how property managers utilize the time saved through automation. If this time is allocated to tasks requiring a personal touch, technology can enhance human connections rather than diminish them (Torres, 2022).

Thus, PropTech is essentially a cross between the bricks-and-mortar and bits-and bytes worlds, an intersection of traditional real estate and modern technology. The age-old stereotype of building managers walking the floors with a tool belt hanging from the waist will be replaced by a new generation of tech-savvy managers armed with analytics and sensors (Haider & Stephen, 2021). It is now said that the PropTech tools encompasses the applicability of data analytics, smart home technologies and software applications aimed at optimizing computerized property management. Ekundayo and Sarki (2020) describe computerized property management as a system for capturing, storing, integrating, manipulating and analysing property-related data. This includes data on property particulars, construction costs, rental values, and service charge accounts. The use of computers in property management offers significant benefits including higher productivity, improved resource utilization and cost reduction. In their work, they restated that Estate Surveyors and Valuers are now faced with a range of software options for property management such as databases, word processing and spreadsheets. The benefits of using information and communication technology in property management include higher productivity, better utilization of resources and reduced overall costs.

Kim (2022) observed that the use of digital technology is not only innovative but also the most efficient and reliable method of managing risk. Transforming a product into a service increasingly relies on digital technology. Digitizing services reduces inefficiency in the market and optimizes the environment for both service providers and customers. Halliday (2021) highlighted an experiment from 2016 where AI outperformed real estate brokers in Colorado in finding the best homes for clients, showcasing the potential of AI in real estate. Essentially, this

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experiment pitted real estate brokers in Colorado against an AI to see which would find the best homes for clients and the robots won. Haider & Maranis (2021) have also noted that numerous technology vendors offer software and tools for improved building maintenance, promising significant savings and efficiencies. However, the abundance of choices presents challenges. Large landlords and building operators require expert evaluation of competing technologies before selecting one. Moreover, landlords will need assistance in implementing a suite of technologies sourced from various vendors.

Rieve (2021) highlighted PropTech's role in property management through smart home tools. He affirmed that smart home solutions which incorporate Internet of Things (IoT) devices and connectivity allow property managers to remotely monitor and control key aspects such as heating, lighting, security systems and tenant amenities. This not only boosts energy efficiency but also enhances tenant satisfaction and convenience. Rieve added that smart building technologies are more than single applications; they comprise integrated systems that are flexible, scalable, and resilient, capable of evolving with the changing needs of owners and tenants. He emphasized the importance of strategic partnerships with technology consultants, periodic tenant education on the use of applications, and the promotion of smart building capacities to prospective tenants. PropTech has improved efficiency systems, facilitated easy reporting of sustainability and energy metrics, and enhanced tenant experience, convenience, and productivity.

In other studies, Aina (2023) reported insights from experts at the Africa International Housing Show in Abuja, who suggested that incorporating PropTech could potentially reduce project costs by up to 50%. They noted that avoidable costs, such as agent fees, could be eliminated using AI virtual inspections, while transparent financing platforms could build investor trust. PropTech also offers solutions for crowd-funding and construction management alternative financing. Aina (2023) mentioned that the CEO of Octo5 Holdings Limited highlighted technology's role in accelerating real estate sector opportunities, which would reflect in product pricing. Ikokpu (2023) added that digital processes could reduce sales procedures by 50%, minimize human error, automate payments, and build trust, facilitating a borderless diaspora market. Siniak et al. (2020) concluded that technology could transform real estate practice through various innovations. These include using rich media visualization to improve customer experiences, collecting property data with IoT devices, embracing Building Information Modeling (BIM), employing AI-powered data analytics for insights, and streamlining workflows with digital image classification.

2.5 Integration and Impact of PropTech in Commercial and Residential Real Estate

In the scope of commercial real estate, the question of "what comes next" can be succinctly answered as "a lot." A July 2019 report from CREtech highlights that venture capital investors injected approximately $14 billion into PropTech startups during the first half of 2019 alone. These investments spanned a wide array of innovations, from AI-powered tenant risk assessment tools and automated design solutions to next-generation property management software and real-time

building and hazard information tools for property insurers (Brian, 2022). The advent of property technology has significantly transformed property management practices. Property managers now utilize interactive portals to attract buyers and sellers and employ sophisticated management software to streamline daily operations. Tenants and owners leverage digital platforms for tasks such as making payments and finding vacancies. This technological evolution has democratized the real estate market, fostering a competitive environment and simplifying the buying and selling processes, thereby bridging traditional gaps within the sector. Aihie (2019) suggested that technology has reduced the stress associated with property management by enabling managers to efficiently track multiple property portfolios, monitor progress, and strategically plan future expansions of properties within the organization purview. Kakulu (2003) argued that a computerized approach to property management enhances the ability to maintain an active property database, which is invaluable for planning and budgeting. Such systems can automatically extract and highlight important dates, such as lease renewals, and generate reminders and demand notices.

