AN EXAMINATION OF THE POTENTIAL OF PROPTECH (PROPERTY TECHNOLOGY) IN LAGOS REAL ESTATE MARKET

A PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF BACHELORS OF SCIENCE (B.Sc.) DEGREE IN ESTATE MANAGEMENT

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CERTIFICATION

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DEDICATION

This research work is dedicated to God Almighty, the source of everything, the giver of inspiration and ability to write this research work. I also want to dedicate this research work to my ever loving and prayerful parents Mr Ibukun Jolayemi & Mrs Kudirat Jolayemi and my beloved siblings and friends.

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ABSTRACT

This research project aims to explore the potential of PropTech within the dynamic Lagos real estate market. The study revolves around three core objectives: firstly, to gauge the extent of PropTech adoption and utilization; secondly, to assess perceptions and challenges related to its implementation; and thirdly, to evaluate the future outlook and possibilities of PropTech in Lagos. The research employs a quantitative approach, utilizing surveys to gather data, which is then analyzed using descriptive statistics.

The results reveal a notable increase in the adoption of PropTech tools, with online listing and rental platforms being the most widely embraced by respondents. They recognize numerous benefits of PropTech, such as enhanced efficiency, improved effectiveness, and enriched customer experience. However, respondents also acknowledge significant challenges, including limited funding, low awareness, regulatory complexities, and resistance to change.

Moreover, the study uncovers a sense of optimism among participants about the future of PropTech. Technologies like blockchain, virtual reality, augmented reality, and predictive analysis hold promise and are anticipated to shape the industry's trajectory moving forward.

In conclusion, this research offers valuable insights into the potential of PropTech in the Lagos real estate market. The study proposes recommendations to enhance awareness, foster collaboration, tackle adoption barriers, monitor industry trends, and promote data sharing and standardization. By implementing these recommendations, stakeholders can effectively integrate PropTech into the Lagos real estate landscape, unlocking its transformative potential.

CHAPTER 1

INTRODUCTION

1.1 Background To the Study

Nigeria's environmental, social, and economic conditions must continue to improve if the Sustainable Development Goals (SDGs) are to be implemented. This implementation of such goals has been greatly influenced by the UN through provision of technical support when needed. Sustainable Development Goal 11 refers to the sustainability of cities and communities which implies the growth of the real estate market in Nigeria (United Nations, nd)

The real estate market in Nigeria emanated from the need to provide shelter for its habitant and over the year human needs began to increase as real estate properties are not only a form of shelter but also used for commercial and hospitality purposes (Jolaoso, 2018). In achieving Sustainable Development Goal 11, the impact of Technology is of great essence as questions relating to online purchase of properties, provision of a general data bank of properties to the public, ease of payment, etc. have risen, and stakeholders are beginning to see the need to leverage on technology for a faster, transparent and more effective workflow in the real estate sector (Ibanga, 2022). As such, we can conclude that the real estate market requires the advent of new technologies to meet the economy's current and future market needs.

According to (Ascendix, 2023), PropTech, or property technology, are all the technological tools, real estate experts use to optimize the way people buy, sell, research, market, and manage a property. It can also be described as a movement driving a mentality change in the real estate industry and its customers regarding technology-driven innovation in the transaction, data assembly, and design of buildings and cities (Dearsley & Bawn, 2017). These technology-driven innovations go by a variety of names depending on how they are perceived, including

Real Estate Tech, ReTech, RealTech, and CRE Tech. Some examples of such innovations include online platforms for property search and transaction, virtual reality for property viewing, smart building technology, and blockchain for property finance. Over the last ten years, the industry in Nigeria has evolved from 1.0 to 2.0 and is now steadily transitioning into 3.0 at its core.

PropTech can be traced to the dotcom boom around the year 2000, which allowed traditional high street estate agents to operate online. The United Kingdom and United State were the first to experiment PropTech in their real estate industry which became a massive success (Dearsley and Bawn, 2017). According to the PropTech Global Trends (2020), PropTech is present in 64 countries worldwide, with a soaring number of 8000 firm. The Incorporation of PropTech was to eradicate the manual and tedious workflow of most real estate companies (Garratt, 2022).

In Nigeria, the emergence of the first PropTech firm in 2018 marked the beginning of a significant shift in the real estate industry. Companies like Tolet.ng (now called PropertyPro Nigeria) and Nigerian Property Centre paved the way for the growth of PropTech in the country. Since then, the PropTech landscape in Nigeria has expanded, giving rise to approximately 59 firms, each with its own unique impact. The initial phase of PropTech innovation in Nigeria aimed to address the need for a trusted platform where people could access information on available properties, enabling informed decision-making and facilitating due diligence processes. This development has revolutionized the real estate sector and has provided individuals with greater transparency and convenience in property transactions.

The Impact of PropTech can be categorized into various groups based on the range of products and services it offers. These include Property Listings, which involve the listing and advertising of properties for sale; Investment and Financing, which enable co-investment to finance property construction; Property and Community Management, which provide integrated tools

for managing properties within communities and homes; and Flexible Living, which encompasses co-living spaces and peer-to-peer housing platforms like Airbnb, 989 Workspaces, Easy Offices, and more. These are just a few examples of the diverse applications and services provided by PropTech in the real estate industry. (Alex-Adedipe, 2020).

In line with the above discussion, the study looks to examine the potential of Property Technology for unlocking real estate market opportunities in Lagos.

1.2 Statement of Research Problem

Real estate is one of the largest industries in the world, and as a result, new trends are constantly emerging across the industry. From co-working to co-living, the real estate industry innovates and shapes its activities to fill the demand. Since 2014, the PropTech sector has been noticeably experiencing strong growth, as it has 186 million USD globally in 2011 to 2.67 billion USD in 2016 and 12 billion USD in 2017 (Kene-Okafor, 2021). In the Mid-Year 2018, Global PropTech Confidence Index from MetaProp found that 96% of investors plan to make the same or more PropTech investments from 2021 to 2022 and this is a 76% increase from the year before. Interestingly, a growing percentage of these investments is going towards companies in their growth stage.

Investing in PropTech offers numerous benefits and opportunities for the real estate industry. As seen in other sectors like transportation and finance, technology innovation has revolutionized operations and improved user experiences. Similarly, the real estate industry can leverage PropTech to address its traditional pain points. By embracing innovative technologies and solutions, the industry can overcome challenges such as inefficiencies, lack of transparency, and limited accessibility. PropTech has the potential to streamline processes, enhance operational efficiency, and provide a better overall experience for stakeholders in the real estate market. Therefore, investing in PropTech is crucial for the industry to stay

competitive, adapt to changing market dynamics, and unlock new growth opportunities (Braseeman, 2017, Baum, 2017).

A non-exhaustive list of PropTech technologies includes Home Matching Tools, Drones, Virtual Reality (VR), Building Information Modelling (BIM), Data Analytics Tools, Artificial Intelligence (AI), Internet of Things (IoT), Blockchain, Smart Contracts, Crowdfunding in the Real Estate Sector, Financial Technologies (FinTech's) related to real estate, Smart Cities and Regions, Smart Homes, and Shared Economy. All these relatively recent innovations have the potential to improve productivity, competitiveness, increase efficiency of energy and resource, hence protect the environment and provide opportunities for developed and developing countries to achieve economic growth and sustainable development in line with the 2030 Agenda for Sustainable Development (Yu, S., Song, C., Sanbur, A., Gultekin, A. B., Siniak, N., Kauko, T., Shavrov, S., & Marina, N., 2023). Embracing PropTech in the real estate sector would cater for better sustainable Community.

1.3 Aim and Objectives of The Study

The study aims to examine the potential of the PropTech in the Lagos Real Estate Market, Nigeria with a view to understanding its capacity for enhancing operational efficiency, improving customer experiences, and driving innovation within the Traditional Real Estate Market.

The objectives of the study are to:

a) ascertain the adoption and utilization of PropTech in the Lagos real estate market.

b) evaluate perceptions, and challenges of utilizing PropTech in Lagos real estate market.

c) evaluate the future prospect of PropTech in Lagos real estate market.

1.4 Justification For the Study

The justification for conducting this research study lies in the exploration of the potential of adopting PropTech in the Lagos real estate market. This study aims to contribute to the existing body of knowledge on PropTech adoption, particularly in emerging markets like Lagos. By shedding light on the potential benefits and challenges of implementing PropTech in the real estate industry, this research can provide valuable insights that inform policy and decision-making processes. Ultimately, this study seeks to bridge the gap in understanding and provide guidance for the effective utilization of PropTech in the dynamic real estate market of Lagos.

Moreover, the existing literature on PropTech adoption in developing nations is limited, emphasizing the necessity for a comprehensive study that examines the potential of adopting PropTech in the Lagos real estate market. As PropTech continues to gain global recognition as a transformative solution, it is crucial for Nigeria to embrace this innovation and ensure its inclusion in the real estate industry. This study aims to provide valuable insights that inform the development of strategies to promote the implementation of PropTech in the Lagos real estate market.

The real estate market in Nigeria has witnessed remarkable growth due to factors such as the rise of the middle class, urbanization, and increased foreign direct investment. However, it still faces significant challenges, including lack of transparency, inefficiency, and limited access to financing. These obstacles have hindered investment and impeded sectoral growth. PropTech presents an opportunity to address these challenges by applying innovative technologies across the real estate value chain. Despite its potential, the adoption of PropTech in Nigeria has been slow, necessitating an exploration of its potential in Lagos real estate market, the nation's commercial hub and largest real estate market.

