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| RESEARCH ARTICLE

The Impact of Prop Tech and Innovation on Real Estate Education and Research in Nigeria

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| ABSTRACT
Prop Tech is a technology that appears to have been widely adopted in the real estate sector in Nigeria and is gaining more ground. Their impact on real estate education and research in Nigeria is one that has been brought to lime light and has called for study. There is need to highlight the challenges and opportunities presented by technology in the industry. Hence, the this paper aims to explore the impact of Prop Tech and innovation on real estate education and research in Nigeria, highlighting the challenges and opportunities presented by technology in the industry. The research is more of a survey which is specifically to gather relevant data. Data Collection included the distribution of surveys to Estate Surveyors and Valuers (ESVs) who are also industry professionals. The analysis was done using simple percentages, means rank and ANOVA with the use of SPSS, statistical software. The data analysis includes a quantitative analysis of survey responses to identify trends and patterns. The findings from the collected from 400 Estate Surveyors and Valuers (ESVs) in Nigeria shows some keys gaps in the integrations of relevant technologies in education and research, factors influencing the adoption or resistance to Prop Tech, Strategies for integrating Technology into real estate as well as Potential partnerships and collaboration. This research indicates the dire need for real estate education programs in Nigeria to incorporate prop tech and innovation into their curriculum. This can be done by creating awareness to all practitioners in the industry including the teaching students how to use technology to enhance their understanding of the real estate market.

| KEYWORDS

Education, Innovation, Prop Tech, Real Estate, and Research.

| ARTICLE INFORMATION

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1. Introduction

The real estate industry in Nigeria is undergoing a transformation fuelled by technological advancements and innovation. Hence, the advent of digitalisation has been said to have revolutionized various industries and processes, (Edovia, 2023). Real estate operations, processes and business models are witnessing great changes due to the introduction of digitalization into real estate (Vigren *et al.,* 2022). PropTech, a short form of property technology, is a term which refers to the use of advancement in technology in managing, buying, selling, and in renting of real estate, (Siniak *et al.,* 2020). It features technological solutions which includes online listings of property, virtual tours, property management software, smart home devices, and blockchain technology used for transactions, (Sáiz, 2020). PropTech seeks to improve efficiency, transparency, and information availability for buyers, sellers, and investors in order to streamline and improve many areas of the real estate market, (Oluwole, 2017). Prop Tech, or the application of technology to real estate transactions, has the power to completely change how real estate is taught and studied in Nigeria and around the world (Siniak *et al.,* 2020).

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Prop tech represents an industry in which the traditional ways of buying, selling, and managing properties have been disrupted through technological innovations. Over time, the economy and investment in Nigeria have grown and become dynamically and globally integrated. In the past few years, Nigeria's real estate market, the land acquisition processes, building development workflows, and the ultimate use of real estate have all been affected by technology, Edovia, (2023) stated that the real estate market in Lagos, Nigeria, which has historically relied on manual procedures, has seen substantial changes because of the current boom in digitalization.

For real estate professionals to function profoundly in the industry, there is a need for extensive education and cutting-edge research hence a research paper by Oloyede, *etal,* (2017) reported on the need for new paradigms into real estate education in Nigeria. No doubt, over the years, university-level real estate education programs have been a topic of discussion in a global context, (Kin and Pior 2018). It is noteworthy to observe, that there appears to be obvious impact of technology revolution and access to more knowledge and data has transformed the manner in which property professionals work, but the skills whereas, the composition of the workforce have not kept up. Also, in the Nigerian context, there has been slow growth in the advancement of technological trends and knowledge impacting the real estate market, (Ozigbo *et al*., 2023). More so, the real estate industry practices, particularly in technology and financing, have seen limited growth and development in most emerging markets, including Nigeria, (Ozigbo *et al*., 2023). This, therefore, brings about the debate on whether Prop tech and innovation have significantly affected real estate education and research in Nigeria.

