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ASSESSING SMART TECHNOLOGY'S INFLUENCE ON SECURITY AND QUALITY OF LIFE IN MANAGEMENT OF RESIDENTIAL ESTATE IN PORT HARCOURT.

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ABSTRACT: *This study assesses the impact of smart technology on security, convenience, and overall quality of life in residential estates, with a focus on Freedom Residential Estate, located off SARS Road, Elikpokwuodu, Rukpokwu, Port Harcourt. Using a survey research design, the study examines residents' perceptions of smart technology's role in enhancing estate security, increasing convenience, and improving satisfaction. A total of 320 stakeholders were selected, including 300 adult residents, 10 property managers, and 10 technology vendors involved in estate management. A purposive sampling technique was employed, resulting in the retrieval of 293 questionnaires, representing a 91.5% response rate. The study employs a quantitative method to analyze the data, utilizing Likert scale ratings to gauge perceptions of smart technology's influence. The study shows a significantly high level of influence; p-value = 0.004 at a 0.05 alpha level, for adopting smart technology towards the quality of life for residents in terms of security, convenience, and overall satisfaction with their living environment of the residential estate management in Port Harcourt. The findings reveal mixed perceptions of its impact on various aspects of estate life. While smart technology is perceived as enhancing convenience and comfort (with a mean of 3.79 and RII of 0.76), its influence on security is more polarized (Mean = 3.13, RII = 0.63). The overall quality of life, however, was rated lower (Mean = 2.62, RII = 0.52), suggesting that the full potential of smart technology has yet to be realized by residents. This study concludes that while the adoption of smart technology shows promising benefits in security, convenience, and satisfaction, challenges such as inadequate implementation, insufficient user engagement, and infrastructure limitations may hinder its full effectiveness. Recommendations for improving smart technology adoption include enhancing stakeholder collaboration, securing adequate funding, ensuring data security, and adopting phased integration to increase resident satisfaction and enhance overall estate management.*

KEYWORDS: Smart Technology, Security, Quality of Life, Property Management, Resident Satisfaction.

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INTRODUCTION

The integration of smart technology into residential estates has revolutionized modern living, offering enhanced security, improved convenience, and greater resident satisfaction (Li, Zhang, and Wang, 2019). Globally, the adoption of smart home systems, ranging from automated lighting and climate control to advanced surveillance and access control, has reshaped the residential experience, addressed security concerns while promoting efficiency and comfort (Park, Lee, and Kim, 2021). In urban centers like Port Harcourt, where rapid urbanization presents unique challenges to safety and infrastructure management, smart technologies offer potential solutions to improve residential living standards (Eze and Chukwuma, 2020). Security remains one of the primary motivations behind the adoption of smart technologies in residential estates. Smart surveillance systems, biometric access control, and real-time security alerts contribute to reducing crime and enhancing residents' sense of safety (Zhao and Bai, 2018). According to Adebayo and Oladimeji (2022), estates equipped with advanced security systems report significantly lower crime rates compared to those relying on traditional methods.

Beyond security, smart technologies also contribute to convenience and energy efficiency, offering residents greater control over their living environments. Features such as remote access to home appliances, smart lighting, and energy monitoring systems streamline daily activities, reduce utility costs, and improve overall living standards (Chen, Li, and Wang, 2020). Moreover, the seamless integration of these technologies can significantly influence resident satisfaction, as they align with modern expectations for comfort and efficiency (Ghosh and Scott, 2019). Despite the global proliferation of smart technologies, there is limited research on their specific impacts within the context of Port Harcourt's residential estates. Given the city's infrastructural challenges and socio-economic diversity, understanding how smart technologies affect security, convenience, and resident satisfaction is crucial for promoting sustainable urban living (Okoro and Nwankwo, 2021). As the demand for smart home features grows, real estate developers and property managers in Port Harcourt are increasingly recognizing the value of integrating these technologies to meet the evolving expectations of residents. Therefore, it is essential to assess how these technologies influence security, convenience, and overall resident satisfaction, providing insights into how these innovations are reshaping urban living within residential estates in Port Harcourt.

