



AWARENESS AND ADOPTION OF PROPERTY TECHNOLOGY (PROP TECH) IN REAL ESTATE PRACTICE IN LAGOS STATE

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ABSTRACT

The practice of the real estate sector is evolving remarkably throughout the world, especially in developed economies from traditional ways to the technology driven one to enhance service delivery in the sector. However, in developing economies like Nigeria, there is the need to integrate such technology driven tools to her real estate practice. This study focused on the level of awareness and adoption of property technology in real estate practice in Lagos state, Nigeria. It identified the profiles of real estate firms in Lagos State, Nigeria; examined the level of awareness and adoption of property technology (Prop Tech) in Lagos State, Nigeria. Primary data was obtained from two hundred and five (205) real estate firms in the study area through the administration of questionnaires by stratified sampling. The questionnaires sought information on the level of awareness and adoption of Prop Tech in real estate practice in Lagos State. Data collected were analyzed with the use of descriptive such as mean and relative adoption indices (RAI). The level of awareness of Prop Tech was high with sum weighted average mean of 3.65 while the level of adoption of Prop Tech was moderate with sum weighted average mean of 3.02. The study recommended that the efforts should be intensified on real estate professionals to adopts other technological tools such as internet of things, blockchain, artificial intelligence and cloud technology which were relative low and PropTech provider should also encourage them on the use of technological tools and the benefits inherent in their usage in real estate practice in order to enhance service delivery in the study area.

1. INTRODUCTION

Real estate practice has undergone a remarkable evolution throughout the world most especially in the developed countries such as USA, China, Canada, Germany, amongst others. The practice has changed from the traditional ways, tagged to be more rigorous, tedious and time consuming, to the technology driven practice that saves time and cost of transaction within the shortest period

in the real estate industry (Olajide, Osalusi & Oduroye, 2024). Real estate practice is a multi-staged discipline that requires vast knowledge and skills in collecting, using and analyzing information that could be immensely benefited from the use of technologies in real estate markets in order to achieve predetermined goals (Kitulazzi & Mirembe, 2024).

In developing nations like Nigeria, the need to incorporate technologies in real estate practice like their counterparts in the developed countries, cannot be overemphasized. Technology is generally considered as a major means of effecting positive change in the real estate industry and by extension economy of any nation. The transition to data driven technologies is opined to have contributed to the advancement of the real estate industry (Tunji-Olayemi, 2018; Momade, Durdyey, Tam & Shaid, 2021; Okpo, Ikediashi & Dama, 2023). The technological innovations have made it indispensable for professionals in real estate industry as a result of its proficiency and efficiency in terms of time saving, cost of transaction and transparency in the real estate sector. It also appears to be less rigorous in proffering solutions to many real estate problems and challenges facing professionals in the industry. However, the awareness and implementation of these technologies by property managers in the developing nations could be minimal, as it appears that the contemporary methods are still in vogue

Technology seems to have become an eye opener in transforming the real estate sector through the use of property technology such as Geographical Information System (GIS), Drones, Blockchain, Internet of Things (IoTs), Virtual and Augmented Things, Building Information Modelling (BIM), and Artificial Intelligence (AI). These property technologies are reshaping how real estate services are delivered through property development, property listing, valuation, marketing, and management, among others (Al-haimi, Khalid, Zakaria & Jazimin, 2025). For instance, artificial intelligence (AI) and machine learning (ML) technologies, offer sophisticated algorithms that predict property values with greater precision, while analytics provide comprehensive market insights (Olukayode, 2024; Abdulazeez, Ihechere & Idemudia, 2024). Geographical Information Systems (GIS) appear to ensure and facilitate analysis of properties in different locations, while blockchain technology seems to enhance transaction transparency.

In Lagos State, which is acclaimed to be the commercial and economic hub of Nigeria, real estate practice is known to be vibrant and rapidly evolving due to the sporadic urbanization of the centre. Furthermore, the presence of technological startup companies and investors and large size of the real estate market in the centre. Despite the potential benefits of PropTech in the real estate sector, its level of awareness and adoption among real estate surveying and valuation firms are remain unknown. It is against this background that this study examined the awareness and adoption of property technology in real estate practice in Lagos State.

2. LITERATURE REVIEW

2.1 Concept of PropTech

PropTech means any application in the real estate sector, be it 3D visualizing, home matching tools, crowdfunding, fintechs, drones, AI data analytics, BIM, blockchains, internet of things(IoT), ConTech, smart buildings etc. PropTech involves the use of technological innovations

that disrupt and enhance the value chain of the real estate sector, including construction, property management, sales and investment (Ullah, Sepasgozar & Wang, 2021).