Furthermore, the research literature lacks sufficient studies on the growth of PropTech and its broader economic benefits. Filling this research gap is essential to better understand the potential impact of PropTech adoption and its contribution to the overall economy. By conducting this study, I aim to bridge this gap and provide valuable insights into the growth and potential benefits of PropTech in the Lagos real estate market.

1.5 Scope of Study

The scope of this research study will be limited to the adoption of PropTech 1.0 to 3.0. At the current date of research, it is presumed that the growth of PropTech globally has shifted to PropTech 4.0 but this research study would not explore such an opportunity as a lot of solutions to real estate challenges from the previous phase of PropTech is yet to be enforced in the allocated study area for this research.

Furthermore, in fulfilling the aim of this research study, information about the impact of PropTech globally would be collected and justified in other to see the potential of such opportunities in Lagos, Nigeria. The study would also be examining growing start-ups that have experienced the use of PropTech 1.0, 2.0, and 3.0.

1.6 Limitations of the Study

This research focuses on the impact of PropTech on the real estate market in Lagos, Nigeria which is currently updated with the development of PropTech 1.0, 2.0, 3.0 (e.g., Online listing of properties, etc.), and little or no update on the development of PropTech 4.0. It will be limited to all available resources that can be gotten from the users of PropTech in the Lagos Real Estate market.

1.7 Study Area

Lagos State, located in southwestern Nigeria, is one of the most populous states in the country and is also known as the commercial hub of Nigeria. The state is known for its booming economy and rapidly growing population, making it a prime location for the development of PropTech. In Lagos State, there is a developing requirement for proficient and innovative solutions to address the challenges in the real estate sector. The state has a large population and a high demand for housing, but the supply of affordable and well-maintained properties is limited. Additionally, the traditional methods of buying and selling property in Lagos State are often time-consuming and complex, making it difficult for buyers and sellers to navigate the market.

The potential for PropTech in the Lagos real estate market has been said to be high as it can address these challenges and improve the overall real estate market through the use of online platforms, digital tools, and data analytics. The government and private sectors in Lagos are increasingly recognizing the potential of PropTech, which is likely to lead to more PropTech companies and start-ups emerging shortly.

CHAPTER 2

LITERATURE REVIEW

2.1 Preamble

In this chapter, a well thought-out and comprehensive explanation of aim, objectives and some key words in the research topic are clearly expressed in a theoretical and conceptual form followed by the review of past studies on the subject matter of the research with a view to adding to the body of knowledge and creating reasonable gap in the literature.

2.2 The Advent of PropTech

The real estate market consists of the sales, purchase, and management of landed properties. It involves residential, commercial, and industrial properties and includes a large range of real estate practices like property management, property valuation, property development, and property investment. It is also a fundamental part of the economy and assumes a critical part in advancing urbanization, increasing the employment rate, and improving the economic growth of a country (Mattarocci & Scimone, 2023). However, the practice of the real estate sector has been dependent on manual means as most real estate practices rely on customary practices like manual desk work and up close and personal communications. It is then presumed that considering the advancement in technology, the real estate sector has been too slow in adopting the change in its practice as a lot of real estate practitioners still use paper and pen to solve their day-to-day tasks (Cock, 2022).

Nonetheless, recently, the sector has gone through significant technological advancements, with the presentation of different innovative tools, for example, online platforms for property search and transaction, virtual reality for property viewing, etc. These technological advances have contributed on the growth of the real estate sector, making it simpler for clients to access information's and for real estate businesses to deal with their activities. Hence the initiation of

PropTech, as the goal for the introduction of PropTech is to change how the real estate business works and upgrade the client experience. According to a report by PropTech Knowledge (2021), the global PropTech market is supposed to fill essentially before very long, arriving at a worth of USD 228 billion by 2025. With this momentum, PropTech is now one of the biggest trends in the real estate sector as it has gone through four classifications of developments beginning around 2007 and each wave have reflected a contemporary pattern in the more extensive tech environment.

According to the origin of PropTech (Dearsley and Bawn, 2017), PropTech started following the dot-com boom which bought about the first classification of PropTech (PropTech 1.0). PropTech 1.0 was created with the goal to increase customers' confidence in online transactions of property sales, purchases, and rentals. It incorporated the use of online tools like social media and eCommerce websites where online transactions were done and the difficulty of finding real estate information online was solved (Siong, 2019). PropTech 1.0 has developed into companies like PropertyPro, Nigerian Property Center, List Property, and Private Property, among others; which have become trusted platforms to buy, sell, and rent properties in Lagos. Incomes for business in this space are generated from fee charges predominantly on the pre-deals front as lead generators for real estate agents, yet most post-lead land exchanges are still manual.

The second classification of PropTech started in 2014 when Tech Developers decided to dive into the benefits of the implementation of data analysis and virtual experience in the real estate sector. PropTech 2.0 led to the creation of innovations that offer customers specialized services from the confront of their devices. Examples of such companies in Lagos incorporating such tools in real estate are Estel Intel, Spleet, Vesper, among others.

The Third classification of PropTech started during the research of "PropTech 3.0: the future of real estate" by Andrew Brann (2017) in the SAID Business at Oxford University. One of the major foundations of the research was to explore the similarities between FinTech (Financial Technology) and PropTech Innovations and see how to improve PropTech by implementing ideas from FinTech's. This study bought above the evolution of Blockchain in the real estate sector. Blockchain is said to be a decentralized and secure ledger for recording digital transactions. It creates a system that is transparent and difficult to tamper with, as any attempt to alter a block would require altering all subsequent blocks. The incorporation of the secured and digital innovation of Blockchain to Property Finance is one of the great innovations of PropTech 3.0. Another Innovation of PropTech 3.0 is the importance of PropTech to Urban Planning, as similar Emerging Technologies like IOT, Smart Lifts, Drones, and Virtual Reality would be incorporated to develop more high-rise buildings for co-habitation of Properties Use. This wave includes having a property structure with multiple uses where all daily activities are been done within such property. PropTech 3.0 in Lagos is in the development stage as some start-ups are beginning to explore such opportunities.

Currently, the global real estate sector is witnessing a transformation with the new wave of PropTech 4.0 at the moment. It aims to leverage existing technologies to optimize structures and lower costs in the real estate sector. From planning and construction to the sale and purchase of properties, the industry is experiencing changes in multiple areas, in relation to the successive waves of PropTech and the capital invested in it.

2.3 PropTech Tools

The impact of PropTech in the real estate sector globally is focus on the various technological innovations/tools used by real estate professionals to solve their day-to-day activities. These

tools are developed based on the focus on the different classifications of PropTech (Aceable Incorporation, 2022) Examples of some of such tools are:

2.3.1 Drones

Drones have emerged as a valuable PropTech tool for property valuation, particularly within the PropTech 3.0 evolution. With their decreasing cost, drones are now accessible to mid-market real estate surveyors, providing a range of benefits. They offer an aerial perspective, capturing high-quality imagery, enabling enhanced property inspections, aerial mapping, and measurements. Drones provide unique data collection and analysis capabilities, including thermal readings and 3D modelling, which contribute to energy efficiency assessments and structural evaluations. Moreover, drones serve as a tool for showcasing properties to potential buyers, facilitating virtual neighbourhood tours and improving the overall real estate experience.

2.3.2 Virtual and Augmented Reality

Virtual Reality (VR) and Augmented Reality (AR) have emerged as indispensable components of PropTech in the Lagos real estate market, revolutionizing the way properties are marketed, experienced, and transacted. These cutting-edge technologies offer immersive and interactive experiences, empowering potential buyers to virtually explore properties and envision their potential.

The integration of VR in the real estate market enables the creation of captivating virtual property tours, where users can navigate through properties, examine intricate details, and gain a realistic sense of the space without the need for physical visits. This proves especially advantageous in situations where physical visits may be challenging, such as for international buyers or during times of restricted mobility, like the COVID-19 restrictions.

On the other hand, AR enhances the physical environment by overlaying digital information onto real-world surroundings. It finds application in property staging, where virtual furniture and decor are superimposed onto empty spaces, allowing potential buyers to envision the property's potential and make informed decisions. AR also facilitates on-site property inspections, as users can leverage their mobile devices to access additional information, view 3D models, or obtain real-time data about the property and its surroundings.

The adoption of VR and AR in the Lagos real estate market has revolutionized property marketing strategies and enhanced customer experiences. These transformative technologies have opened up new possibilities for remote property exploration, visualization, and decision-making, positioning PropTech as a game-changer in the modern real estate landscape.**2.3.3 Smart Home/IOT Tech**

IOT Technologies are tools that allow a homeowner to control things like clocks, thermostats, security cameras, and lights directly from their smartphone. This bought about the development of smart homes as houses are been decided for the confront of the occupier where they have access to control various parts of the house from their smartphone. An example of IOT is Alexa Amazons' high-tech assistant, amongst others.

This is also a growing market in the real estate sector as 75% of homeowners intend to spend more money on additional smart home technology for their residences.

2.3.4 AI Chatbot

Machine learning, a subset of artificial intelligence (AI), has brought about a revolutionary impact on the real estate sector, particularly within PropTech. A significant application of machine learning lies in the development of AI chatbots, which have greatly enhanced customer interactions and support. These chatbots employ machine learning algorithms to constantly improve their performance by analyzing data and user feedback. Incorporating

advanced language models like ChatGPT enables AI chatbots to generate human-like responses and engage in natural language conversations, delivering personalized and accurate information to clients. This seamless integration of machine learning and AI in PropTech empowers real estate professionals to provide round-the-clock support, elevate customer satisfaction, and streamline operations, ultimately enriching the overall real estate experience.