Aim and Objectives

This study aims to assess the impact of smart technology and its overall contribution to improving security and quality of life in residential estates of Port Harcourt.

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LITERATURE REVIEW

Smart Technology in Residential Property Management

Smart technology refers to the use of interconnected devices and systems to automate, monitor, and manage various aspects of property operations, including energy usage, security, maintenance, and tenant communications (Zhu et al., 2021). Smart technology in property management refers to the integration of digital, automated, and intelligent systems designed to enhance the efficiency, safety, and comfort of residential environments. The concept is rooted in the broader framework of smart cities, which aim to optimize infrastructure and services through data-driven innovations (Kitchin, 2020). In residential estate management, this encompasses systems such as smart meters, surveillance cameras, biometric access controls, energy-efficient lighting, and centralized digital management platforms. These technologies are designed to streamline operational functions, reduce costs, and provide real-time monitoring capabilities for property managers and residents alike (Ghaffarian-Hoseini et al., 2021).

Role of Smart Technology in Enhancing Residential Security

One of the most critical applications of smart technologies in property management is in the area of security. The integration of smart technology into residential estates has significantly enhanced security systems, offering real-time surveillance, remote monitoring, and automated access control (Li et al., 2019). Smart security solutions, including biometric entry systems, motion sensors, and high-definition CCTV cameras, have become integral to modern housing, particularly in urban areas where safety is a major concern (Zhao and Bai, 2018). These technologies not only deter crime but also provide immediate alerts to residents and security personnel, ensuring a swift response to potential threats (Park et al., 2021). Studies have demonstrated that estates equipped with smart security systems report lower crime rates. Adebayo and Oladimeji (2022) found that smart surveillance and automated gate access reduced unauthorized entries in Nigerian residential estates by up to 40%. In Port Harcourt, where security challenges are prevalent, the adoption of smart technologies has proven effective in addressing issues like burglary and vandalism (Eze and Chukwuma, 2020). Okolie and Udechukwu (2019) investigated security systems in high-income residential areas in Lagos and Port Harcourt. They discovered that smart security technologies such as digital access control and surveillance reduced incidents of burglary and trespassing by over 40%. However, they noted that such systems were mainly implemented in affluent communities, suggesting socioeconomic barriers to wider adoption. The integration of artificial intelligence (AI) into security systems further enhances their efficiency by enabling predictive analytics and anomaly detection (Chen et al., 2020). However, despite these advancements, there are concerns regarding privacy and data security. Smart security systems often collect vast amounts of data, raising questions about how this information is stored and protected (Ghosh and Scott, 2019). Without robust cybersecurity measures, these systems may become vulnerable to hacking and unauthorized access, potentially compromising resident safety (Okoro and Nwankwo, 2021). These advancements are particularly beneficial in multi-residential properties, where integrated smart systems can streamline access and improve the overall resident experience.

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Enhancing Convenience through Smart Technology

Beyond security, smart technology plays a crucial role in enhancing daily convenience for residents. Home automation systems enable users to control lighting, temperature, and appliances remotely, leading to increased comfort and energy efficiency (Li et al., 2019). The Internet of Things (IoT) has been instrumental in creating interconnected living spaces where devices communicate seamlessly to optimize user experience (Park et al., 2021). Chen et al. (2020) highlight that smart home technologies can significantly reduce energy consumption by automating lighting and HVAC systems based on occupancy and weather conditions. In residential estates, these features contribute to lower utility costs and promote sustainable living practices. In Port Harcourt, where energy supply is often inconsistent, smart energy management systems help mitigate power outages and optimize generator usage (Eze and Chukwuma, 2020). Convenience also extends to smart community management systems that streamline interactions between residents and estate management. Applications that facilitate bill payments, maintenance requests, and community updates improve operational efficiency and foster a more connected residential environment (Ghosh and Scott, 2019). Additionally, voice-activated assistants and AI-powered home hubs simplify daily tasks, catering to residents' growing demand for efficient and user-friendly living spaces (Zhao and Bai, 2018). Smart home devices, which include smart locks, thermostats, lighting systems, and security cameras, are revolutionizing the living experience by offering increased convenience, improved security, and personalized comfort to residents.