According to data from the Center for Real Estate Technology & Innovation (CRETI), venture capital investment in PropTech has surged with $9.3 billion funnelled into research and development since 2019. This influx of capital has driven advancements in rent payment solutions, space utilization, resident experience and sales and marketing (Zandieh, 2022). DeBacker (2020) added that emerging technologies not only enhance tenant experiences but also improve operational efficiencies and reduce costs. She emphasized that while PropTech provides substantial efficiency, it should complement, rather than replace, the traditional skill sets and tenant interactions of property managers. Historically, property managers have struggled to find time for tenant engagement beyond reporting and system oversight. By combining PropTech with analytical skills, managers can maximize tenant engagement. For instance, persistent work order requests from a tenant could prompt a direct call from the property manager to address the issue more effectively, possibly involving both building management and engineering. The rapid evolution of the PropTech sector underscores the need for new innovative solutions in our global digital economy. The rental market continues to experience disruption, with affordability and equity remaining central themes affecting both private and public markets.

Ogunba and Iroham (2005) as cited by Oladokun (2015) posited that no profession in the built environment should remain static; it must learn from the past, adapt to present realities, and anticipate future needs. This approach to sustainable professional practice is increasingly relevant in property management. A study by Kirk (2019) on the technology satisfaction of IREM members revealed that many property managers are reasonably satisfied with the technology solutions provided by their companies. A survey of IREM members in the U.S. and Canada in June showed that slightly more than half were somewhat or very satisfied with their technology platforms, while only 6.9 percent were very dissatisfied. Historically, spreadsheets have been a primary tool for property management, but there is a notable shift towards software that automates processes, reduces manual entry errors and improves data visualization. The shift from traditional tools like

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spreadsheets to advanced PropTech solutions reflects a broader trend of technological adoption in the real estate industry. This transition is driven by the need to manage complex operations more effectively and to remain competitive in a rapidly changing environment. By embracing innovation and investing in new technologies, the real estate sector can overcome its historical reluctance to change, addressing current challenges and positioning itself for future success. As the industry continues to evolve, the role of education and training will be crucial in preparing the workforce to leverage these new technologies, ensuring that the benefits of PropTech are fully realized. Essentially, the property management industry is undergoing a technological transformation, with a significant shift from spreadsheets to advanced software solutions. This transition is driven by the need for greater automation, accuracy, and data visualization. The findings from the IREM survey underscore this trend, revealing a clear preference among professionals for software over traditional spreadsheets in managing critical tasks such as rent rolls and accounting. As the industry continues to evolve, it is likely that the reliance on sophisticated software solutions will only increase, further enhancing the efficiency and effectiveness of property management practices.

Conclusively, the integration of PropTech into traditional property management represents a paradigm shift in the real estate industry. By leveraging digital tools and innovative strategies, property managers can enhance operational efficiency, improve customer satisfaction, and foster stronger tenant relationships. The future of property management lies in balancing technology with human touch, ensuring that technological advancements are used to complement and enhance the personal interactions that are vital to successful property management. As the PropTech sector continues to evolve, embracing both technological advancements and traditional skills will be crucial for navigating the future of commercial and residential real estate.

3.0 Methodology

The study adopted the survey research design and primary data collection was through the use of structured questionnaire administered on practicing Estate Surveyors and Valuers in Calabar. Purposive sampling technique was used in selecting the sample size which was made up of 30 registered Estate Surveyors and Valuers involved in property management in Calabar. The study used two sources of data collection i.e. primary and secondary sources of data collection. Data collected with the use of questionnaire was analysed with both descriptive and inferential statistics and the hypothesis formulated was tested using the Multiple Linear Regression.