To this end, this paper aims to explore the impact of Prop Tech and innovation on real estate education and research in Nigeria, highlighting the challenges and opportunities presented by technology in the industry. To achieve the aim, the following objectives were set to; analyze the current trends and adoption rates of prop Tech and innovation in the real estate sector in Nigeria, and identify the challenges hindering widespread implementation; investigate how technology is revolutionizing real estate research and education in Nigeria, and identify the opportunities for increased efficiency, transparency, and data-driven decision-making; assess the skills gap and training needs in the real estate industry in Nigeria to fully leverage prop tech and innovation, and propose strategies for integrating technology into real estate education curriculum and explore potential partnerships and collaborations between technology providers, real estate practitioners, and educational institutions in Nigeria to enhance knowledge sharing, drive innovation, and address challenges in the industry.

2. Review of literature

Prop Tech adoption in the real estate sector in Nigeria has been gaining momentum, with a growing recognition of the need to embrace technological innovations to stay competitive. In a study by Aihie (2020), the emphasis was on the imperative for Nigerian estate surveying and valuation professionals to catch up with the Prop Tech revolution; this is to avoid being left behind. This highlights the increasing awareness within the industry of the importance of integrating technology into real estate practices. However, despite the potential benefits of Prop Tech, there appears to be challenges bedevilling its widespread implementation in Nigeria. These challenges include issues related to policy frameworks, skills gaps, and regulatory compliance. For instance, the study by Ibrahim (2014) points out the difficulties faced by financial institutions in Nigeria during the convergence to IFRS, indicating the complexities involved in adopting new standards and technologies. Moreover, the study by Winifred and Okojie (2015) highlights the challenges in implementing national policies, which could also impact the adoption of Prop Tech initiatives in the real estate sector. Additionally, the research by Agava *et al.* (2021) on real estate investment performance in Nigeria underscores the need for a deeper understanding of the challenges faced in the sector to drive effective implementation of innovative technologies like Prop Tech. While the adoption of Prop Tech in the real estate sector in Nigeria is on the rise, challenges such as policy implementation, skills development, and regulatory hurdles need to be addressed to facilitate widespread integration of technological innovations. By overcoming these obstacles, the real estate industry in Nigeria can fully leverage the benefits of PropTech to enhance market efficiency, transparency, and competitiveness.

The rapid advancement of technology has brought about significant changes in various industries globally, and the real estate sector is no exception, Kummerow and Lun, (2005) In Nigeria, technology is increasingly being integrated

into real estate research and education to streamline processes, improve market transparency, and support data-driven decision-making. This study on the Nigerian property market highlights the importance of identifying research priorities to guide education and research institutions in Nigeria and similar markets (Siniak *et al.,* 2020). Technological innovations such as online property listing platforms, virtual reality (VR) property tours, artificial intelligence (AI)-driven market analysis tools, and blockchain-based property transactions appears to have revolutionized real estate research practices in Nigeria, Adewunmi and Olaleye, (2011). These tools enable stakeholders to access real-time market data, conduct virtual property viewings, and perform in-depth analysis to support informed decision-making in real estate transactions. By leveraging these technologies, real estate professionals can enhance their research capabilities, minimize risks, and optimize investment strategies, Kummerow and Lun, (2005).

These technological advancements have paved the way for greater efficiency and convenience in the real estate industry, Siniak *et al.,* (2020). These advancements have also contributed to increased market transparency, allowing potential buyers and investors to make more informed decisions. In addition, the use of technology in the real estate industry has paved way for new opportunities for investors and developers to tap into emerging markets and regions.

Technology is also reshaping the landscape of real estate education in Nigeria, with online learning platforms, webinars, and virtual training sessions providing convenient and accessible ways for professionals to acquire knowledge and skills, (Ullah *et al.,* 2018; Siniak *et al.,* 2020; Hou and Wu, 2020). The integration of technology in real estate research and education presents significant opportunities for increasing efficiency, transparency, and data-driven decision-making in Nigeria, Bamidele and Emeghe**,** (2018). By embracing digital solutions, real estate professionals can streamline processes, reduce operational costs, and improve productivity, Ibem *et al.,* (2018). Enhanced market transparency through online platforms and data analytics tools enables stakeholders to make informed decisions based on accurate and up-to-date information. More so data-driven insights derived from technology-enabled research and education empowers decision-makers to optimize strategies, mitigate risks, and adapt to evolving market conditions effectively, Adewunmi and Olaleye (2011).