Smart Technology Impact on Resident Satisfaction and Quality of Life

The implementation of smart technologies has a direct impact on resident satisfaction and overall quality of life. Studies show that residents in smart-enabled homes report higher levels of comfort, safety, and convenience, which contribute to enhanced well-being (Ghosh and Scott, 2019). The ability to personalize home settings, monitor security in real-time, and reduce energy costs creates a more satisfying living experience (Li et al., 2019). Adebayo and Oladimeji (2022) argue that smart technologies contribute to a sense of control and empowerment among residents, leading to increased satisfaction levels. In Port Harcourt, residents of smart estates have reported feeling safer and more comfortable, attributing this to the availability of modern amenities and efficient estate management systems (Okoro and Nwankwo, 2021). Agyeman and Ahenkan (2021) conducted a study in Accra, Ghana, which revealed that smart estate technologies significantly improved energy efficiency and resident satisfaction. Their findings suggested that estates with integrated smart utility monitoring and communication systems reported fewer service disruptions and higher ratings in tenant satisfaction surveys. Furthermore, features like smart fitness equipment, automated irrigation systems, and intelligent parking solutions enhance community living, promoting health and convenience (Chen et al., 2020). Nevertheless, resident satisfaction is not solely dependent on the availability of technology but also on its usability and reliability. Ghosh and Scott (2019) emphasize that poorly designed systems or frequent technical failures can lead to frustration, ultimately diminishing satisfaction. User education and ongoing technical support are, therefore, crucial to maximizing the benefits of smart technologies in residential settings (Zhao and Bai, 2018). Though the implementation of smart home systems is not without challenges. Concerns regarding data privacy, potential security vulnerabilities, and the initial costs of installation can impact resident satisfaction.

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Challenges in Smart Technology Adoption

Despite the numerous benefits, the adoption of smart technologies in residential estates faces several challenges. In Port Harcourt, studies have highlighted challenges in residential satisfaction, with residents expressing dissatisfaction with essential services such as electricity and water supply (Wokekoro, 2015). One of the primary barriers is the high initial cost of installation and maintenance. Smart security systems, energy management tools, and home automation devices require significant investment, which may deter developers and homeowners, particularly in emerging markets like Nigeria (Eze and Chukwuma, 2020). Technical complexities and interoperability issues also pose challenges. Many smart devices operate on different platforms, leading to compatibility issues that hinder seamless integration (Chen et al., 2020). Without standardized protocols, residents may struggle to connect and manage multiple devices efficiently, resulting in underutilization of smart features (Park et al., 2021).

Privacy and data security concerns further complicate smart technology adoption. As these systems collect sensitive personal data, ensuring its protection against cyber threats is paramount (Zhao and Bai, 2018). Data breaches and hacking incidents can compromise resident safety, leading to distrust and reluctance to adopt smart technologies (Okoro and Nwankwo, 2021). Additionally, limited technological literacy among residents can impede effective utilization of smart systems. Ghosh and Scott (2019) argue that without proper training and user-friendly interfaces, residents may find it challenging to operate these systems, leading to dissatisfaction. In Port Harcourt, the lack of widespread awareness and education about smart technologies has slowed their adoption, particularly in middle-income residential estates (Adebayo and Oladimeji, 2022). Challenges such as high installation costs, data privacy concerns, and inconsistent internet infrastructure in regions like Port Harcourt pose barriers to widespread adoption (Tracxn, 2025). However, local startups are innovating cost-effective and context-specific solutions to overcome these hurdles (Remtronic Automations, 2025).