4.0 Results and Discussion

Table 4.1: Respondents Characteristics

Variables	Frequency	Percent	Variables	Frequency	Percent
Gender			**Age Group**		
Male	4	18.2	25-34 years	3	13.6
Female	18	81.8	35-44 years	9	40.9
Total	**22**	**100.0**	45-54 years	4	18.2
			55 years and above	6	27.3
			Total	**22**	**100.0**
Level Education			**Occupation**		
Bachelor's Degree	13	59.1	Property Manager	17	77.3
Master's Degree	8	36.4	Real Estate Agent	2	9.1
Ph.D	1	4.5	Others	3	13.6
Total	**22**	**100.0**	**Total**	**70**	**100.0**
Years of Experience					
Less than 1 year	3	13.6			
1-5 years	9	40.9			
6-10 years	4	18.2			
Over 10 years	6	27.3			
Total	**22**	**100.0**			

Source: Researcher's Field Work, 2025

Table 4.1 shows the respondents characteristics ranging from gender to years of experience the respondents have in property management. The gender distribution of the respondents show that 81.8% of the respondents were males while 18.2% were females indicating that the study population was dominated by the male gender. On the age group of the respondents, 13.6% of the respondents were between 25-34 years of age, 40.9% were between the ages of 35-44 years, 18.2% of the respondents were between the ages of 45-54 years and 27.3% were 55 years and above. For level of education of the respondents, 59.1% of the respondents have Bachelor's degree, 9.1% were Master's degree holders while 13.6% of the respondents holds Ph.D in Estate Management. For occupation, 77.3% of the respondents were property managers, 9.1% real estate agents and 13.6% have other occupations. The data on years of experience of the respondents in property management shows that 13.6% of the respondents have years of experience of less than 1 year, 40.9% have years of experience between 1-5 years, 18.2% have experience of between 6-10 years, while 27.3% of the respondent's years of experience was over 10 years.

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Table 4.2: Awareness of Property Technology

Variables	Frequency	Percent	Valid Percent	Cumulative Percent
No	-	-	-	-
Yes	22	100.0	100.0	100.0
Total	22	100.0	100.0	

Source: Researcher's Field Work, 2025

Table 4.2 shows the awareness of Property Technology in the study area and from the response above 100.0% of the respondents were fully aware of Property Technology (PropTech). The result also shows that real estate practitioners are ready to utilize Property Technology in property management practice in the study area.

Table 4.3: How respondents first learnt about Property Technology

Variables	Frequency	Percent	Valid Percent	Cumulative Percent
Online Resources	10	45.5	45.5	45.5
Industry Seminars	10	45.5	45.5	90.9
Professional Associations or Groups	2	9.1	9.1	100.0
Total	22	100.0	100.0	

Source: Researcher's Field Work, 2025

Table 4.3 shows how respondents first learnt about Property Technology. From the responses above, 45.5% of the respondents first learnt about Property Technology through online resources and industry seminars while 9.1% of the respondents first learnt about Property Technology through professional associations or groups.

Table 4.4: Rating of overall knowledge of PropTech tools and solutions

Variables	Frequency	Percent	Valid Percent	Cumulative Percent
Not knowledgeable at all	3	13.6	13.6	13.6
Somewhat knowledgeable	10	45.5	45.5	59.1
Very knowledgeable	9	40.9	40.9	100.0
Total	22	100.0	100.0	

Source: Researcher's Field Work, 2025

Table 4.4 shows the rating of the overall knowledge of Property Technology tools and solutions in the study area. As shown above, 13.6% of the respondents were not knowledgeable about Property technology tools and solutions, 45.5% of the respondents were somewhat knowledgeable while 40.9% of the respondents were very knowledgeable of Property Technology tools and solutions.

Table 4.5: Property Technology tools aware of used for property management practice

Variables	Frequency	Percent	Valid Percent	Cumulative Percent
Online platforms	13	59.1	59.1	59.1
Property Management software	4	18.2	18.2	77.3
Virtual property tours	3	13.6	13.6	90.9
Tenant's communication platforms	2	9.1	9.1	100.0
Total	22	100.0	100.0	

Source: Researcher's Field Work, 2025

Table 4.5 shows the Property Technology tools the real estate practitioners are aware of and used in property management practice. The results above indicate that 59.1% of the respondents have used online platforms, 18.2% have used property management software, 13.6% have used virtual property tours while 9.1% have used tenant's communication platforms. The result here also show that the use of Property Technology is more effective in property management practice than the traditional property management practice.

Table 4.6: Factors influencing acceptability of Property Technology

Variables	Frequency	Percent	Valid Percent	Cumulative Percent
Cost of technology	11	50.0	50.0	50.0
Ease of use and user	5	22.7	22.7	72.7
Perceived impact	2	9.1	9.1	81.8
Availability of technology support	4	18.2	18.2	100.0
Total	22	100.0	100.0	

Source: Researcher's Field Work, 2025

Table 4.6 above shows the factors influencing adoption of Property Technology. The result shows that 50.0% of the respondents believed the factor influencing the adoption of Property Technology

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is cost of technology, 22.7% said it is ease of use and user-friendliness, 9.1% believed the factor is perceived impact and 18.2% of the respondents believed that the factor influencing the adoption of Property Technology is availability of technology support.