By leveraging sophisticated language models like ChatGPT, these chatbots can comprehend complex queries, learn from previous interactions, and deliver contextually relevant information. The continuous refinement of AI chatbots through machine learning fosters enhanced customer satisfaction, heightened responsiveness, and optimized processes within the real estate market. Overall, the fusion of machine learning and AI in PropTech holds the potential to revolutionize the industry by harnessing the power of technology to deliver efficient, personalized, and accessible real estate services.

2.3.5 Big Data and Predicting Analysis

Big data and predictive analysis stand as indispensable PropTech tools, offering substantial benefits to the real estate sector. With the exponential growth of data in the real estate market, harnessing big data and predictive analysis becomes paramount to extract valuable insights and facilitate informed decision-making. By leveraging the vast pool of structured and unstructured data, real estate professionals gain deeper comprehension of market dynamics, recognize patterns and trends, and derive data-driven predictions. This empowers them to forecast property prices, spot lucrative investment opportunities, and gauge market demand.

Incorporating big data and predictive analysis into the PropTech industry equips real estate professionals with more precise market predictions, optimized pricing strategies, targeted demographic identification, and streamlined operations. By analyzing historical sales data, market trends, and other pertinent factors, predictive models provide insights into the potential

profitability of real estate investments and steer decision-making processes. These cutting-edge technologies bestow a competitive edge on professionals in the market, enabling them to make data-informed choices and adapt swiftly to evolving market conditions. Consequently, the integration of big data and predictive analysis elevates operational efficiency, enhances customer experiences, and fosters innovation in the real estate domain.

2.3.6 Blockchain Technology

The integration of blockchain technology as a PropTech tool possesses immense potential to transform property transactions, enhance transparency, and overcome trust and security challenges (Seven Startup, 2020). Blockchain, functioning as a decentralized and immutable ledger, presents numerous advantages in the real estate domain. Powered by blockchain, smart contracts can automate and streamline the processes of property buying, selling, and ownership transfer, eliminating the need for intermediaries and reducing associated costs and delays. Utilizing blockchain guarantees that transaction records are securely stored and tamper-proof, instilling a higher level of trust and eradicating the risk of fraud.

Furthermore, blockchain can facilitate fractional ownership and property tokenization, granting individuals the opportunity to invest in real estate assets with increased flexibility and liquidity. Fractional ownership allows for property ownership division into smaller shares, making it more accessible to a broader array of investors. On the other hand, tokenization represents real estate assets as digital tokens on the blockchain, enabling seamless transfer, trading, and fractional investment in properties. By incorporating blockchain technology, the real estate industry can usher in a new era of efficiency, security, and accessibility in property transactions.

2.4 The Importance of PropTech

The goal of PropTech is to create technological tools that would be useful for the development of the real estate sector, and this tool is been developed with the aim of bringing into existence great importance to the real estate sector which includes:

2.4.1 Enhances the Property Buying and Selling Process

PropTech makes it possible for buyers and sellers to instantly access and exchange information. For instance, a large database of houses for sale is made available by online real estate websites, making it simpler for buyers to select their dream home. Using virtual reality technology, purchasers may tour properties virtually while relaxing in their own homes, saving them time and travel expenses.

2.4.2 Improves Transparency and Accuracy

PropTech provides real estate agents and property managers with access to real-time data and analytics, making it easier to make informed decisions. For example, blockchain technology enables secure and transparent transactions, reducing the risk of fraud and ensuring the accuracy of property records.

2.4.3 Increases Efficiency

Real-time data and analytics are made available to real estate brokers and property managers through PropTech, making it simpler to make decisions. Blockchain technology, for instance, provides safe and open transactions, lowering the possibility of fraud and guaranteeing the veracity of property records.

2.4.4 Supports Sustainable Development

PropTech has the potential to encourage sustainable real estate development. For instance, smart building technology gives facility managers the capacity to monitor and manage energy use, which cuts down on waste and encourages sustainability.

2.4.5 Provides New Opportunities for Growth

The real estate sector is experiencing new development potential thanks to PropTech, which is allowing businesses to enter new markets and provide new services. For instance, real estate developers can construct virtual tours of their projects using virtual reality technology, which increases visibility and draws in new investors.

2.5 The Impact of PropTech in Nigeria

PropTech innovation first appeared in the early 2000s, and in the most recent few years, its use (and usefulness) has substantially increased. Additionally, it made it feasible for the industry to collapse under its own weight during the Covid-19 outbreak when carrying out transactions through standard channels was virtually impossible: PropTech made it simpler for sales to not only continue but to explode in ways we'd never imagined before when sellers could no longer simply list a house with an agent, wait for potential buyers to arrive either with their own agents or via open houses, make offers, and close sales all face-to-face (Shapiro, 2022)

2.5.1 The Impact of PropTech on the Real Estate Sector

In the past, it was typical to discover considerable usage of Excel-style spreadsheets to manage data, but this method lacked the industry-wide interconnection that is essential for maximizing system efficiency and streamlining and speeding up the process.

Currently, it is evident that PropTech businesses have achieved significant success in optimizing processes and enhancing productivity within an industry that has traditionally seen

limited transformative changes over the years. The seamless integration of data across various stages of the transaction process has played a pivotal role in driving this positive trend, and it is anticipated that the momentum will persist in the foreseeable future.

2.5.2 The Impact of PropTech on Real Estate Customers

Recently, the effects of PropTech in the commercial and multifamily sectors are of great impact to the environment as even people with no interest in it, stumble upon such a great development. Online platforms were the most significant way that PropTech innovation changed the process for buyers and sellers because in the fraction of a second, it took to conduct a search, people could find a wealth of information about properties in their localities, across the nation, and around the world.

The pandemic that followed saw purchasers and renters scrambling to find homes outside of their current home bases. They provided online offerings and video tours. They also competed, outbid one another, and concluded purchases online. The development of "buying," which moved the entire procedure online, resulted from this. In my opinion, sellers were the real winners when it came to PropTech advancements in a booming market.

2.5.3 The Impact of PropTech on Real Estate Investors

For real estate investors, PropTech aims to streamline the procedure, boost efficiency, and ultimately boost profits. The renting procedure, including applications, approvals, rent collection, and property management, must also be made simpler.

PropTech development has, overall, greatly benefited the real estate industry, as numerous owners and property-management firms will confirm. However, since humans are the intended consumers of their goods and services, there will always be drawbacks in addition to benefits. As a result, it is clear that PropTech is developing quickly and that its efficiency will probably continue to spur profitability, opportunity, and innovation.

2.6 Adoption of PropTech in Nigeria

The adoption of PropTech in Nigeria has grown to over 59 start-ups as of 2023 (Estate Intel, 2019). These start-ups have created solutions for solving Property Listing, Short Let apartments, Building and Construction, Property and Community management, Investment and Finance, and Data and Analytics.

In a survey conducted by KPMG Global PropTech survey, it was found that 97% of respondents recognized the influence of technological and digital innovation on their firms. However, only 30% of traditional real estate companies have invested in or have plans to invest in PropTech start-ups. This indicates the existence of a gap in enterprise-wide digital strategies within many organizations, while also presenting exciting opportunities for engaging with and implementing property innovation in the coming years.

According to unisuu, global venture capital reached $255 billion in 2018 with global PropTech funding coming in at $14.85 billion (5.8%). The African PropTech rate of growth pales in comparison to that of the continent's other thriving businesses or FinTech. There may be fewer investors interested in the industry, but there are also a lot fewer business owners with concepts or operations ready to receive structured financing as a total number of 5 PropTech companies in Nigeria have begun to get global recognition and investors (Estate Intel, 2019)

2.7 Review of Related Study

A comprehensive review of related studies on the topic is a crucial aspect of conducting a research study. It provides a platform to understand the existing knowledge on the subject matter and the gap that the research aims to fill. This section provides a review of relevant studies that have been conducted in the past on the potential of PropTech in unlocking real estate market opportunities in Lagos, Nigeria.

The first relevant study was carried out by (Olatunji, 2019) who examined the potential of PropTech for enhancing the real estate industry in Nigeria. The study found that the application of technology in the real estate industry can lead to improved productivity and efficiency, as well as better customer service. The study concluded that there is a growing interest in PropTech in Nigeria and that it has the potential to revolutionize the real estate industry.

Another researcher (Adekoya, 2021) also examined the impact of PropTech on the real estate industry in Lagos, Nigeria, and did another relevant study in this area. According to the study, the entrance of PropTech has significantly altered many aspects of the real estate market, specifically how homes are purchased and sold. The research also revealed that PropTech has the potential to improve the accountability and openness of real estate deals in Lagos, Nigeria.

In conclusion, the review of related studies highlights the importance of PropTech in unlocking real estate market opportunities in Lagos, Nigeria.

PropTech has the potential to change the real estate sector and result in major gains in customer satisfaction, efficiency, and production.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Preamble

This chapter entails an express discussion of the method adopted in fulfilling the aim of this study. It entails the explanation of the methodology used to achieve the stated aim and objectives of this study. Also, data requirement, study population, sample frame, sampling size, method of sampling, sources of data collection, method of data collection, presentation and analysis was expressed herein.

3.2 Data Required

The data required for this study entails users' data from PropTech start-ups in Lagos. This information was gathered with respect to the following objectives: to ascertain the extent of the adoption of PropTech in the Lagos real estate market; to ascertain the adoption and utilization of PropTech in the Lagos real estate market; to evaluate perceptions, and challenges of utilizing PropTech in Lagos real estate; to evaluate perceptions, and future prospects of PropTech in Lagos, Nigeria.

3.3 Study Population

Population refers to the group of people who live or reside inside a geographic or political area or limit. It might also refer to a group of people who will be monitored while engaging in a specific subject or investigation. The research's study population will consist of a total number of PropTech Startups who are registered within Lagos, Nigeria, in order to gather data for better representation.