2.6 Identified Benefits of Smart Technology Application to Property Management

Future advancements in AI and machine learning are expected to further enhance the capabilities of smart property management systems. Predictive analytics and personalized tenant experiences are among the emerging trends that will shape the future of the industry (Morris et al., 2022). The integration of smart technology into property management offers numerous benefits, including (Johnson and Li, 2021):

Enhanced Operational Efficiency: Smart technology streamlines property management processes by automating routine tasks. For example, smart locks and keyless entry systems eliminate the need for physical keys, reducing administrative overhead and improving tenant convenience (Chen et al., 2020). Similarly, property managers can use IoT-enabled sensors to monitor building systems such as HVAC, lighting, and plumbing, allowing for predictive maintenance and minimizing downtime (Kapoor and Anand, 2021). This real-time monitoring ensures that issues are detected and addressed before they escalate, improving the overall efficiency of property operations.

Cost Savings and Financial Benefits: The adoption of smart technology can lead to significant cost savings for property owners and managers. Smart energy management systems optimize energy consumption by automatically adjusting heating, cooling, and lighting based on occupancy and usage patterns (Smith and Brown, 2020). According to a study by Johnson

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and Li (2021), properties equipped with smart energy systems reported energy cost reductions of up to 30%. Additionally, predictive maintenance enabled by IoT sensors reduces repair costs and prolongs the lifespan of property assets. Smart technology also enhances rent collection processes through automated payment systems. Tenants can pay rent online, and reminders can be sent automatically, reducing the likelihood of late payments (Morris et al., 2022). These systems improve cash flow and reduce the administrative costs associated with manual rent collection.

Improved Tenant Satisfaction: Tenant satisfaction is a critical factor in property management, and smart technology plays a vital role in enhancing the tenant experience. Smart home features, such as voice-controlled assistants, programmable thermostats, and automated lighting systems, provide tenants with convenience and customization options (Kapoor and Anand, 2021). Furthermore, mobile apps for tenant communication allow residents to report issues, schedule maintenance, and access property updates seamlessly, fostering a positive landlord-tenant relationship (Chen et al., 2020). The security features of smart technology, such as surveillance cameras, smart locks, and alarm systems, also contribute to tenant satisfaction by creating a safer living environment (Zhu et al., 2021). These measures enhance tenants' sense of security, which is a key factor influencing their decision to renew leases.

Sustainability and Environmental Benefits: Smart technology contributes to sustainable property management practices by reducing energy consumption and minimizing waste. Smart thermostats and energy-efficient lighting systems lower the environmental footprint of properties while also reducing utility bills (Smith and Brown, 2020). Water management systems, such as smart irrigation and leak detection technologies, further support sustainability goals by optimizing water usage and preventing wastage (Johnson and Li, 2021). Sustainability initiatives not only align with global environmental goals but also enhance the marketability of properties. A growing number of tenants prioritize eco-friendly features when selecting rental properties, making smart technology an essential investment for property owners (Morris et al., 2022).

Increased Property Value: The integration of smart technology adds significant value to residential and commercial properties. Smart buildings are perceived as more modern and attractive, leading to higher occupancy rates and rental income (Zhu et al., 2021). Moreover, properties with advanced technological features are often appraised at higher values, providing a competitive edge in the real estate market (Kapoor and Anand, 2021). Real estate investors and developers increasingly recognize the long-term benefits of smart technology in enhancing asset value. According to Chen et al. (2020), properties equipped with smart systems achieved resale values 15–20% higher than comparable non-smart properties.