Table 4.7: Main barriers to accepting PropTech in property management practice

Barriers	**SD (1)**	**D (2)**	**N (3)**	**A (4)**	**SA (5)**	**F**	**Mean Score**	**Rank**
High initial cost	-	-	-	7 (28)	15 (75)	22	20.600	1st
Lack of knowledge or training	-	-	-	8 (32)	14 (70)	22	20.400	2nd
Resistance to change or traditional practices	12 (12)	6 (12)	-	2 (8)	2 (10)	22	8.400	4th
Limited technological infrastructure	13 (13)	9 (18)	-	-	-	22	6.200	5th
Data privacy and security concerns	-	-	-	9 (36)	13 (65)	22	20.200	3rd
Limited technical support	14 (14)	8 (16)	-	-	-	22	6.000	6th

Source: Researcher's Field Work, 2025

SD = Strongly Disagree, **D** = Disagree, **N** = Neutral, **A** = Agree and **SA** = Strong Agree

Table 4.7 shows the main barriers to adopting Property Technology in property management practice in the study area. Ranked 1st among the barriers is high initial cost with mean score of 20.600, ranked 2nd is lack of knowledge or training with mean score of 20.400 and ranked 3rd is data privacy and security with mean score of 20.200. The other barriers such as resistance to change or traditional practice, limited technological infrastructure and limited technical support were ranked 4th, 5th and 6th respectively.

Table 4.8: Benefits of using PropTech in property management

Benefits	**SD (1)**	**D (2)**	**N (3)**	**A (4)**	**SA (5)**	**F**	**Mean Score**	**Rank**
Improved efficiency in property management task	-	-	-	6 (24)	16 (80)	22	20.800	3rd
Reduced operational cost	-	-	-	10 (40)	12 (60)	22	20.000	4th
Better communication with tenants	10 (10)	8 (16)	-	4 (16)	2 (10)	22	10.400	5th
Improved transparency in transaction	12 (12)	5 (10)	-	3 (12)	2 (10)	22	8.800	6th

Easy property listing and marketing	-	-	-	4 (16)	18 (90)	22	21.200	1st
Enhance data analysis and reporting	-	-	-	5 (20)	17 (85)	22	21.000	2nd

Source: Researcher's Field Work, 2025
SD = Strongly Disagree, **D** = Disagree, **N** = Neutral, **A** = Agree and **SA** = Strong Agree

Table 4.8 above shows the benefits of using Property Technology in property management. From the above result, ranked 1st among the benefits is easy property listing and marketing with mean score of 21.200, 2nd is enhance data analysis and reporting with mean score of 21.000, 3rd is improved efficiency in property management task with mean score of 20.800 and 4th is reduced operational costs with mean score of 20.000. Ranked 4th and 5th among the benefits are better communication with tenants and improved transparency in transaction with each a mean score of 10.400 and 8.800 respectively.

Table 4.9: Challenges in using Property Technology for property management

Challenges	**SD (1)**	**D (2)**	**N (3)**	**A (4)**	**SA (5)**	**F**	**Mean Score**	**Rank**
Difficulty in using the technology	-	-	-	4 (16)	18 (90)	22	21.200	1st
High initial investment cost	-	-	-	6 (40)	16 (60)	22	20.000	4th
Lack of local support or training resources	-	-	-	9 (36)	13 (65)	22	20.200	3rd
Concerns over data privacy	-	-	-	5 (20)	17 (85)	22	21.000	2nd
Dependence on internet connectivity	5 (5)	6 (12)	3 (9)	5 (20)	4 (20)	22	13.200	5th
Resistance from tenants and stakeholders	16 (16)	6 (12)	-	-	-	22	7.600	6th

Source: Researcher's Field Work, 2025
SD = Strongly Disagree, **D** = Disagree, **N** = Neutral, **A** = Agree and **SA** = Strong Agree

Table 4.9 presents data on the challenges in using Property Technology for property management practice. The result of the data presented above indicates that difficulty in using the technology is ranked 1st among the challenges with mean score of 21.200, ranked 2nd among the benefits is concerns over data privacy with score of 21.000, 3rd is lack of local support or training resources having a mean score of 20.200, ranked 4th is high initial investment cost with mean score of 20.000, dependence on internet connectivity and resistance from tenants and stakeholders were the least ranked benefits each having a mean score of 13.200 and 7.600 respectively.