The ongoing technological revolution in real estate research and education in Nigeria holds immense potential for transforming the industry and driving sustainable growth. By embracing innovative technologies and leveraging digital tools for research, education, and decision-making, stakeholders can enhance efficiency, promote transparency, and foster data-driven practices that will shape the future of the Nigerian real estate market, (Ebekozien and Aigbavboa, 2021; Siniak *et al.,* 2020). Embracing this digital transformation will not only facilitate better collaboration and communication within the sector but also position Nigeria as a frontrunner in leveraging technology to drive progress and innovation in research and education, Aguboshim *et al.,* (2021).

The real estate industry in Nigeria no doubt is experiencing significant changes with the advent of technological advancements and innovation, Tara and Kumar (2016). To fully leverage prop tech and innovation, there is a need to address the skills gap and training needs in the industry Tara and Kumar (2016). These changes have created a demand for professionals who possess both traditional real estate knowledge and expertise in technology and data analysis. According to the sources mentioned, there are several strategies that can be implemented to integrate technology into real estate education curriculum and bridge the skills gap: Collaboration between vocational institutions and industries: By forming partnerships between real estate education providers and industry professionals, curriculum design can be informed by market needs and industry trends. Teaching a broad range of skills: Apart from technical skills related to prop tech, it is important to teach students critical thinking, problem-solving, communication skills, and adaptability, Oladokun and Gbadegsin (2017). They noted a embracing "talent incubator" mindset: Employers in the real estate industry should focus on hiring individuals with skills rather than just experience and qualifications. This can be done by providing opportunities for employees to take on different roles and supporting their professional development through training and mentorship programs. These measures will ensure that graduates are well-prepared for the evolving real estate industry and have the necessary skills to leverage prop tech and other innovations. By forming partnerships between real estate education providers and

industry professionals, curriculum design can be informed by market needs and industry trends, Oladokun and Gbadegsin (2017). This collaboration will ensure that graduates are equipped with the necessary skills to fully leverage prop tech and other innovations in the real estate industry. In addition, it is essential to incorporate soft skills into the teaching and learning process. Soft skills, such as communication, teamwork, problem-solving, and adaptability, are just as important as technical skills in the real estate industry, (Tessema 2017). These skills can enhance interpersonal interactions with clients, colleagues, and stakeholders, leading to better business outcomes. To address the skills gap and training needs in the real estate industry in Nigeria and fully leverage prop tech and innovation, it is important to invest in training and development programs for real estate professionals, (Oladokun and Gbadegesin, 2017). This can include online courses and mentorship that cover topics such as technology, data analysis, etc. supporting the adoption of prop tech solutions and innovative practices within the industry can help improve efficiency (Kummerow and Lun, 2005). This can be done through partnership with technology companies.

Technology providers, real estate practitioners as well as educational institutions in Nigeria can collaborate with aim of enhancing knowledge sharing including the drive for innovation in the industry by implementing various strategies. Technology transfer offices (TTOs) can play a critical role aimed at managing intellectual property assets through the creation of awareness intellectual property as well as engaging industry for research uptake, (Adelowo *et al*. 2023). The knowledge of management, science, technology and innovation is imperative for improving efficiency and competitiveness in companies, (Kiryakov, *et al.,* 2023). The curriculum of real estate education should be enriched with more details on the capital market in order to reflect its increasing significance to the Valuer's practice, (Onwuanyi and Adekanmi 2022). Industrial technology innovation strategic alliances (ITISAs) in the other hand can promote knowledge sharing through structural equation modeling (SEM), this can be made possible by considering factors that is believed to influence each stage of knowledge sharing, (Wang *et al.,* 2023). In addition, research and innovation can also be deployed to help overcome challenges in housing, urban infrastructure development; collaboration between the government, industry and research institutions is crucial, (Obianyo *et al.,* 2021).