3.4 Sampling Frame

The sampling Frame refers to the total number of population components that can be drawn from a specific study population to create an authentic list. There are currently 37 PropTech Start-ups in Lagos, Nigeria, (Tracxn Technologies Limited, 2023). Accordingly, this number served as the sampling frame for the study population.

3.5 Sample Size

Sample size is regarded as a specific proportion of sample frame from which the required data will be collected. It is a statistical process of selecting from the sample frame, a set of representative units that will adequately reflect the characteristics of the target population.

3.6 Sampling Techniques

Given sample size of 37 PropTech startups was selected for the study. This approach aligns with the total enumeration sampling method because this approach is appropriate as the PropTech industry is still in its early stages of adoption, with a limited number of firms available, the total enumeration sampling method involves including all the available entities in the population, ensuring comprehensive coverage of the PropTech startup landscape.

3.7   Sources of data collection

For the purpose of this study, the data were sourced through both primary and secondary sources.

3.7.1   Primary Data

The primary data for this study were collected directly from PropTech users in the study area using well-structured online questionnaires. These questionnaires aimed to gather firsthand information on the adoption, utilization, perceptions, and challenges related to PropTech in the Lagos real estate market.

3.7.2   Secondary Data

Secondary data for this study were sourced from various reliable and authoritative references, such as research papers, academic journals, government reports, policies, industry reports, online databases, websites, and news articles. These sources provided valuable second-hand information, contributing to the depth and credibility of the research work.

3.8 Method of Data Collection

The method of data collection for this project topic includes both primary and secondary data sources. For primary data collection, a well-structured online questionnaire was administered to users of PropTech in the Lagos real estate market. The questionnaire aimed to gather firsthand information on the adoption, utilization, perception, and challenges related to PropTech in the study area. The respondents consisted of real estate professionals, industry stakeholders, and other relevant users of PropTech tools.

Additionally, secondary data was obtained from various reputable sources such as research papers, academic journals, government reports, policies, industry reports, online databases, websites, and news articles. These secondary data sources provided valuable insights and context to complement the primary data, enhancing the comprehensiveness and credibility of the research findings.

The combination of primary and secondary data collection methods allows for a comprehensive exploration of the potential and impact of PropTech in the Lagos real estate market, providing a robust foundation for the research study.

3.9 Method of Data Analysis and Presentation

The overall data gathered during the online survey were analysed with the aid Microsoft Excel, 2019. Explicitly, the table 3.1 below shows the method of analysis in line with objectives, data requirement and method of data requirement

Table 3.1 Method of Data Analysis

Objective	Data Requirement	Data Measurement	Data Analysis
To ascertain the socio-economic features of users of PropTech in Lagos Real Estate Market	Gender, Location of PropTech Organization, Current Role, Work Experience, PropTech Revolution Utilized.	Nominal and Ratio Scale in respect to appropriate questions	Frequency and percentage distributions
To assess the adoption and utilization of PropTech in the Lagos real estate market	Year ad Medium of PropTech awareness, and tools utilized,	Nominal, Ratio and Rating Scale in respect to appropriate questions	Relative Importance Index, Frequency, percentage distributions, and
To evaluate perceptions, and challenges of utilizing PropTech in Lagos real estate.	Level of PropTech Adoption, Influence of PropTech and Factors Influencing PropTech, challenges and problems associated with the use of PropTech in the study area	Nominal, Ratio and Rating Scale in respect to appropriate questions	Mean, Standard Deviation, Relative Importance Index Frequency, and percentage distributions
To evaluate the perceptions and future prospect of PropTech in Lagos real estate market.	Potential Benefit and Growth of PropTech, and Unadopted Beneficial PropTech Tools	Nominal, Ratio and Rating Scale in respect to appropriate questions	Mean, Standard Deviation, Frequency, and percentage distributions

3.9.1 Relative Importance Index

To employ the Relative Importance Index (RII) method, a set of factors or indicators were evaluated using a 5-point Likert scale to gauge their significance. The Likert scale allowed respondents to rate each indicator based on their level of agreement or satisfaction. Subsequently, the RII was calculated for each factor to determine their respective ranks.

The RII formula is expressed as follows:

$$RII = \Sigma W / (A * N)$$

Where:

ΣW = Sum of weighting given to each factor by respondents

A = Highest weight on the Likert scale (in this case, 5)

N = Total number of respondents

n_1 = Frequency of respondents who answered " Very Low Importance"

n_2 = Frequency of respondents who answered " Low Importance"

n_3 = Frequency of respondents who answered "Moderate Importance"

n_4 = Frequency of respondents who answered " High Importance"

n_5 = Frequency of respondents who answered " Very High Importance"

By applying the RII method, the factors were ranked based on their average weights, reflecting their relative importance according to the perceptions of the respondents.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION OF RESULTS

4.1 Preamble

This chapter aims to analyse, present, and interpret the data collected from the online survey through a google form questionnaire made accessible to users of PropTech in the study area. The presentation of data is systematically linked to the format of the self-developed questionnaires attached in the appendix. The objective of this chapter was to obtain the perspectives of users of PropTech within the study area. The specific objectives include: to ascertain the adoption and utilization of PropTech in the Lagos real estate market; to evaluate perceptions, and challenges of utilizing PropTech in Lagos real estate; to evaluate the future prospect of PropTech in Lagos.

4.1.1 Analysis of Response Rate

The online survey for data collection in this study was available to users of PropTech in the study area from June 24, 2023, to July 07, 2023. The response rate is depicted in Table 4.1. The questionnaire aimed to gather responses from 37 participants, and once this target was reached, the online questionnaire was closed from further responses as analyse on the response began, achieving a 100% response rate as anticipated.

Table 4.2: Analysis of Administered Questionnaires

Respondent(S)	Number Of Response	Number Of Valid Response	Percentage Of Response (%)
Users of PropTech	37	37	100%

Source: Online Survey (2023)

This rate of response is however considered reasonable for the study as it represents the total sample population of the total population as referenced by an article created by Tracxn Technologies Limited in 2023.

The analytical package for Microsoft Excel, 2019 was used to analyse the data, while the method employed for analysing the data were frequency, mean scores, and standard deviation.

4.2 Socio-Economic Features of PropTech Users

The users of PropTech in the study area were asked to provide data on their socio-economic features in other to get a perceptive as to the demographics. The profile was designed to capture Gender, Location of PropTech Organization, Current Role, Work Experience, PropTech Revolution Utilized. All these were put together, analysed and presented in Table 4.2. 4.3, 4.4, 4.5, 4.6 as follows:

Table 4.2: Gender of Respondents

Gender	Frequency	Percentage
Female	10	27.03%
Male	27	72.97%
Grand Total	**37**	**100.00%**

Source: Online Survey (2023)

The data presented in Table 4.2 provides insights into the gender distribution among the respondents. The findings reveal that 27.03% of the respondents identified as female, while the majority, accounting for 72.97%, identified as male. These results indicate that, at the time of the research, there is a higher proportion of male respondents actively utilizing various PropTech tools available to them. This observation may be attributed to several factors, such as the prevailing gender demographics within the PropTech industry or differences in the level of engagement and adoption among genders.

Table 4.3: Location of Respondents

Location	Frequency	Percentage
Alimosho	1	2.70%
Eti-Osa	9	24.32%
Ikeja	6	16.22%
Lagos Island	16	43.24%
Lagos Mainland	5	13.51%
Grand Total	**37**	**100.00%**

Source: Online Survey (2023)

The geographic distribution of respondents is outlined in Table 4.3, providing insights into their location-specific representation. The findings reveal that among the participants surveyed, the highest percentage (43.24%) originated from Lagos Island. Eti-Osa accounted for 24.32% of the respondents, while Ikeja comprised 16.22% of the sample. Lagos Mainland exhibited a representation of 13.51%, whereas Alimosho demonstrated the lowest percentage at 2.70%. These outcomes indicate a concentration of respondents within the Lagos Island area.

The divergent distribution of respondents across different locations suggests potential variations in the adoption and utilization of PropTech tools influenced by geographic factors such as accessibility, market dynamics, and industry presence. Furthermore, the results establish that the active presence of PropTech is predominantly observed in 5 LGA. This spatial analysis provides valuable insights into the localized utilization patterns and potential opportunities for PropTech integration within the Lagos real estate market.

Table 4.4: Title/Role of Respondents

Title/Role	Frequency	Percentage
Business Development Manager	2	5.41%
Business development trainee	1	2.70%
CEO	6	16.22%
Chief Technical officer	1	2.70%
Co-founder	1	2.70%

COO	1	2.70%
Customer Success Manager	2	5.41%
Data Analyst/Scientist	3	8.11%
Founder/CEO	1	2.70%
Marketing Manager	3	8.11%
Operations Manager	3	8.11%
Product Manager	4	10.81%
Property manager	1	2.70%
Research Analyst	1	2.70%
Research and Data Analyst	1	2.70%
Research Team Lead	1	2.70%
Sales Executive/Manager	2	5.41%
Software Engineer/Developer	3	8.11%
Grand Total	**37**	**100.00%**

Source: Online Survey (2023)

The distribution of respondents based on their title/role is summarized in Table 4.4. The findings reveal that among the surveyed participants, the most common role is C.E.O (Chief Executive Officer), accounting for 16.22% of the respondents. Product Managers constituted 10.81%, while Data Analysts/Scientists, Marketing Managers, and Operations Managers each represented 8.11% of the respondents. Other roles, such as Business Development Manager, Customer Success Manager, and Software Engineer/Developer, were also represented to varying degrees.