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RESEARCH METHODOLOGY

The study assesses smart technology's influence on security, convenience, and resident satisfaction in Port Harcourt Residential Estates. A survey research design is employed, focused on selecting Freedom Residential Estate off SARS Road, Elikpokwuodu, Rukpokwu in Port Harcourt. This study approach is suitable for in-depth exploration of the context-specific applications and impacts of smart technology. Survey Questionnaires were developed and administered, collecting data from residents and estate managers regarding their satisfaction levels and perceived benefits of smart technologies. The study adopts a quantitative method of data collection and analysis to assess the influence of smart technology on security, convenience, and resident satisfaction, selecting Freedom Residential Estate off SARS Road, Elikpokwuodu, Rukpokwu in Port Harcourt, and explores stakeholder perceptions. The target population for the study comprises 320 stakeholders involved in property management: 300 Adult residents were purposively selected from the 300 residential buildings in the estate, 10 property managers, and 10 technology vendors who are stakeholders involved in property management within residential estates in Port Harcourt, Nigeria. Purposive sampling was carried out with a total of 320 questionnaires administered to the respondents (residents, property managers, and technology vendors); 293 copies of questionnaires were retrieved, representing a 91.5% response rate of the total population, which is considered sufficient for the study. Data collected for the study were presented and analyzed through the use of tables, percentages, mean, and relative importance index (RII). With the use of Likert scale, respondent's opinion on the influence of smart technology on security, convenience, and resident satisfaction in residential estates of Port Harcourt, Rivers State Nigeria was obtained and they were asked to score the impact factors associated with integration smart technology practice on residential estates, according to the degree of response: strongly agree with 5 points, agree with 4 points, Indifferent with 3 points, and disagree with 2 points and strongly disagree with 1 point.

DATA PRESENTATION AND ANALYSIS

Influence of Smart Technology on the Quality of Life *for Residents in the Estate*

Table 1 shows smart technology influences the quality of life for residents in terms of security, convenience, and overall satisfaction with their living environment. Table 1 analyzes residents' perceptions of how smart technology influences their quality of life in the estate. Each aspect of smart technology is rated based on mean score, standard deviation, and Relative Importance Index (RII). Rankings indicate the perceived influence of each aspect, with perceptions classified as high, moderate, or low based on a weighted mean threshold of 3.37.

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Table 1: Influence of Smart Technology on the Quality of Life *for Residents*

Smart Technology Aspects	Weigh: N=293					Mean	Std	RII	Rank	Decision
	1	2	3	4	5					
Smart technology improves the overall security of the estate.	98	42	0	30	123	3.13	1.8	0.63	6	Low Perception
The convenience provided by smart technology enhances resident satisfaction.	36	54	26	78	99	3.51	1.43	0.70	4	High Perception
Smart technology makes daily living more comfortable and efficient.	36	27	47	36	147	3.79	1.45	0.76	2	High Perception
Residents feel safer with smart technology implementations.	54	36	26	36	141	3.59	1.6	0.72	3	High Perception
Overall quality of life in the estate is better with smart technology.	98	66	36	36	57	2.62	1.53	0.52	8	Low Perception
Smart technology enhances the connectivity and communication within the community.	98	30	24	60	81	2.99	1.66	0.60	7	Low Perception
The use of smart technology reduces the time and effort needed for routine tasks.	36	27	18	65	147	3.89	1.43	0.78	1	High Perception
Smart technology contributes to a more environmentally friendly living environment.	72	32	12	60	117	3.40	1.66	0.68	5	Moderate Perception

Note: N =293, Weighted Mean = 3.37; Perception is considered "High" if the mean is above the weighted mean

Source: *Author's Field Survey, 2024.*

Reduction in Time and Effort for Routine Tasks: This aspect ranks the highest, with a mean score of 3.89, a standard deviation of 1.43, and an RII of 0.78. A large portion of residents (50.2%) strongly agree, and 22.2% agree that smart technology significantly reduces the time and effort required for daily tasks, indicating a high perception that smart technology enhances efficiency in residents' lives.

Comfort and Efficiency in Daily Living: Rated second, this aspect has a mean score of 3.79 and a standard deviation of 1.45, with 50.2% of residents strongly agreeing that smart technology contributes to comfort and efficiency. This high perception suggests that residents see value in smart technology's ability to make daily routines smoother and more manageable.

Enhanced Safety Perception: The perceived improvement in safety due to smart technology ranks third, with a mean score of 3.59 and a high perception. With 48.1% strongly agreeing and another 12.3% agreeing, residents feel that the presence of smart technology bolsters their

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sense of security within the estate, even if security improvements are not universally acknowledged.