It is believed that partnerships and collaborations between technology providers, real estate practitioners as well as educational institutions in Nigeria have the potentials that will likely aid knowledge sharing, drive innovation and more importantly address challenges in the industry, while emphasising prop tech, real estate and innovation (Afolayan, 2017; Obinna and Udo 2022; Braesemann and Baum; 2020 and Ibem *et al*., 2017).

3. Research methodology

The data for the study were collected from Estate Surveyors and Valuers (ESVs) in Nigeria. In total, 400 Estate Surveyors were involved in the study. Data were collected from the various registered Estate Surveyors and Valuers. The research is more of a survey which is specifically to gather data on the use of Prop Tech in real estate education as well as explore insights on the real estate education. Data Collection included the distribution of surveys to ESVs who are also industry professionals. The analysis was done using simple percentages, means rank and ANOVA with the use of SPSS, statistical software. The data analysis includes a quantitative analysis of survey responses to identify trends and patterns.

4.1 Analysis and Interpretation

4.1.1 Background Information of Respondents

The information shows the background information of the students and this include: gender, highest education qualification, professional qualification, number of years of experience.

Table 1

Gender	Frequency	Percentage
Male	343	85.7
Female	57	14.3
Highest Educational qualification	**Frequency**	**Percentage**
HND/BSc/BTech	228	57.0
MSc/MTech	144	36.0
PhD	28	7.0
Professional qualification	**Frequency**	**Percentage**
Fellow	58	14.5
Associate	228	57.0
Probationers/Graduate	114	28.5
Number of Years of Experience	**Frequency**	**Percentage**
1-5 years	228	57.0
6-10 years	114	28.5
11-above	58	14.5
TOTAL	**400**	**100.0**

Source: Field survey, 2024

The information revealed the availability and response of male respondents than female respondents. For Educational qualification, there were more HND/BSC/BTECH holders followed by MSC/MTECH Holders and PhD Holders respectively. A higher percentage of the respondents were Associates at 57.0%, followed by graduate and fellow. Also, majority of the respondents had minimal level of experience.

Table 2: Current trends of Proptech and innovation between 2014-2024

Year	Proptech Innovation platforms	SA	%	SD	%
2014	Online property platform	280	70	120	30
2015	Real time property existing platforms	300	75	100	25
2016	Virtual tours and 3D Visualization	210	52.5	190	47.5
2017	Block chain	350	87.5	50	12.5
2018	Crowdfunding platforms	295	73.8	105	26.3
2019	Smart home Technology Integration	292	73	108	27
2020	Smart home Technology Integration	288	72	112	28
2021	Automated property management systems	275	68.8	125	32.25
2022	Automated property management systems	268	67	132	33
2023	AI powered valuation tools	315	78.8	85	21.3
2024	AI powered valuation tools	300	75	100	25

Source: Field survey, 2024

The information above shows proptech innovation tools that emerged from year 2014 to 2024 as well as level of agreement by respondents. Year 2014, online property platform was strongly agreed to as the platforms available, its growth and impact on the commercial real estate market began to be strongly felt around this year Manyika *et al.,* (2013). This platform revolutionized the rental industry by offering flexible workspaces for freelancers, start-ups and small businesses as well as large companies. In year 2015, real time property existing platforms was rated as

strongly available, this platform continues to disrupt the traditional setting and rental industry by enabling property owners to rent out spaces on short term basis TradeArabia, (2022). This played a role in shaping the proptech landscape. In year 2016, virtual tours and 3D visualization emerged; this provides potential buyers with realistic and immersive experiences of properties without physically visiting them, Huang, (2016). In year 2017, block chain emerged, aside the fact that it offers increased security and transparency in real estate transactions, it also provides solutions for property management tasks such as leasing, rent collection etc., Sazu and Jahan, (2022). In year 2018, crowdfunding platform emerged; this allowed individuals to invest in real estate projects with lower capital regular growth providing more accessible options for investors to participate in property investment, Duese, (2018). In year 2019-2020, smart home technology integration happens to be available platforms as rated by the respondents as it enhances security, energy efficiency and home automation, Khedekar *et al.,* (2016). In year 2021 to 2022, automated property management systems was rated as strongly available, PenielTech, (2023). This streamlines and optimizes the management of residential and commercial properties. In year 2023 to 2024 saw the invention of AI powered valuation tools, use of machine learning, natural language processing and computer vision to improve real estate industry, Rice, (2019).