These results indicate the diverse range of roles within the PropTech industry among the respondents. The presence of CEOs and Product Managers suggests the involvement of decision-makers and individuals responsible for driving innovation and business development of PropTech in the study area. The presence of Data Analysts/Scientists and Software Engineers/Developers underscores the importance of data analytics and technology in the field.

Table 4.5: Year of Experience of Respondents

Years of Experience	Frequency	Percentage
10-15	1	2.70%
1-5	27	72.97%
5-10	9	24.32%
Grand Total	**37**	**100.00%**

Source: Online Survey (2023)

The distribution of respondents based on their years of experience is outlined in Table 4.5. The findings indicate that among the surveyed participants, the highest percentage, 72.97%, reported having 1-5 years of experience in the field. The next significant group consisted of respondents with 5-10 years of experience, representing 24.32% of the total. Only one respondent, accounting for 2.70%, reported having 10-15 years of experience.

These results highlight the predominance of early-career professionals within the PropTech industry in the study area. The majority of respondents reported having 1-5 years of experience, indicating a relatively young workforce actively involved in utilizing PropTech tools. This suggests that the adoption of PropTech is still in its early stages, with newer professionals bringing fresh perspectives and adaptability to the industry. The presence of a younger workforce indicates a growing interest and engagement in PropTech, with professionals who are more receptive to technological advancements and open to exploring innovative solutions in the Lagos real estate market.

Table 4.6: PropTech Revolution

PropTech Revolution	Frequency	Percentage
PROPTECH 1.0 (Digitized Real Estate Listings and Transactions.)	15	35.71%
PROPTECH 2.0 (Efficient operations and Smart Building management.)	6	14.29%
PROPTECH 3.0 (Smart, Sustainable, and Personalized Real estate)	6	14.29%
PROPTECH 4.0 (Integrating Emerging Technologies for Better Real Estate Experiences)	15	35.71%
Grand Total	**42**	**100.00%**

Source: Online Survey (2023)

The distribution of respondents based on the revolution of PropTech tools utilized is summarized in Table 4.6. The results demonstrate that respondents had the option to select multiple PropTech revolutions, indicating that some individuals utilize PropTech tool from more than one revolution of PropTech.

Among the respondents, 35.71% identified with the usage of tools from PROPTECH 1.0 (Digitized Real Estate Listings and Transactions), while an equal percentage (35.71%) selected PROPTECH 4.0 (Integrating Emerging Technologies for Better Real Estate Experiences). PROPTECH 2.0 (Efficient Operations and Smart Building Management) and PROPTECH 3.0 (Smart, Sustainable, and Personalized Real Estate) were each chosen by 14.29% of the respondents.

The results reflect the respondents' recognition and acceptance of multiple PropTech revolutions, indicating the adoption of all four revolutions within the study area. This demonstrates that real estate professionals in the region are actively incorporating various PropTech innovations into their practices, leveraging the dynamic nature of the industry and the diverse range of available technologies. Embracing multiple PropTech revolutions allows professionals to capitalize on the unique advantages and potential benefits offered by each revolution. By doing so, they can optimize their operations, improve efficiency, integrate sustainability practices, and leverage emerging technologies to enhance the overall real estate experience.

4.3 The Adoption and Utilization of PropTech in the Lagos Real Estate Market.

This section focuses on achieving the primary objective of the study, which is to assess the adoption and utilization of PropTech in the Lagos real estate market. Through specific inquiries regarding PropTech awareness, tools utilized, and adoption, respondents have provided valuable insights. By analysing this data, it aims to provide a comprehensive assessment of

PropTech adoption in the Lagos real estate market, shedding light on its current status and utilization. Detailed responses to these questions can be found in Tables 4.7, 4.8, 4.9 and 4.10.

Table 4.7: Year of Awareness

Year of Awareness	Frequency	Percentage
2013	1	2.70%
2014	2	5.41%
2016	3	8.11%
2017	4	10.81%
2018	7	18.92%
2019	4	10.81%
2020	6	16.22%
2021	8	21.62%
2022	2	5.40%
Grand Total	37	100.00%

Source: Online Survey (2023)

Table 4.7 presents the distribution of respondents based on their year of awareness regarding PropTech. The results highlight the percentage distribution of awareness across different years among the respondents. The data indicates that awareness of PropTech has evolved over time among the respondents. The highest percentage of awareness occurred in 2021, with 21.62% of the respondents indicating that they became aware of PropTech during that year. This was closely followed by 2018, with 18.92% of the respondents reporting their awareness. Other notable years of awareness include 2020 (16.22%) and 2017 (10.81%).

The results indicate a progressive rise in PropTech awareness over the past years, particularly with a notable surge observed between 2018 and 2021. This trend signifies an increasing acknowledgment and adoption of PropTech solutions within the Lagos real estate market.

Table 4.8: Medium of Awareness

How did you know about PropTech	Frequency	Percentage
By building a PropTech solution	1	2.70%
Research	1	2.70%
Through educational institutions or training programs	2	5.41%
Through industry events or conferences	7	18.92%
Through online sources (websites, blogs, social media)	14	37.84%
Through professional networks or associations	8	21.62%
Through word-of-mouth recommendations	4	10.81%
Grand Total	**37**	**100.00%**

Source: Online Survey (2023)

Table 4.8 examines the various sources through which respondents became aware of PropTech, providing insights into the adoption of PropTech in Lagos. Among the respondents, the most prevalent source of PropTech awareness was through online sources, including websites, blogs, and social media, with 37.84% of respondents indicating this as their source of knowledge. This was followed by industry events or conferences, accounting for 18.92% of respondents. Professional networks or associations also played a significant role, with 21.62% of respondents acquiring awareness through this channel. Other sources of PropTech awareness included educational institutions or training programs (5.41%), word-of-mouth recommendations (10.81%), research (2.70%), and building a PropTech solution (2.70%).

This signifies the diverse range of channels through which respondents gained awareness of PropTech in Lagos. Online sources, industry events, and professional networks emerged as the primary means of acquiring knowledge in the study area. It also indicates a growing presence and influence of digital platforms, industry networking, and knowledge-sharing opportunities in fostering the adoption of PropTech in the real estate market of Lagos.

Table 4.9: PropTech Tools Utilized

PropTech Tools	Percentage	Weight	Weighted Average	Relative Important Index	Ranking
Blockchain-based property transactions	1.96%	4	0.0008	0.0179	7th
Customer Relationship Management (CRM)	10.78%	3	0.0032	0.0740	5th
Data analytics for market insights	17.65%	4	0.0071	0.1614	3rd
Digital Payment Solutions	14.71%	5	0.0074	0.1682	2nd
Online Listing and Rental Platforms	32.35%	5	0.0162	0.3700	1st
Property Management Software (PMS)	11.76%	5	0.0059	0.1345	4th
Virtual reality property tours	10.78%	3	0.0032	0.0740	5th
Grand Total	**100.00%**		**0.0437**		

Source: Online Survey (2023)

Table 4.9 presents the results of the analysis on the relative importance of different PropTech tools in the Lagos real estate market. The percentage column represents the proportion of respondents who indicated the utilization of each tool. The weight column assigns a weight to each tool based on its importance, with a higher weight indicating higher significance. The weighted average column shows the product of the percentage and weight for each tool, indicating its relative importance.

The Relative Importance Index (RII) is then calculated for each tool by summing up the weighted averages and dividing by the total weight. The RII provides a measure of the relative importance of each tool in comparison to others. The tools are ranked based on their RII values, with higher values indicating higher ranks.

From the analysis, the most impactful PropTech tool in the Lagos real estate market is "Online Listing and Rental Platforms," with an RII of 0.3700, ranking first. "Digital Payment Solutions" and "Data analytics for market insights" follow closely, ranking second and third, respectively, with RII values of 0.1682 and 0.1614. "Customer Relationship Management (CRM)" and "Property Management Software (PMS)" share the fifth rank with an RII of 0.0740.

"Blockchain-based property transactions" and "Virtual reality property tours" have the lowest RII values and rank seventh.

These findings offer valuable insights for real estate practitioners and stakeholders in the Lagos market to prioritize the adoption and utilization of PropTech tools that have demonstrated higher relative importance. It aids in strategic decision-making and resource allocation to enhance operational efficiency and overall performance in the real estate sector.

Table 4.10: Most Utilized PropTech Tools

Utilized PropTech Tool	Percentage	Weight	Weighted Average	Relative Important Index	Ranking
Blockchain-based property transactions	2.70%	4	0.0011	0.0242	6th
co-ownership platforms/fractional ownership	2.70%	3	0.0008	0.0182	7th
Customer Relationship Management (CRM)	2.70%	3	0.0008	0.0182	7th
Data analytics for market insights	21.62%	4	0.0086	0.1939	3rd
Digital Payment Solutions	5.41%	5	0.0027	0.0606	4th
On-demand service	2.70%	2	0.0005	0.0121	9th
Online Listing and Rental Platforms	37.84%	5	0.0189	0.4242	1st
Property Management Software (PMS)	18.92%	5	0.0095	0.2121	2nd
Virtual reality property tours	5.41%	3	0.0016	0.0364	5th
Grand Total	**100.00%**		**0.0446**		

Source: Online Survey (2023)

The table presents the results of the analysis on the relative importance of different PropTech tools utilized in the Lagos real estate market. Each tool is represented by its percentage, indicating the proportion of respondents who indicated its utilization. The weight column assigns a weight to each tool based on its importance, with a higher weight indicating higher significance. The weighted average column shows the product of the percentage and weight for each tool, reflecting its relative importance.