PropTech collectively defines start-up companies which use technological innovations to provide solutions to real estate problems (Pyle, Grunewald & Wright, 2017). PropTech emerged as a culmination of years of development, finance and innovation, centered on real estate transparency, participation and understanding. This multidisciplinary development has evolved into a lucrative industry (Baum 2017; Forbes; 2018). According to Baum (2017), the first wave of PropTech took place around the mid-80s in the United States of America and the United Kingdom.

PropTech innovations became part of the digital transformation of the real estate industry, in terms of leading the market and promoting a radically new approach to the acquisition, operation and management of the real estate (Siniak, Kauko, Shavrov & Marina, 2020). PropTech is furthermore a collective term used for the determination of start-ups that offer technologically innovative products and new business models for the real estate markets.

2.2 Evolution of PropTech

PropTech is generally refers to as start-up companies which use technological innovations to provide solution to real estate problems (pile et al., 2017). PropTech emerges as a culmination of years of development, innovation and finance to effect real estate transparency, seamless participation, understanding of of real estate market among stakeholders in the sector. According to Baum (2017, the first wave of PropTech took place in mid-80s in United State of America and the United Kingdom which is known as PropTech 1.0. due to the introduction of personal computer and disc to support excel data analysis application which really changed the direction of real estate industry. Digital technology began to be adopted by real estate sector when personal computing became more necessary such as spreadsheet and accounting software by real estate companies.

The increase in demand for need to make real estate sector more sophisticated and efficient also led to the evolution of PropTech 2.0 at the start of the 21st century (ING, 2018). This bridged the gap between PropTech 1.0 and the members of the public. The use of technology and increase in awareness about its accessibility and affordability of technological gadget such as mobile phones, cloud computing, WiFi and 4G brought new direction in the real estate sector (Baum, 2017). The concept of PropTech 3.0 was developed in 2017 at the Oxford University School of Business, the United Kingdom. Therefore, PropTech became part of the digital transformation of the real estate industry and significantly changed the direction of real estate transactions in the sector (Siniak et al., 2020). PropTech ensure fully implementation of emerging technologies such as drones, artificial intelligence, internet of things, blockchain, virtual reality, smart contracts in the real estate sector. PropTech 3.0 are the emerging technologies such as drones, virtual reality tools, IoTs and blockchain which are using in the real estate sector (Siniak et al., 2020).

2.3 Empirical Evidence on Awareness and Adoption of PropTech in Real Estate Practice

The study of technological tool in real estate practice has been subject of issue to academic researchers throughout the world, especially in developed countries. Available studies have shown that efforts have been made on the issues of technological tools which includes factors influencing the deployment of innovative (ICT) facilities by construction organizations in Port Harcourt, Nigeria (Onyejeakor, Eze, Onyeagam & Adegboyega, 2020); factors influencing the use of information and communication technology in real estate practice in Minna (Adeyemo, kemiki, Adama & Ayoola, 2025). None of these studies delve into the level of awareness and adoption of PropTech in real estate practice in Lagos State.

It is necessary to look into findings of the various studies that relate to this study. For instance, Olaleye, Ayodele, Adegoke & Agbato (2025) studied the awareness-based indicators of the potential of blockchain technology by real estate practitioners in Lagos State, Nigeria. They indicated that the blockchain awareness in Lagos among real estate professionals was very high but its applicability was only limited to real estate agency and property management compared to other areas of real estate practices. Similarly, Adewusi & Gbadebo (2023) studied on awareness artificial intelligence technologies for residential valuation in Lagos metropolis. They affirmed that there was a general lack of awareness of artificial intelligence among estate valuers practicing in Lagos metropolis. However, these studies only focused on blockchain and artificial intelligence among other PropTech tools use in real estate practices. Furthermore, the studied of the relevance of augmented reality/virtual reality in real estate (Singh & Muthal, 2024); benefits and challenges to the adoption of modern technologies for real estate marketing in Lagos State, Nigeria. There is little efforts on the awareness and adoption of PropTech in real estate practice since previous studies either focus on benefits and challenges or relevance of technological tools, therefore created gap to be filled by this study.

3. MATERIAL AND METHODS

The study area of this study was Lagos State, and it was chosen because it is the centre of commercial and economic activities in Nigeria. This therefore make the real estate development with technological tools to be relatively higher than any other part of the country. The target population consist of real estate surveying and valuation firms in Lagos State, Nigeria. The questionnaires were distributed to Estate Surveyors and Valuers in Lagos State through the aid of google form for data collection. A total of two hundred and fifty questionnaires were retrieved from the respondents representing 82.3% of response rate and they were also contacted through their professional's platforms. Data collected were analyzed using mean score and relative adoption indices (RAI). The study adopted a five-point likert scale to measure the level of awareness and adoption of Prop Tech in real estate practice in the study area. The key to the scale index used in the five-point likert scale was as follows: 4.5-5= extremely aware/adoption, 3.50-4.49= highly aware/adoption, 2.50-3.49= moderately aware/adoption, 1.50-2.49= slightly aware/adoption, 0.1-1.49= not at all. Descriptive analysis technique was adopted to analyze the data collected with used of mean ratings.