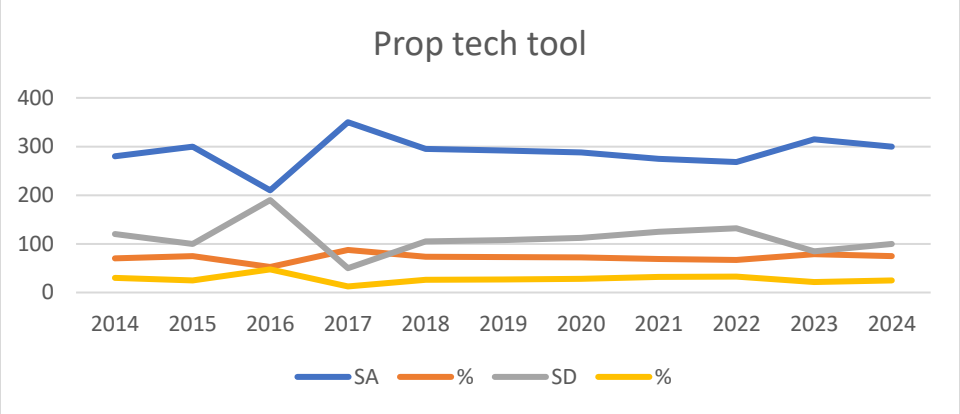

Figure 2

The figure expands the information as regards the current trend of proptech tool from year 2014 to 2024 using the information in table 2. This indicates the emersion and progression of these platform apps from the traditional pattern to online auctions, crowdfunding, AI etc.

Test on Current trend of proptech innovation using linear regression

Table 3: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	28.081	8	3.510	19.116	.000[b]
	Residual	71.796	391	.184		
	Total	99.878	399			

Source: Field survey, 2024

a. Dependent Variable: CTIPT
b. Predictors: (Constant), Real estate crowd funding, Automated property management systems, AI powered property valuation tools, Smart home technology integration, Online property auctions, Virtual tour and 3D Visualisation, Block chain in real estate transactions, Real time property existing platforms

The information revealed that with F of 19.116 and 399 degree of freedom, the test is highly significant, thus there is a linear relationship between the variables in the model.

Table 4: Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.530[a]	.281	.266	.42851

Source: Field survey, 2024

a. Predictors: (Constant), Real estate crowd funding, Automated property management systems, AI powered property valuation tools, Smart home technology integration, Online property auctions, Virtual tour and 3D Visualisation, Block chain in real estate transactions, Real time property existing platforms

b. Dependent Variable: CTIPT

The information revealed that the table provides r and r square. The R value represents simple correlation, which is 53.0 indicating a moderate correlation. While the R square of 28.1 indicates a low correlation.

Table 5: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	.235	.065		3.641	.000
	Real time property existing platforms	.137	.052	.137	2.625	.000
	Virtual tour and 3D Visualisation	-.018	.052	-.017	-.351	.067
	Online property auctions	.028	.047	-.028	-.600	.001
	Automated property management systems	.007	.048	.007	.146	.004
	Block chain in real estate transactions	-.143	.049	-.142	-2.902	.094
	AI powered property valuation tools	.105	.047	.104	2.230	.002
	Smart home technology integration	.153	.045	-.152	-3.395	.001
	Real estate crowd funding	.523	.050	.497	10.535	.000