The Relative Importance Index (RII) is then calculated for each tool by summing up the weighted averages and dividing by the total weight. The RII provides a measure of the relative

importance of each tool compared to others. The tools are ranked based on their RII values, with higher values indicating higher ranks.

According to the analysis, "Online Listing and Rental Platforms" emerge as the most utilized and impactful PropTech tool in the Lagos real estate market, ranking first with an RII of 0.4242. "Property Management Software (PMS)" follows closely, ranking second with an RII of 0.2121. "Data analytics for market insights" secures the third rank with an RII of 0.1939. "Digital Payment Solutions" and "Virtual reality property tours" occupy the fourth and fifth ranks, respectively, with RII values of 0.0606 and 0.0364. "Blockchain-based property transactions," "co-ownership platforms/fractional ownership," and "Customer Relationship Management (CRM)" share the sixth and seventh ranks with the same RII value of 0.0182. "On-demand service" takes the ninth rank with an RII of 0.0121.

These findings offer valuable insights for real estate professionals and stakeholders in the Lagos market to understand the significance of each PropTech tool utilized. It can inform decision-making, strategic planning, and resource allocation to optimize real estate operations and improve customer experiences through the adoption of high-impact PropTech tools.

4.4 The Perception and Challenges of Utilizing PropTech in the Lagos Real Estate Market.

This section addresses the second objective of the study: to explore the perception and challenges of utilizing PropTech in the Lagos real estate market. Through specific questions on PropTech perception, challenges faced, influencing factors and experiences, respondents provided valuable insights. By analysing this data, the study aims to provide a comprehensive understanding of the perception and challenges associated with utilizing PropTech in the Lagos real estate market. Detailed responses to these questions can be found in Tables 4.11, 4.12, 4.13, 4.14 and 4.15.

Table 4.11: Level of PropTech Adoption in Lagos Real Estate Market

Perceived Level of Adoption	Frequency	Percentage
25% to 50%	11	29.73%
51% to 75%	3	8.11%
Less than 25%	22	59.46%
More than 75%	1	2.70%
Grand Total	**37**	**100.00%**

Source: Online Survey (2023)

The data presented in Table 4.11 illustrates the perceived level of adoption of PropTech among respondents in the study area. The results show that the majority of respondents, accounting for 59.46%, believe that less than 25% of real estate professionals in Lagos actively adopt PropTech solutions. Additionally, 29.73% of respondents estimate the adoption level to be between 25% and 50%. A smaller percentage, 8.11%, believe the adoption level falls within the range of 51% to 75%. Only one respondent, representing 2.70%, perceives the adoption level to be more than 75%. These results provide valuable insights into the perceived extent of PropTech adoption in the Lagos real estate market as assessed by the respondents.

Table 4.12: Influenced of PropTech in Lagos Real Estate Market

	Range	Mean	Standard Deviation
Influence of PropTech	4	3.56757	0.754823786

Source: Online Survey (2023)

The analysis of the survey data indicates that the respondents perceive the influence of PropTech in the Lagos real estate market to be high. On a scale of 1 to 4, with 4 representing the highest level of influence, the mean score obtained was 3.56757, with a standard deviation of 0.754823786. This suggests that PropTech is widely recognized and considered to have a significant impact on the real estate industry in Lagos. The findings highlight the positive

perception of respondents towards the role of PropTech in shaping the future of the real estate market in the region.

Table 4.13: Factors Influencing PropTech Adoption in Lagos

Factors	Frequency	Weight	Weighted Average	Relative Important Index	Ranking
Changing consumer preferences	16.96%	5	0.0085	0.2030	2th
Collaboration and partnerships within the industry	12.50%	5	0.0063	0.1496	3th
Cost-effectiveness and efficiency benefits	14.29%	4	0.0057	0.1368	4th
Fundraising activity	0.89%	4	0.0004	0.0085	8th
Government support and regulations	3.57%	3	0.0011	0.0256	7th
Improved access to property data and analytics	12.50%	3	0.0038	0.0897	6th
Improvement in quality of solutions launched	0.89%	4	0.0004	0.0085	8th
More media attention to start ups across board	0.89%	3	0.0003	0.0064	10th
Real estate industry demands	15.18%	3	0.0046	0.1090	5th
Technological advancements	21.43%	5	0.0107	0.2564	1th
The accelerated and compulsory change from the effects of COVID-19	0.89%	3	0.0003	0.0064	10th
Grand Total	**100.00%**		**0.0418**		

Source: Online Survey (2023)

The research study investigated the factors influencing PropTech adoption in the Lagos real estate market. A total of eleven factors were examined, and their relative importance was determined through a weighted average and Relative Importance Index (RII). The results revealed that technological advancements had the highest relative importance, ranking first with a RII of 0.2564 and a weight of 5. This underscores the significance of embracing and leveraging the latest technological innovations to drive PropTech growth and efficiency in the real estate sector.

Changing consumer preferences emerged as the second most influential factor, with a RII of 0.2030 and a weight of 5. This highlights the importance of aligning PropTech solutions with evolving consumer needs and preferences to ensure widespread adoption and success. Collaboration and partnerships within the industry were ranked third, with a RII of 0.1496 and

a weight of 5, indicating that strategic alliances and cooperative efforts can foster PropTech advancement and market penetration.

Cost-effectiveness and efficiency benefits, along with real estate industry demands, were also deemed significant factors, ranking fourth and fifth, respectively. These findings emphasize the need for cost-efficient solutions that address specific industry demands to drive PropTech adoption and utilization.

Other factors, such as government support and regulations, improved access to property data and analytics, fundraising activity, improvement in solution quality, media attention to start-ups, and the impact of COVID-19, were considered, though currently holding lower relative importance in the context of PropTech adoption in Lagos.

The findings provide valuable insights for industry stakeholders, policymakers, and real estate professionals, enabling them to focus on key drivers and factors that will lead to successful PropTech integration and sustainable growth in the dynamic Lagos real estate market.

Table 4.14: Challenges Faced using PropTech in the Lagos Real Estate Market

Challenges	Frequency	Percentage	Ranking
Adaptation to the real estate sector	1	2.70%	7th
All of the above	1	2.70%	7th
Cost of implementation	8	21.62%	3rd
Integration with existing systems	9	24.32%	2nd
N/A	2	5.41%	6th
Resistance to change by staff	3	8.11%	4th
Technical challenges	10	27.03%	1st
Training staff on how to use the new technology	3	8.11%	4th
Grand Total	**37**	**100.00%**	

Source: Online Survey (2023)

The analysis of the survey responses reveals several challenges associated with the utilization of PropTech in the Lagos real estate market. The most prevalent challenge reported by the respondents is the technical challenges faced in implementing PropTech, accounting for 27.03%of the responses. This is followed by integration with existing systems, with 24.32% of the respondents citing it as a significant challenge. Cost of implementation is also prominent, with 21.62% of the respondents identifying it as an obstacle. Other challenges mentioned include adaptation to the real estate sector, resistance to change by staff, and the need for training staff on how to use the new technology. It is worth noting that some respondents selected all the challenges listed in table 4.13. These results highlight the diverse challenges faced in the adoption and implementation of PropTech in the Lagos real estate market.

Table 4.15: Problems associated with the use PropTech in the Lagos Real Estate Market

Problems	Percentage	Weight	Weighted Average	Relative Importance Index	Ranking
Limited access to funding and investment opportunities for PropTech ventures	25.26%	4	0.0101	0.2341	1th
Limited awareness and understanding of PropTech solutions among potential clients.	15.79%	5	0.0079	0.1829	4th
Regulatory challenges and lack of supportive policies for PropTech startups.	20.00%	4	0.0080	0.1854	3th
Resistance to change and reluctance to adopt new technologies in the real estate sector.	23.16%	4	0.0093	0.2146	2th
Talent shortage and lack of skilled professionals with expertise in PropTech	15.79%	5	0.0079	0.1829	4th
Grand Total	**100.00%**		**0.0432**		

Source: Online Survey (2023)

The data presented in Table 4.15 examined the problems hindering the adoption of PropTech in the Lagos real estate market. Five key problems were identified and their relative importance was determined through a weighted average and Relative Importance Index (RII).

Limited access to funding and investment opportunities for PropTech ventures emerged as the most significant disadvantage, ranking first with a RII of 0.2341 and a weight of 4. This

highlights the critical need for increased financial support and investment avenues to foster the growth and sustainability of PropTech startups in the market.

Resistance to change and reluctance to adopt new technologies in the real estate sector ranked second, with a RII of 0.2146 and a weight of 4. This indicates the importance of overcoming resistance and promoting a culture of innovation and openness to new technological solutions within the industry

Regulatory challenges and lack of supportive policies for PropTech startups were ranked third, with a RII of 0.1854 and a weight of 4. This emphasizes the necessity for clear and supportive policies that create a conducive environment for PropTech ventures to thrive.

Limited awareness and understanding of PropTech solutions among potential clients, as well as talent shortage and lack of skilled professionals with expertise in PropTech, tied for fourth place. Both factors had a RII of 0.1829 and a weight of 5. This underscores the significance of raising awareness and knowledge about the benefits and applications of PropTech and addressing the shortage of skilled professionals in the field.

The study's findings shed light on the key challenges facing PropTech adoption in the Lagos real estate market, providing valuable insights for stakeholders to address these disadvantages and promote the effective integration and utilization of PropTech solutions.