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Table 4.10: How traditional property management practices compare to PropTech-enabled practices in terms of operational efficiency

Variables	Frequency	Percent	Valid Percent	Cumulative Percent
PropTech enabled practices are much more effective	17	77.3	77.3	77.3
PropTech enabled practices are somewhat more efficient	2	9.1	9.1	86.4
Both are equally efficient	2	9.1	9.1	95.5
Traditional practices are more efficient	1	4.5	4.5	100.0
Total	22	100.0	100.0	

Source: Researcher's Field Work, 2025

Table 4.10 shows comparison of traditional property management and Property Technology enabled practices in terms of operational efficiency. From the result above, 77.3% of the respondents believed that Property Technology enabled practices are much more effective, 9.1% of the respondents believed Property Technology enabled practices are somewhat more efficient and 9.1% of the respondents also feel both are equally efficient. Only 4.5% of the respondents believed traditional practices are more efficient. The above result generally implies that Property Technology enabled practices are much more effective than the traditional property management practices.

Table 4.11: How PropTech affect the overall management of properties compared traditional methods

Variables	Frequency	Percent	Valid Percent	Cumulative Percent
Unsure	1	4.5	4.5	4.5
Both methods are equally effective	3	13.6	13.6	18.2
Somewhat effective with PropTech	3	13.6	13.6	31.8
Much more effective with PropTech	15	68.2	68.2	100.0
Total	22	100.0	100.0	

Source: Researcher's Field Work, 2025

The result from table 4.11 shows how Property Technology affect the overall management of properties compared to the traditional methods. From the tabulated responses above, 4.5% of the

respondents were not sure whether Property Technology affect the overall management of properties compared to traditional methods. Again, 13.6% of the respondents believed both methods are equally effective and somewhat effective with Property Technology while 68.2% of the respondents believed that property management is much more effective with Property Technology.

Table 4.12: Strategies recommended to increase awareness of PropTech among property managers in Cross River State

Variables	Frequency	Percent	Valid Percent	Cumulative Percent
Organizing workshops and training sessions	18	81.8	81.8	81.8
Peer-to-peer sharing of experience and success stories	2	9.1	9.1	90.9
Industry-specific conferences or Expos	2	9.1	9.1	100.0
Total	22	100.0	100.0	

Source: Researcher's Field Work, 2025

Table 4.12 result shows recommended strategies to increase awareness of Property Technology among property managers in Cross River State. From the responses above, 81.8% of the respondent s recommended organizing of workshops and training sessions for property managers. On the other hand 9.1% of the respondents both recommend peer-to-peer sharing of experience and success stories and industry-specific conferences or expos.

Table 4.13: Role ESVARBON/NIESV should play in supporting the acceptability of PropTech in property management in Cross River State

Variables	Frequency	Percent	Valid Percent	Cumulative Percent
Providing financial incentives or subsidies	14	63.6	63.6	63.6
Offering technical training programmes	8	36.4	36.4	100.0
Total	22	100.0	100.0	

Source: Researcher's Field Work, 2025

Table 4.13 shows the role to be played by ESVARBON/NIESV in supporting the adoption of Property Technology in property management in the study area. The responses above indicate that

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63.6% of the respondents recommend that government should provide financial incentives or subsidies while 36.4% of the respondents recommend that government should offer technical training programmes in the study area.

Table 4.14: Types of training or support would make it easier for property managers to adopt PropTech solutions

Variables	Frequency	Percent	Valid Percent	Cumulative Percent
Hands-on training workshops	17	77.3	77.3	77.3
Online courses	5	22.7	22.7	100.0
Total	22	100.0	100.0	

Source: Researcher's Field Work, 2025

Table 4.14 shows the type of trainings or support that would make it easier for property managers to adopt Property Technology solutions. The responses indicate that hands-on training workshops as represented by 77.3% of the respondents and online courses represented by 22.7% of the study respondents.

Table 4.15: Recommendation offered to enhance the adoption and acceptability of PropTech in Calabar Metropolis

Variables	Frequency	Percent	Valid Percent	Cumulative Percent
Public awareness	19	86.4	86.4	86.4
Funding	2	9.1	9.1	95.5
Internal and External training	1	4.5	4.5	100.0
Total	22	100.0	100.0	

Source: Researcher's Field Work, 2025

Table 4.15 shows that recommendations offered to enhance the adoption and acceptability of Property Technology in the study area. From the responses above, 86.4% of the respondents recommended public awareness, 9.1% of the respondents recommended funding while 4.5% of the respondents recommended internal and external training respectively.