a. Dependent Variable: CTIPT

The table revealed that a coefficient of .052 for the predictor ''Real time property existing platforms'' indicates that for every property platforms invented, there is outcome increase by .137 controlling for other predictors in the model, thus real time property existing platforms contribute significantly to the model, $p<0.05$. A coefficient of .052 for the predictor ''Virtual tour and 3D Visualization'' indicates that for every visualization made, there is a reduction in invention and outcome by.-018, making virtual tour and 3D Visualization insignificant to the model as $p>0.05$. A coefficient of 0.47 for the predictor ''Online Property Auctions'' indicates that for every online property auction, there is an outcome increase by .028, thus online property auctions contribute significantly to the model, $p<0.05$. A coefficient of 0.48 for the predictor ''Automated property management systems'' indicates that for every automated property system, there is an increase in outcome by .007, thus contributing significantly to the model, $p<0.05$. A coefficient of 0.49 for the predictor ''Block chain'' indicates that for every block chain in real estate transaction, there is reduction in outcome by -.143, thus making it insignificant to the model, $p>0.05$. A Coefficient of of 0.47 for the predictor ''AI Powered property valuation tools'' indicates that for every AI powered valuation tools, there is an increase in outcome by .105, thus contributing significantly to the model, $p<0.05$. A coefficient of .045 for the predictor ''Smart home technology integration'' indicates that for every smart home technology developed, there is an increase in outcome by .153, thus contributing significantly to the model, $p<0.05$. A coefficient of 0.50 for the predictor ''Real estate crowd funding'' indicates that for every real estate crowd funding platform, there is an increase in outcome by .523, thus contributing significantly to the model, $p<0.05$.

Table 6: Technology used by firms in Nigeria

Proptech Innovation platforms	Frequency	Percentage (%)
Real time property existing platforms	187	46.7
Virtual tours and 3D Visualization	31	7.8
Online property platform	31	7.8
Automated property management systems	31	7.8
Block chain	30	7.5
AI powered valuation tools	30	7.5
Smart home Technology Integration	30	7.5
Crowdfunding platforms	30	7.5

Source: Field survey, 2024

The table revealed the technology used by firms in Nigeria, and from the table above, real time property existing platforms rated high at 46.7%, which could be due to the fact that it offers flexible practices to small and large scale business. Virtual tours, online property platform and automated property management are also used by firms to reach out to targeted clients.

Table 7: Level of awareness and understanding

Level of awareness	Frequency	Percentage (%)
Extremely aware	115	28.5
Very aware	57	14.3
Moderately aware	57	14.3
Slightly aware	115	28.5
Not aware	57	14.3
Total	400	100.0

Source: Field survey, 2024

The information revealed the level of awareness and understanding by the respondents and majority of them were extremely and slightly aware about the knowledge of proptech innovation in Nigeria, thus confirming the validity and reliability of their responses.

Table 8: Access to information

Level of findings	Frequency	Percentage (%)
Very frequently	115	28.5
Often	57	14.3
Sometimes	57	14.3
Occasionally	115	28.5
Rarely/Never	57	14.3
Total	400	100.0

Source: Field survey, 2024

The information revealed the level at which information is known, and majority of the respondents have access to information very frequently and occasionally while the rest have access to information often, sometimes and rarely.

Table 9: Factors influencing adoption/resistance to proptech

S/N	Factors/variables	SA	A	U	D	SD	Mean score	Rank
1	Level of awareness and understanding	250(62.5)	100(25.0)	50(12.5)	-	-	4.50	2nd
2	Resistance to change	300(75.0)	100(25.0)	-	-	-	4.75	3rd
3	Limited access to Technology	-	275(68.8)	100(25.0)	25(6.2)		3.63	13th
4	Concern about data security	320(80.0)	80(20.0)	-	-	-	4.80	2nd
5	Perceived high cost	320(80.0)	50(12.5)	30(7.5)	-	-	4.72	4th
6	Lack of skilled personnel	300(75.0)	90(22.5)	10(2.5)	-	-	4.72	4th
7	Culture and Organisation	288(72.0)	112(28.0)	-	-	-	4.72	4th
8	Regulatory challenges	200(50.0)	67(16.8)	67(16.8)	24(19.5)	6(1.5)	4.45	6th
9	Perception	255(63.7)	145(36.3)	-	-	-	4.63	5th
10	Limited trust and confidence	340(85.0)	60(15.0)	-	-	-	4.85	1st

Source: Field survey, 2024

The table revealed the factors influencing adoption and resistance to proptech, Limited trust and confidence ranked 1st with a mean score of 4.85, concern about data security ranked 2nd with a mean score of 4.50, resistance to change ranked 3rd with a mean score of 4.75, perceived cost, lack of skilled personnel, culture and organization ranked 4th with a mean score of 4.72, perception about how proptech is a threat ranked 5th with a mean score of 4.67 while regulatory challenges ranked 6th with a mean score of 4.45. In as much as technology has it obvious advantages however some of its cons include data breach, fraudulent activities and security seems to be the reasons why individuals feel technology has done more harm than good. No wonder it ranked on top.