4. RESULTS AND DISCUSSION

This section is structured into two parts. The first part examined the profiles of the real estate surveying and valuation firms. The second part contained the level of awareness and adoption of Prop Tech by real estate surveying and valuation firms in Lagos State, Nigeria.

Table 1: Profile of Real Estate Surveying and Valuation Firms

Parameters	Response	Percentage of Response (%)
Educational Qualification	ND	23
	HND/BSc	132
	MSc	41
	Ph.D	9
	Total	205
Professional Cadre	Probationer/Graduate	42
	Member	104
	Fellow	59
	Total	205
Year of Operation in Lagos	1-5	8
	6-10	26
	11-15	35
	16-20	73
	21+	63
	Total	205
Years of Involving in Prop Tech	1-5	55
	6-10	112
	11-15	25
	16+	13
	Total	205

Source: Field Survey, 2026

Table 1 shows the educational qualification shows that 64.4% of respondents have HND/BSc qualification, followed by 20% with MSc/MTech while 11.21% have ND while the remaining 4.39% represent the real estate professionals with PhD qualification. It is discovered that the larger percentage of respondents were HND/BSc holders. This implied that real estate practitioners with first degree are more than other holders' degree in the study area. The Table 4.2 further shows the professional cadre with 20.49% of the respondents are probationer/graduate in the firms while the Member and Fellow of the profession in the firms are 50.73% and 28.78% respectively.

Years of Operating in Lagos State shows that 35.62% of respondents' years of operating were between 16-20, followed by 30.73% of respondents with operating years at 20+, while the 17.07% of respondents have years of operating in between 11-15, followed by 12.68% of respondents have years operating in between 6-10 while the remaining 3.90% of respondents years of operating in

between 1-5. It is discovered that 16-20 of respondents' years of operation were the majority of real estate firms in Lagos State.

Years of involving in PropTech shows that 54.63% of respondents' year of involving in PropTech tools are in between 6-10, followed by 26.83% are in between 1-5 while the 12.20% were in between 11-15 while the remaining 6.34% were in 16+. It is observed that 54.63% of respondents' year of involving in PropTech tools are the majority of real estate firms in Lagos State.

It is observed that majority of real estate firms in Lagos State adopt PropTech. This could be as a result that Lagos State serves as a commercial and economy hub of Nigeria where real estate are developed with the integration of PropTech tools in order to enhance their performance and services. Also, the era evolving technological innovations could make any redundant estate firm to be disadvantaged in the high competitive professional environment. Hence, there is the need to constantly be abreast with global best practices.

Table 2: Level of Awareness of PropTech Tools in the Study Area

S/N	PropTech Tool (N = 205)	SWV	Mean	RAI	Rank
1	Mobile application	943	4.61	0.92	1 st
2	3D visualization	790	3.85	0.77	2 nd
3	Virtual reality	768	3.74	0.75	3 rd
4	Geographical Information System (GIS)	760	3.70	0.74	4 th
5	Drone	754	3.68	0.73	5 th
6	Building information modelling	740	3.61	0.72	6 th
7	Decision support system	726	3.54	0.70	7 th
8	Artificial intelligence	710	3.46	0.69	8 th
9	Smart building	704	3.43	0.68	9 th
10	Data analytics	698	3.41	0.68	10 th
11	Blockchain	685	3.34	0.66	11 th
12	Cyber security	614	2.99	0.59	12 th
13	Internet of Things (IoTs)	592	2.88	0.57	13 th
14	Cloud technology	585	2.85	0.57	14 th
15	Robotic automation	564	2.75	0.55	15 th
	Aggregate mean		3.65		

Note: Sum Weighted Value = SWV

Source: Field Survey, 2026

Table 2 showed the mean scores values base on the awareness level of PropTech tools. The order of level of awareness of PropTech solutions with highly awareness are as follows: mobile application (mean = 4.61), 3D visualization (mean = 3.85), virtual reality (mean = 3.74), geographical information system (mean = 3.70), Drone (3.68), building information modelling (mean = 3.61), decision support system (mean = 3.54). Also, other PropTech solution with moderate awareness are artificial intelligence (mean = 3.46), smart building (mean = 3.43), data

analytics (3.41), blockchain (mean = 3.34), cyber security (mean = 2.99), internet of things (mean = 2.88), cloud technology (mean = 2.85) and robotic automation (mean = 2.75).