Test of Hypothesis

Ho: There is no significant effect of PropTech on traditional property management practice.

H1: There is significant effect of PropTech on traditional property management practice.

The multiple linear regression was computed as shown below.

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Enhance data analysis and reporting, Improved transparency in transaction, Reduced operational cost, Easy property listing and marketing, Improved efficiency in property management task, Better communication with tenants[b]	.	Enter

a. Dependent Variable: PorpTech affect the overall management of properties compared to traditional methods

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.956[a]	.914	.880	.31623

a. Predictors: (Constant), Enhance data analysis and reporting, Improved transparency in transaction, Reduced operational cost, Easy property listing and marketing, Improved efficiency in property management task, Better communication with tenants

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.955	6	2.659	26.591	.000[b]
	Residual	1.500	15	.100		
	Total	17.455	21			

a. Dependent Variable: PorpTech affect the overall management of properties compared to traditional methods

b. Predictors: (Constant), Enhance data analysis and reporting, Improved transparency in transaction, Reduced operational cost, Easy property listing and marketing, Improved efficiency in property management task, Better communication with tenants

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Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-7.250	1.071		-6.767	.000
	Improved efficiency in property management task	.750	.354	.375	2.121	.001
	Reduced operational cost	.250	.252	.140	.991	.337
	Better communication with tenants	1.669E-016	.170	.000	.000	1.000
	Improved transparency in transaction	3.148E-016	.147	.000	.000	1.000
	Easy property listing and marketing	1.250	.354	.541	3.536	.003
	Enhance data analysis and reporting	-1.254E-014	.447	.000	.000	.000

a. Dependent Variable: PorpTech affect the overall management of properties compared to traditional methods

The correlation coefficient (R) = 0.956
Coefficient of Determination (R^2) = 0.914
$P < 0.05$
Degree of freedom = 21
F-calculated = 26.591
F-tabulated = 2.69

The Regression Model R^2 is significant with $F_{0.05, 6.15}$ Cal. = 26.591 and $F_{0.05, 6.15}$ Tab at $P < 0.05$ level and d.f. (6, 15 = 2.69). The regression model shows that the correlation coefficient (r) was computed at $p < 0.05$ while the result shows that F calculated is significant at 0.000 which indicates that the predictor variables (Enhance data analysis and reporting, Improved transparency in transaction, Reduced operational cost, Easy property listing and marketing, Improved efficiency in property management task, Better communication with tenants) are statistically significant at $p < 0.000$ less than 0.05. The Regression coefficient R= 0.956 implies a positive correlation between the dependent and the respective independent variables in the study. The R^2 indicates that there is 91.40% variation from the dependable variable. When the effects were taken individually, only three i.e. Enhance data analysis and reporting, Easy property listing and marketing and Improved efficiency in property management task were significant while the other three effects were not. Therefore, the null (Ho) hypothesis is rejected and the alternate (H_1) hypothesis is accepted and concludes with 95% confidence that there is significant

effect of PropTech on traditional property management practice. This finding implies that Property Technology works hand in hand with the traditional property management practices as seen to be more efficient and effective when adopted in Calabar. The findings also indicate that there is awareness of Property Technology, its adoption and acceptability into the real estate practice in the study area will be welcomed as Property Technology shows to be more effective in property management when fully adopted than the traditional property management practice in the study area.

5.0 Conclusion and Recommendations

The study examined the acceptability of Property Technology (PropTech) in property management practice in Cross River State, with particular focus on residential and commercial properties in Calabar Metropolis. The study determined the extent to which PropTech solutions are recognized, adopted and integrated into routine property management activities within the study area. The study assessed the current level of awareness and knowledge of PropTech among property managers and relevant stakeholders in Calabar Metropolis, the factors influencing the acceptability and adoption of PropTech in property management practice, the perceived benefits and challenges associated with the use of PropTech tools and to compare the effectiveness of traditional property management practices with PropTech-enabled approaches in terms of efficiency, service delivery, cost management and performance outcomes. The study concludes that there is a high level of awareness and willingness among real estate practitioners to accept PropTech. While challenges such as cost, lack of training, and cultural resistance persist, the benefits including improved efficiency and tenant satisfaction strongly support increased acceptability. PropTech is widely recognized but acceptability is hindered by costs, training gaps, and cultural resistance. Operational efficiency and tenant satisfaction are significantly higher with PropTech. Targeted interventions (training, subsidies and awareness) are critical for broader acceptability in Cross River State. Strategies such as awareness campaigns, training programs and ESVARBON/NIESV support are essential to foster greater integration of PropTech in property management. The study recommends targeted training and capacity building, financial support and incentive mechanisms, public awareness campaigns, addressing data privacy concerns and institutionalization of PropTech in Professional Development seminars/workshops.