Table 10: Technology commonly used

S/N	Factors/variables	SA	A	U	D	SD	Mean score	Rank
1	Online property listings	280(70.0)	120(30.0)	-	-	-	3.70	5th
2	Virtual tour	240(60.0)	85(21.3)	75(18.8)	-	-	4.41	3rd
3	Data analytics	290(72.5)	70(17.5)	-	40(10.0)		4.53	2nd
4	E-Learning platforms	255(63.8)	45(11.3)	-	100(25.0)	-	4.14	4th
5	Property management	310(77.5)	45(11.3)	45(11.3)	-	-	4.66	1st

Source: Field survey, 2024

The information above revealed the technology commonly used, property management tools ranked 1st with a mean score of 4.66, followed by data analytics tools used to analyse, decode and present data in a meaningful form, this ranked 2nd with a mean score of 4.53, virtual tour ranked 3rd with a mean score of 4.41, E-learning platforms ranked 4th with a mean score of 4.14 while online property listings ranked 5th with a mean score of 3.70.

Table 11: Ways Technology increase efficiency

Variables	Frequency	Percentage (%)
Streamlined property search	130	32.5
Automated processes	50	12.5
Enhanced communication	100	25.0
Data driven decision making	70	7.5
Reduced paper work	50	12.5
Total	400	100.0

Source: Field survey, 2024

The information above revealed ways through which technology can increase efficiency, majority of the respondents indicated that the most significant ways is through streamlined property search, platform that allows individuals to search for any category of property in different locations; it can target clients at any parts of the world at a fast rate. This was followed by enhanced communication that allows business (small or large scale business) to reach out to clients in matters related to real estate investment.

Table 12: Key gaps present in the real estate industry

S/N	Factors/variables	SA	A	U	D	SD	Mean score	Rank
1	Digital literacy	260(65.0)	120(30.0)	-	20(5.0)	-	4.55	4th
2	Data Analytics	150(37.5)	150(37.5)	-	150(37.5)	50(12.5)	4.25	7th
3	Tech savy	300(75.0)	70(17.5)	-	30(7.5)		4.60	3rd
4	Cybersecurity awareness	266(66.5)	67(16.8)	-	67(16.8)	-	4.33	6th
5	Client management	300(75.0)	55(13.8)	45(11.3)	-	-	4.64	2nd
6	Project management	288(72.0)	60(15.0)	-	62(15.5)	-	4.51	5th
7	Regulatory compliance	350(87.5)	-	50(12.5)	-	-	4.75	1st

Source: Field survey, 2024

The table revealed the information on table 12 about the key gaps present in the real estate industry, regulatory compliance ranked 1st with a mean score of 4.75, client management ranked 2nd with a mean score of 4.64, Tech Savy ranked 3rd with a mean score of 4.60, Digital Literacy ranked 4th with a mean score of 4.55, Project management ranked 5th with a mean score of 4.51, cybersecurity ranked 6th with a mean score of 4.33 while data analytics ranked 7th with a mean score of 4.25.

Table 13: Challenges involved in proptech

S/N	Factors/variables	SA	A	U	D	SD	Mean score	Rank
1	Lack of awareness	230(57.5)	170(42.5)	-	-	-	4.58	4th
2	Limited access	184(46.0)	190(47.5)	-	13(3.25)	13(3.25)	4.29	6th
3	Complexities	350(87.5)	50(12.5)	-	-	-	4.88	2nd
4	Resistance to change	300(75.0)	100(25.0)	-	-	-	4.75	3rd
5	Regulatory challenge	170(42.5)	150(37.5)	-	40(10.0)	40(10.0)	3.93	7th
6	Cost	380(95.0)	10(2.5)	-	10(2.5)	-	4.90	1st
7	Skill gaps	230(57.5)	170(42.5)	-	-	-	4.58	4th
8	Data security and privacy	220(55.0)	160(40.0)	-	-	-	4.35	5th