4.5 The Future Prospects of PropTech in the Lagos Real Estate Market

This section focuses on achieving the third objective of the study, which is to evaluate the perceptions and future prospects of PropTech in Lagos, Nigeria. Through detailed analysis of the potential benefits and anticipated growth of PropTech in the coming years, respondents provided valuable insights. The aim of this section is to offer a comprehensive understanding of how PropTech is perceived and its potential for the future development of the Lagos real estate market. By analysing the data collected, the study aims to shed light on the opportunities

and possibilities that PropTech holds for transforming the real estate industry in Lagos. Detailed responses to these questions can be found in Tables 4.16, 4.17, and 4.18.

Table 4.16: Potential Benefit of PropTech in the Lagos Real Estate Market

	Range	Mean	Standard Deviation
Benefit of PropTech	10	8.5676	1.2849

Source: Online Survey (2023)

The analysis of the benefit of PropTech reveals a range of 10, indicating a wide variation in the perceived benefits among the respondents. The mean score of 8.5676 suggests that, on average, the respondents recognize PropTech as highly beneficial in the Lagos real estate market. The standard deviation of 1.2849 indicates a moderate level of dispersion around the mean, implying some variation in the perception of the benefits of PropTech among the respondents. Overall, the analysis highlights the positive perception and recognition of the benefits that PropTech brings to the real estate market in Lagos.

Table 4.17: Potential Growth of PropTech in the Lagos Real Estate Market

	Range	Mean	Standard Deviation
Potential Growth of PropTech	5	3.1081	0.9237

Source: Online Survey (2023)

The analysis of the survey data indicates that the respondents perceive the growth of PropTech in the Lagos real estate market to be high. On a scale of 1 to 5, with 5 representing the highest level of influence, the mean score obtained for the growth of PropTech is 3.10811, with a standard deviation of 0.923676081. The relatively high mean score indicates a positive perception of the growth potential of PropTech in the real estate industry in Lagos. The standard deviation reflects the level of variation in the responses, suggesting some degree of diversity in the perceptions of respondents regarding the growth of PropTech.

Table 4.18: Unadopted Beneficial PropTech Tool in the Lagos Real Estate Market

Unadopted Beneficial PropTech	Frequency
A PropTech tool for property valuation	1
affordable integrations to enable growth of consumers	1
Artificial Intelligence	2
Data analytics driven marketing	1
Digitalized listings and inspections	3
Facility management	1
Improved Data Management	1
More Digitalization especially of current and historical transaction data in the real estate market.	1
More seamless property management systems	1
Mortgage	2
On-demand services for building	1
Partnerships	1
PropTech enabling Timeshares Property	1
Real estate Tokenization/Blockchain	6
virtual reality property tours	3
We need a platform where one can easily go to and get a technician/ artisan	1
None for None	10
Grand Total	**37**

Source: Online Survey (2023)

The analysis of unadopted beneficial PropTech tools reveals a diverse range of tools that respondents believe could bring benefits to the Lagos real estate market but have yet to be widely adopted. These tools include a PropTech tool for property valuation, affordable integrations for consumer growth, artificial intelligence, data analytics-driven marketing, digitalized listings and inspections, facility management, improved data management, seamless property management systems, mortgage solutions, on-demand services for buildings, partnerships, PropTech enabling timeshares property, real estate tokenization/blockchain, virtual reality property tours, and a platform for easily accessing technicians/artisans. It is noteworthy that a significant portion of respondents (10) expressed the view that there are currently no unadopted beneficial PropTech tools, suggesting that they perceive the existing range of PropTech tools available in the study area to be sufficient for meeting the real estate

needs. These insights shed light on potential areas for further development and adoption of PropTech solutions in the Lagos real estate market, indicating opportunities for enhancing efficiency, improving customer experiences, and driving innovation within the industry.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Preamble

The preceding chapter was dedicated to the analysis and presentation of data, as well as the interpretation of the findings. This final chapter serves to provide a summary of the key findings, followed by recommendations based on the study's outcomes, and concludes with an overall conclusion of the research study.

5.2 Summary of Findings

The adoption of PropTech in the Lagos real estate market has unlocked significant potential and revealed new possibilities for the industry to embrace the digital transformation. Recognizing the importance of understanding the adoption rate and potential of PropTech, this research study aims to provide valuable insights to stakeholders interested in leveraging PropTech tools in their real estate practices. By exploring the adoption and utilization of PropTech, this study contributes to the knowledge base and offers valuable information for achieving a sustainable and thriving real estate sector in Lagos.

Based on the foregoing, having presented and interpreted the analysis of data collected from the respondents in the previous chapter, the findings are however presented based on each objective as follows:

5.2.1 Adoption and Utilization of PropTech in the Lagos Real Estate Market

The study findings reveal that PropTech tools play a significant role in shaping the Lagos real estate market. Online listing and rental platforms emerged as the most widely adopted PropTech tools, followed by property management software, digital payment solutions, and virtual reality property tours. Data analytics for market insights and customer relationship

management systems were also recognized as essential tools contributing to the modernization and optimization of real estate practices.

The results underscore the growing importance of digital platforms and data-driven solutions in the industry. Real estate professionals recognize the benefits of adopting PropTech, including improved efficiency, enhanced customer experiences, and data-backed decision-making. The findings indicate a shift towards tech-enabled approaches for property transactions and market analysis, reflecting the industry's responsiveness to evolving consumer expectations and the need for streamlined operations.

These insights emphasize the transformative potential of PropTech in the Lagos real estate market, presenting opportunities for stakeholders to leverage innovative tools and solutions to drive growth, competitiveness, and improved outcomes. Embracing the digital transformation enabled by PropTech allows real estate professionals to unlock new avenues for success and better position themselves to thrive in a dynamic and technology-driven market. As the industry embraces PropTech, it opens up possibilities for enhanced customer engagement, data-driven strategies, and improved operational efficiencies, all of which are crucial for sustainable growth and success in the evolving real estate landscape.

5.2.2 Perception and Challenges of Utilizing PropTech in Lagos Real Estate

After carrying out the analysis in relation to evaluating the perceptions and challenges of utilizing PropTech in the Lagos real estate market, the findings revealed that respondents recognized the significant potential benefits that PropTech offers. They acknowledged its capacity to enhance efficiency, effectiveness, and overall customer experience, making it a valuable tool for streamlining real estate operations and addressing industry challenges.

Despite its potential, the analysis also shed light on several obstacles hindering the widespread adoption and utilization of PropTech in the Lagos real estate market. Respondents highlighted limited access to funding and investment opportunities as a major barrier, restricting the growth and scalability of PropTech ventures. Additionally, there was a notable concern regarding the limited awareness and understanding of PropTech solutions among potential clients, indicating the need for increased education and awareness campaigns to bridge this knowledge gap. Regulatory challenges, such as the absence of supportive policies and frameworks for PropTech startups, further hindered its implementation. The resistance to change within the real estate sector and the prevailing talent shortage in terms of skilled professionals with expertise in PropTech were also identified as significant challenges.

These results emphasize the importance of addressing these challenges to fully harness the potential of PropTech in the Lagos real estate market. By overcoming these obstacles and implementing effective strategies, stakeholders can unlock the transformative power of PropTech, paving the way for enhanced operational efficiency, improved customer experiences, and sustainable growth in the real estate industry. To capitalize on the opportunities presented by PropTech, it is essential for industry players to collaborate, invest in education and training, advocate for supportive policies, and foster a culture of innovation and adaptation. By doing so, the Lagos real estate market can effectively integrate PropTech and position itself for continued success and competitiveness in the ever-evolving digital landscape.

5.2.3. Future Prospects of PropTech in Lagos

Through an exploration of the future prospects of PropTech in Lagos, it uncovered a positive outlook among respondents. They expressed optimism about the potential of PropTech to drive innovation, streamline operations, and elevate the overall real estate landscape. Participants

identified specific areas that hold promise for the future of PropTech, including the integration of blockchain technology, virtual reality (VR), augmented reality (AR), and predictive analysis.

The results highlight a recognition of the transformative power of these emerging technologies in shaping the real estate industry's future. Respondents acknowledged the potential of blockchain to enhance transparency and security in property transactions, while VR and AR were seen as capable of providing immersive property viewing experiences. Additionally, the utilization of predictive analysis was perceived as a means to inform decision-making and improve efficiency in real estate operations.

These insights shed light on the perception of PropTech as a catalyst for positive change in the Lagos real estate market. The acknowledgment of these technologies and their future potential indicates a willingness to embrace innovation and adopt tech-driven solutions to address industry challenges. By harnessing the possibilities presented by blockchain, VR, AR, and predictive analysis, stakeholders can pave the way for a more efficient, customer-centric, and technologically advanced real estate sector in Lagos. Through strategic implementation and collaboration, the future of PropTech in Lagos holds the promise of unlocking new opportunities and driving the industry forward into a tech-enabled era.

5.3 Conclusion

In conclusion, this study underscores the significant and growing adoption of PropTech in the Lagos real estate market, as evidenced by the findings. The results shed light on both the perceived advantages and challenges that accompany the implementation of PropTech solutions. These valuable insights are of great importance to industry stakeholders and policymakers as they aim to facilitate the seamless integration of PropTech into the real estate sector.

The study's findings offer essential guidance for decision-makers, providing them with a deeper understanding of the benefits and obstacles related to PropTech implementation. This understanding can inform strategic initiatives aimed at maximizing the potential of PropTech in the Lagos real estate market. Furthermore, the identification of areas for future development and improvement emphasizes the need for continued innovation and collaboration within the PropTech ecosystem.

By leveraging the insights gained from this study, stakeholders can cultivate an environment conducive to the effective adoption and utilization of PropTech. This, in turn, can lead to enhanced operational efficiency, improved customer experiences, and increased competitiveness within the Lagos real estate market. Overall, the results contribute to the advancement of the real estate industry by promoting the adoption of innovative technologies and positioning Lagos as a hub for PropTech innovation. As the real estate market continues to evolve, the integration of PropTech is poised to drive transformative changes and revolutionize the industry's landscape.