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References

Aihie, V. U. (2019). The PropTech Revolution: The Imperatives for Nigeria's Estate Surveying and Valuation Professionals to Catch Up or Get Left Behind. *Journal of African Real Estate Research*, 4(2), 56-75.

Aina, O. E. (2023). PropTech adoption in Nigeria. In Odusolu (Ed.), Digital transformation in Nigerian real estate.

Altus Group. (2019). The Innovation Opportunity in Commercial Real Estate: A Shift in PropTech Adoption and Investment. Retrieved from https://www.peievents.com/en/wpcontent/uploads/2018/12/CRE-Innovation-Report-2023.pdf CRE-Innovation-Report-2019.pdf on 20th August 2023

Akinwamide, D. O., & Hahn, J. (2021). An Appraisal of the Adoption of Innovative Technologies for Sustainable Real Estate Practice in Edo State, Nigeria. Proceedings of the 20th Annual Conference of African Real Estate Society (AfRES) in Zambia.

Asensio-Soto, J. C., & Navarro-Astor, E. (2022). Proptech: A qualitative analysis of online real estate brokerage agencies in Spain. *Intangible Capital*, 18(3), 489-505.

Baum, A. (2017). PropTech 3.0: The future of Real Estate. Said Business School, University of Oxford. Retrieved on 20th August 2023 from http://eureka.sbs.ox.ac.uk/6485/1/122037%20PropTech_FINAL.pdf.

Brian, M. (2022). PropTech: A look at what comes next in CRE. *Finance and commerce (Regular daily ed.*) Retrieved from https://finance- commerce.com/2020/02/proptech-a-look-at-what-comes-next-in-cre/

Crook, M. (2018). What's Coming, What's Here, and Do We Care? *Building,* 68(1), 23-25. Retrieved from file:///C:/Users/User/Downloads/What's_Coming,_What's_Here,_an.pdf

DeBacker, J. (2020). PropTech Needs to Complement, Not Replace, Interaction Between Tenants and Property Managers. Wealth Management. Retrieved on 24th August 2023 from https://www.wealthmanagement.com/real-estate/proptech-needs-to-complement-not-replace-interaction-between-tenants-and-property-managers

Donati, A. (2018). 7 Questions on Proptech That Will Make You Sound Like A Pro Forbes. Retrieved from http://www.forbes.com/sites/angelicakrystledonati/2018/09/24/7-questions-on-proptech-that-will-make-you-sound-like-a-pro/?sh=84f304a5bae7

Ekundayo A., & Sarki, K. (2020). An Evaluation of impact of Information and communication Technology on Real estate Management in Nigeria. *British Journal of computer, Networking and Information Technology* 3(1), 1-6. ISSN: 2689-5315. Retrieved from https://abjournals.org/bjcnit/wpcontent/uploads/sites/11/journal/published_paper/volume-3/issue-1/BJCNIT_rBQBbDoB.pdf

Haider, M., & Moranis, S. (2021) Why property data must be under one roof for proptech; Toronto, Canada. *Postmedia Network Inc*. Retrieved from https://manchester.idm.oclc.org/login?url=https://www.proquest.com/newspapers/whyproperty-data-must-be-under-one-roof-proptech/docview/2476053496/se2?accountid=12253

file:///C:/Users/User/Downloads/ProQuestDocuments-2023-05-15%20(5).pdf

Halliday, M. (2021). Transforming The Proptech Industry. *Globe and mail* (ppB6) Retrieved from https://www.librarysearch.manchester.ac.uk/discovery/fulldisplay?docid=cdi_proquest_newspapers_2543955540&context=PC&vid=44MAN_INST:MU_NUI&lang=en&search_scope=MyInst_and_CI&adaptor=Primo%20Central&tab=Everything&query=any,contains,proptech%20and%20property%20management&offset=50file:///C:/Users/User/Downloads/TRANSFORMING_THE_PROPTECH_INDU.pdf

Hughes, D. (2017). Proptech Prospects. *Property Journal*, (p.26). Retrieved from https://www.proquest.com/docview/1933847959/fulltextPDF/5696CB10F5124A72PQ/1?accountid=12253

Kakulu, I. (2003). *Computerized Approach to Real Estate Practice in Nigeria*. Port Harcourt, Nigeria: IBK Publication.