Source: Field survey, 2024

The information revealed the challenges involved in proptech innovation, cost ranked 1st with a mean score of 4.90, complexities ranked 2nd with a mean score of 4.88, resistance to change ranked 3rd with a mean score of 4.75, lack of awareness and skill gaps ranked 4th with a mean score of 4.58, data security and privacy ranked 5th with a mean score of 4.35, limited access ranked 6th with a mean score of 4.29 while regulatory challenge ranked 7th with a mean score of 3.93.

Table 14: Strategies for integrating technology into real estate

Variables	Frequency	Percentage (%)
Creation of specialized courses	43	10.75
Practical exercises	57	14.25
Workshops and Seminars	43	10.75
Simulation	57	14.25
Partnerships	57	14.25
Data analytics	57	14.25
Update curriculum	43	10.75
Access to technology	43	10.75
Total	400	100.0

Source: Field survey, 2024

The table shows the strategies for integrating Technology into real estate, few of the most common ways are; practical exercises, simulation, partnerships, data analytics while the rest such as creation of specialized courses, curriculum update and access to technology added in minimal quantities.

Table 15: Strategies for integrating technology

S/N	Factors/variables	SA	A	N	D	SD	Mean score	Rank
1	Creation of specialized courses	250(62.5)	150(37.5)	-	-	-	4.63	1st
2	Practical exercises	220(55.0)	180(45.0)	-	-	-	4.55	2nd
3	Workshops and Seminars	210(52.5)	190(17.5)	-	-	-	4.53	3rd
4	Simulation	190(47.5)	150(37.5)	60(15.0)	-	-	4.33	6th
5	Partnerships	210(52.5)	180(45.0)	-	10(2.5)	-	4.47	4th
6	Data analytics	190(47.5)	150(37.5)	-	30(7.5)	30(7.5)	4.10	8th
7	Update curriculum	210(52.5)	150(37.5)	40(10.0)	-	-	4.43	5th
8	Access to technology	150(37.5)	210(52.5)	40(10.0)	-	-	4.28	7th

Source: Field survey, 2024

In continuation, using the mean score average creation of specialized courses ranked 1st with a mean score of 4.63, practical exercises ranked 2nd with a mean score of 4.55, workshops and seminars ranked 3rd with a mean score of 4.53, partnerships ranked 4th with a mean score of 4.47, updating curriculum ranked 5th with a mean score of 4.43, simulation ranked 6th with a mean score of 4.33, access to technology ranked 7th with a mean score of 4.28 while data analytics ranked 8th with a mean score of 4.28.

Table 16: Potential partnerships and collaboration

Variables	Frequency	Percentage (%)
Mentorship	100	25.0
Incubation centres	35	8.7
Internship	200	50.0
Events and conferences	45	11.3
Advisory Boards	20	5.0
Total	400	100.0

Source: Field survey, 2024

The table showed the potential partnership and collaboration that could foster real estate investment business, from the information on the table above, internship and mentorship were identified by majority of the respondents to be potential partnerships and collaboration needed to foster real estate management.

5. Conclusion

Integrating Prop Tech and innovative technologies no doubt has significant impact on real estate education and research in Nigeria and appears to have been widely adopted in the real estate sector in Nigeria. The advancements of the duo have the potential of transforming the way professionals in the real estate industry operate, which has no doubt led to more efficient processes, improved decision-making as well as increased productivity. More so, some challenges still needs to be addressed, they include; access to technology and training for professionals in the industry. Furthermore, it is crucial for educational institutions and stakeholders in the industry to continue to adapt as well as embrace these technologies in order to remain afloat with the intent to driving positive change in the Nigerian real estate market. Through the harnessing of the power of innovation, a more sustainable can be created. In addition is transparent and dynamic real estate sector that will meet the needs of a rapidly evolving real estate market.

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