5.4 Opportunities for Further Research

Despite the relevance of this research work, there are still several opportunities that can be explored by other researchers in order to widen the scope of this topic. These opportunities include:

a) In-depth exploration of specific PropTech tools: While this study provided a broad overview of the adoption and utilization of PropTech tools, further research can focus on specific tools in more detail. This could involve examining their effectiveness, user satisfaction, and the impact they have on different aspects of the real estate industry, such as property transactions, customer experience, or sustainability practices.

b) Comparative analysis across different real estate markets: Conducting comparative studies between the Lagos real estate market and other regional or global markets can provide valuable insights. Such research can shed light on the similarities and differences in PropTech adoption, utilization, and its impact on various markets. Comparative analysis can help identify best practices, challenges, and opportunities for cross-learning and knowledge exchange.

c) Long-term impact assessment of PropTech: As PropTech continues to evolve rapidly, there is a need for longitudinal studies to assess its long-term impact on the Lagos real estate market. This can involve tracking changes in market dynamics, analyzing the sustained adoption and utilization of PropTech tools, and evaluating their influence on key performance indicators, such as transaction volume, property values, or market transparency.

d) User experience and satisfaction: Exploring the user experience and satisfaction levels with PropTech tools can provide valuable insights into its effectiveness and acceptance. Qualitative studies or surveys can be conducted to gather feedback from real estate professionals, property owners, and tenants about their experiences with PropTech solutions. This research can help identify areas for improvement and inform the development of user-centric PropTech innovations.

e) Policy and regulatory frameworks: Further research can focus on examining the policy and regulatory frameworks surrounding PropTech in the Lagos real estate market. This can include evaluating existing regulations, identifying potential barriers or gaps, and proposing recommendations to foster a supportive environment for PropTech adoption. Additionally, studying the impact of policy changes or incentives on PropTech utilization can provide valuable insights into effective regulatory strategies.

These opportunities for further research aim to deepen the understanding of PropTech's potential in the Lagos real estate market and contribute to the continuous development and advancement of the field. By exploring these avenues, researchers can contribute to the body of knowledge surrounding PropTech and its implications for the real estate industry in Lagos and beyond.

5.5 Recommendation

Based on the findings and insights gathered from this study on PropTech in the Lagos real estate market, several recommendations are proposed:

Firstly, there is a need to increase awareness and education about PropTech among real estate professionals and industry stakeholders. This can be achieved through workshops, seminars, and training programs that highlight the benefits, functionalities, and potential applications of PropTech. By enhancing knowledge and understanding, stakeholders can make informed decisions and effectively leverage PropTech tools for improved business operations.

Secondly, fostering collaboration and partnerships between PropTech companies, real estate firms, and other relevant stakeholders is crucial. Establishing partnerships can facilitate knowledge sharing, co-creation of innovative solutions, and access to resources such as funding and expertise. Industry associations and government agencies can play a crucial role in facilitating such collaborations and creating platforms for networking and exchange.

Addressing barriers to adoption is another important recommendation. This includes overcoming challenges such as limited access to funding and investment opportunities, resistance to change, regulatory hurdles, and talent shortage. Efforts should be made to provide financial support, create supportive policies and regulations, promote a culture of innovation, and foster the development of a skilled workforce in the field of PropTech.

Continuous monitoring and evaluation of PropTech's impact and effectiveness in the Lagos real estate market is essential. Ongoing research and assessment can provide valuable insights into the evolving trends, emerging technologies, and best practices in PropTech adoption and utilization. This information can guide industry stakeholders and policymakers in making informed decisions and staying abreast of the latest developments.

Finally, encouraging data sharing and standardization within the real estate industry is crucial for maximizing the potential of PropTech. This can facilitate interoperability between different PropTech tools, improve data quality and accuracy, and enable seamless integration and exchange of information. Industry-wide initiatives, supported by government agencies, can encourage data sharing protocols and the establishment of common standards for data formats and APIs.

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FACULTY OF ENVIRONMENTAL DESIGN AND MANGEMENT

DEPARTMENT OF ESTATE MANAGEMENT

Dear Respondent,

As a final-year student in the Department of Estate Management at Obafemi Awolowo University, one of my degree requirements is to conduct a research study on "THE POTENTIAL OF PROPTECH IN THE LAGOS REAL ESTATE MARKET". This questionnaire has been designed to elicit insightful responses regarding the current state of the Adoption of PropTech and the future potential of PropTech in the Lagos real estate market. Your candid feedback is crucial to the success of this study, and I would greatly appreciate your contribution. Thank you in advance for your time and input.

Yours sincerely,

Samuel Damola Jolayemi

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Researcher

Section A: Socio-economic features

Please tick the options as appropriate in the spaces under-listed.

1. Gender: Female [ ] Male [ ]

2. Location of PropTech Company in Lagos: _____

3. What is your current Job Title/Role: Software Engineer/Developer [ ] Product Manager [ ] UX/UI Designer [ ] Data Analyst/Scientist [ ] Marketing Manager [ ] Sales Executive/Manager [ ] Customer Success Manager [ ] Business Development Manager [ ] Operations Manager [ ] Financial Analyst/Manager [ ] Others (Please Specify) _____

4. Years of working experience in the PropTech Industry: 1-5 [ ] 5-10 [ ] 10-15 [ ] Above 15 [ ]

5. What PropTech Revolution is your company currently exploring (Select all that apply): PROPTECH 1.0 (Digitized Real Estate Listings and Transactions.) [ ] PROPTECH 2.0 (Efficient operations and Smart Building management.) [ ] PROPTECH 3.0 (Smart, Sustainable, and Personalized Real estate) [ ] PROPTECH 4.0 (Integrating Emerging Technologies for Better Real Estate Experiences) [ ]

Section B: Adoption of PropTech in the Lagos Real Estate Market

Please tick the options as appropriate in the spaces under-listed.

6. In what year did you first become aware of PropTech? _____

7. How did you hear about PropTech and its applications in the real estate industry? Through industry events or conferences [ ] Through professional networks or associations [ ] Through online sources (websites, blogs, social media) [ ] Through word-of-mouth recommendations [ ] Through educational institutions or training programs [ ]

8. Have you used any PropTech tools or platforms in your real estate transactions? Yes [ ] No [ ]

9. If Yes, please specify the types of PropTech tools or platforms you have used (Select all that apply): Online Listing and Rental Platforms [ ] Virtual reality property tours [ ] Blockchain-based property transactions [ ] Data analytics for market insights [ ] Property Management Software (PMS) [ ] Customer Relationship Management (CRM) [ ] Digital Payment Solutions [ ] Others (Please Specify) _____

10. How frequently do you utilize PropTech tools in your real estate activities? Very Frequently [ ] Occasionally [ ] Rarely [ ]

11. Which specific functionalities or features of PropTech tools do you find most beneficial, (Select all that apply)? Online Listing and Rental Platforms [ ] Virtual reality property tours [ ] Blockchain-based property transactions [ ] Data analytics for market

insights [ ] Property Management Software (PMS) [ ] Customer Relationship Management (CRM) [ ] Digital Payment Solutions [ ] Others (Please Specify) _____

Section C: Perceptions, and Challenges of utilizing PropTech in Lagos Real Estate Market

Please tick the options as appropriate in the spaces under-listed.

12. In your estimation, what percentage of real estate professionals in Lagos actively adopt PropTech solutions? Less than 25% [ ] 25% to 50% [ ] 51% to 75% [ ] More than 75% [ ]

13. To what extent do you believe PropTech solutions have influenced the efficiency and productivity of your company? Significantly improved efficiency and productivity [ ] Somewhat improved efficiency and productivity [ ] No significant impact on efficiency and productivity [ ] Unsure/Not applicable [ ]

14. What factors do you believe have contributed to the growth/adoption of PropTech solutions in Lagos? (Select all that apply): Technological advancements [ ] Changing consumer preferences [ ] Government support and regulations [ ] Real estate industry demands [ ] Cost-effectiveness and efficiency benefits [ ] Improved access to property data and analytics [ ] Collaboration and partnerships within the industry [ ] Others (Please Specify) _____

15. Which of the following challenges have you faced in implementing PropTech solutions in your operations? Technical challenges [ ] Resistance to change by staff [ ] Cost of implementation [ ] Integration with existing systems [ ] Training staff on how to use the new technology [ ] Others (Please Specify) _____

16. What are the disadvantages of working in the PropTech industry in Nigeria? (Select all that apply): Limited awareness and understanding of PropTech solutions among potential clients [ ] Resistance to change and reluctance to adopt new technologies in

the real estate sector [ ] Regulatory challenges and lack of supportive policies for PropTech startups [ ] Limited access to funding and investment opportunities for PropTech ventures [ ] Talent shortage and lack of skilled professionals with expertise in PropTech [ ] Others (Please Specify) _____

Section D: The Future Prospects of PropTech in the Lagos Real Estate Market

Please tick the options as appropriate in the spaces under-listed.

17. On a scale of 1 to 10, how would you rate the usefulness of PropTech Solutions in Real Estate Practice?

18. As an employee working in a PropTech start-up in Lagos, how do you foresee the growth of new start-ups in the PROPTECH industry over the next 5 years? Minimal Growth [ ] Moderate Growth [ ] Significant Growth [ ] Rapid Growth [ ] Exponential Growth [ ]

19. In your opinion, what other PropTech solutions do you think could be beneficial to the Lagos real estate market but have not been adopted yet?