It is observed that mobile application was the most known PropTech tool among real estate professionals. This could be as a result that mobile applications have been in use for years before the advent of the development of other PropTech tools in real estate practice. Mobile applications also save cost and time and therefore enhances service delivery in the sector. It also observed that cyber security, internet of things, cloud technology and robotic automation are rarely known among the professionals in the study area.

Generally, the level of awareness of property technology tools have mean score of values greater or equal to 2.50; this was an indication of respondents' agreement on the awareness level of property technology tools. To a large extent, the findings of this study support the studies of Akeju et. al. (2021) and also contrary to the studies of Adewusi & Gbadejo (2023) studies which revealed that there was lack of awareness of artificial intelligence among real estate professionals in Lagos State.

Table 3: Level of Adoption of PropTech Tools in the Study Area

S/N	PropTech Tools (N = 205)	SWV	Mea n	RAI	Rank
1	Mobile application	769	3.75	0.75	1 st
2	Geographical Information System (GIS)	724	3.53	0.71	2 nd
3	Virtual reality	719	3.51	0.70	3 rd
4	3D visualization	714	3.48	0.69	4 th
5	Decision support system	708	3.45	0.69	5 th
6	Building Information Modelling (BIM)	705	3.44	0.68	6 th
7	Smart building	698	3.40	0.68	7 th
8	Drone	694	3.39	0.67	8 th
9	Data analytics	628	3.06	0.61	9 th
10	Cyber security	546	2.66	0.53	10 th
11	Internet of Things (IoTs)	522	2.54	0.50	11 th
12	Blockchain	508	2.48	0.49	12 th
13	Artificial intelligence	502	2.45	0.49	13 th
14	Cloud technology	472	2.30	0.46	14 th
15	Robotic automation	389	1.89	0.37	15 th
	Aggregate mean		3.02		

Note: SMV = Sum Weighted Value

Source: Field Survey, 2026

Table 3 shows the mean values based on the level of adoption of PropTech tools. The order of adopted PropTech tools in real estate with highly adoption/utilization were mobile application (mean = 3.75), geographical information system (mean = 3.53), virtual reality (mean = 3.51). Also, PropTech tools moderately adopted were 3D visualization (mean = 3.48), decision support system (mean = 3.45), building information modelling (mean = 3.44), smart building (mean = 3.40), drone (mean = 3.39), data analytics (mean = 3.06), cyber security (mean = 2.66) and internet of things

(mean = 2.54). The other PropTech solutions with low adoption are blockchain (mean = 2.48), artificial intelligence (mean = 2.45), cloud technology (mean = 2.30) and robotic automation (mean = 1.89). This indicates that the most adopted PropTech tools in the study area were mobile application, geographical information system, virtual reality, 3D visualization, decision support system and building information modeling (BIM).

It is observed that mobile application was the most adopted PropTech solution (tool) among real estate professionals. This could be due to the understanding that mobile applications featuring mails, online rent payment, communications, etc, which are very easy to use and operate compared to other PropTech tools, therefore, it enhance and engendering real estate practice.

Generally, the level of adoption of property technology tools have mean score of values greater or equal to 2.50; this was an indication of respondents' agreement on the adoption level of property technology tools. To a large extent, the findings of this study support the studies of Adejumo et al. (2024) and Ajani et al. (2025).

5. CONCLUSION

This study examined the awareness and adoption of Prop Tech in real estate practice in Lagos State intending to provide information on the level of awareness and adoption of Prop Tech among real estate surveying and valuation firms in the study area. The study established that the level of awareness of Prop Tech are very high with aggregate of mean of 3.65 but the level of adoption are still moderate with aggregate mean of 3.02 among real estate professionals in the study area. The findings further showed that mobile application, geography information system, virtual reality and 3D visualization are the most adopted PropTech tools among the real estate professionals in the study area. This study corroborated the studies of Adejumo et al. (2024); Ajani et al. (2025) and Aihie (2019).

6. RECOMMENDATIONS

This study recommended that there should be adequate awareness among real estate professionals on the growing importance of PropTech and also educate them on the benefits inherent in the adoption of PropTech in the sector. The professional bodies should also organize timely workshops for real estate firms on how to integrate PropTech to their daily real estate practices. Technological service providers can also encourage real estate professionals to adopt those tool with low usage such as artificial intelligence, cloud technology and robotic automation about the immense potential of reshaping the real estate sector.

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