Kim, J. (2022). Effect of the Standardization of Service Platforms for High-Involvement PropTech Services. *Sustainability (Basel, Switzerland),* 14 (9), 5036.

Kirk, N. (2019). Embracing Proptech: Real estate technology goes beyond IT to become part of smart business practices. *Journal of Property Management*, 84(1), 32-40. Retrieved from https://www.proquest.com/docview/2190954924/fulltextPDF/23C21236115B44B3PQ/1?accountid=12253

Morgan, J. (2014). At The Tech/Property Seam. *The Estates Gazette* (p.55).

Ojo, B., Oyetunji, B., & Oyetunji, A. (2018). Barriers to ICT Deployment in the Nigerian Real Estate Practice. *FULafia Journal of Science & Technology*, 4(2), 5-7.

Oladokun, T. T. (2015). Sustainable Property Management Practice in Nigeria. *International Research Conference on Sustainability in Built Environment Proceedings of International Research Conference on Sustainability in Built Environment*, pp 157-165.

Sapkota, K. (2019). Artificial Intelligence in Property Management Automation - Technologies, Current Applications and Challenges. Bachelor's Thesis at Turku University of Applied Sciences Degree Programme in Information Technology. Pp43 Retrieved from https://www.theseus.fi/handle/10024/273564https://urn.fi/URN:NBN:fi:amk202001271633https://www.theseus.fi/bitstream/handle/10024/273564/Krishna%20sapkota%20thesis_TUAMpdf?sequence=2&isAllowed=y

Salustri, J. (2020). A proptech plan . *Journal of Property Management*, 85(5), 38-39. Retrieved from https://www-proquest-com.manchester.idm.oclc.org/docview/2553025799/fulltextPDF/45C31BD3A8342FEPQ1?accountid=12253

Schimmels, J. (2022). Proptech: Firms Bullish on New way to sell and Buy. *Los Angeles Business Journal*, 44(40), 75. Retrieved from https://go-gale-com.manchester.idm.oclc.org/ps/i.do?p=ITOF&u=jrycal5&id=GALE%7CA727055489&v=2.1&it=r file:///C:/Users/User/Downloads/Transforming_Real_Estate_PROPT.PDF

https://doi.org/10.5281/zenodo.20677958

Siniak, N., Kauko. T., Shavrov, S. & Marina, N. (2020). The impact of PropTech on real estate industry growth. IOP Conference Series Materials Science and Engineering 869 (6)2041. doi:10.1088/1757-899X/869/6/062041 Retrieved from https://www.researchgate.net/publication/342849394_The_impact_of_proptech_on_real_estate_industry_growthThe_impact_of_proptech_on_real_estate_industry_gro_NICOLIA ET AL.pdf

Taimatchi, M. (2020). The implications of Proptech on the real estate brokerage. The case study of the Dubai, United Arab Emirates. *School of Energy, Geoscience, Infrastructure and Society* Retrieved from: https://www.researchgate.net/publication/342314751 file:///C:/Users/owner/Desktop/hod%20materials/TheimplicationsofProptechontherealestatebrokerage.ThecasestudyofDubaiUnitedArabEmirates.pdf

Tiwary, P. (2021). *How PropTech Is redefining Residential Real Estate Business world*, New Delhi India, Athena Information Solutions Pvt. Ltd. Retrieved from https://manchester.idm.oclc.org/login?url=https://www.proquest.com/magazines/howproptech-is-redefining-residential-real/docview/2563776386/se-2?accountid=12253 file:///C:/Users/User/Downloads/ProQuestDocuments-2023-05-15%20(2).pdf

Torres, D. (2022). Transforming Real Estate PROPTECH: Software and data are changing industry. *Los Angeles BusinessJjournal*, 44 (44), 1-5. Retrieved from https://go-gale-com.manchester.idm.oclc.org/ps/i.do?p=ITOF&u=jrycal5&id=GALE%7CA727055489&v=2.1&it=r file:///C:/Users/User/Downloads/Transforming_Real_Estate_PROPT.PDF

Zandieh, A. (2022). Here to stay: Top trends in Proptech for residential property managers. *Journal of property management*, 87(5), 6-11.