Increased Convenience and Satisfaction: This aspect has a mean score of 3.51, ranking fourth, with 33.8% of residents strongly agreeing and 26.6% agreeing that smart technology enhances convenience, which in turn positively impacts their satisfaction. The high perception score here highlights that convenience is a significant benefit that residents experience from smart technology.

Environmental Friendliness: Residents perceive a moderate positive impact from smart technology on creating an environmentally friendly living environment, with a mean score of 3.40 and a standard deviation of 1.66. Ranked fifth, 39.9% of residents strongly agree, and 20.5% agree that smart technology contributes to sustainability, though opinions vary.

Improvement in Estate Security: Surprisingly, while smart technology is expected to enhance security, this aspect ranks lower, with a mean score of 3.13 and a low perception rating. Although 42% strongly agree on improved security, a significant 33.4% strongly disagree, reflecting a divide among residents on whether smart technology effectively improves estate security.

Connectivity and Communication within the Community: This aspect ranks seventh, with a mean score of 2.99 and a standard deviation of 1.66. While 27.6% strongly agree on improved communication and connectivity due to smart technology, 33.4% strongly disagree, indicating that many residents feel connectivity benefits may not yet be fully realized or apparent.

Overall Quality of Life: The impact of smart technology on the overall quality of life has the lowest rating, with a mean score of 2.62 and a low perception ranking. A substantial portion (33.4%) of residents strongly disagree that smart technology has significantly enhanced their overall quality of life, suggesting skepticism about its broader impact despite its perceived benefits in specific areas.

The findings reveal that residents recognize significant benefits of smart technology in reducing time and effort, enhancing convenience, and improving safety and efficiency in daily life. However, opinions are mixed regarding its impact on security, connectivity, and overall quality of life, indicating that while specific functionalities are appreciated, the broader quality-of-life enhancements may require further integration or clearer communication of benefits. Addressing these mixed perceptions could enhance acceptance and maximize the positive impact of smart technology on residents' lives.

Key Smart Technologies in Use for Residential Property Management

Table 2 shows the key smart technologies in use for managing the Freedom residential estate in Port Harcourt. As detailed in Table 2; more than half of the respondents with mean score of >3.00 agree that smart security systems, smart energy management systems, automated maintenance systems, property management software, smart waste management systems, IOT-enabled appliances and devices, and smart parking systems the key smart technologies in use for managing Freedom residential estate in Port Harcourt.

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Table 2: Smart Technologies in Use

Table 3: Results of the Independent Sample T-Test on Adopting Smart Technology and Residents' Satisfaction Level

Variables	N	Mean	SD	DF	P- value	Remark
Adoption of Smart Technology	51	222.012	1.0098	190	0.004	Significant
Resident's Level of Satisfaction	51	235.302	1.2004			

P<0.05 at 0.05 alpha level

Source: Author's Field Survey, 2024.

DISCUSSION OF FINDINGS

Influence of Smart Technology on the Quality of Life for Residents in Estates

From the results in Tables 1 and 3, the findings on the influence of smart technology on the quality of life for residents in Freedom Estate, Port Harcourt, provide a nuanced understanding of its impact on security, convenience, and overall satisfaction. The finding reveals mixed perceptions of the influence of smart technology on residents' quality of life in terms of security, convenience, and overall satisfaction. The discussion of these findings, as detailed in Table 1, includes:

Improvement in Security: Smart technology's impact on improving the overall security of the estate received a **low perception** (Mean = 3.13, RII = 0.63, Rank = 6). A significant proportion of residents (33.4%) strongly disagreed, while 42.0% strongly agreed. The safety perceptions of the respondents are high, but the broader view of security improvement is less convincing, with 33.4% strongly disagreeing. This polarized perception suggests that while some residents feel secure due to smart technology, others may not perceive significant benefits, possibly due to inadequate implementation or insufficient awareness of its features. This contrasts with studies such as Zhao et al. (2020), where integrated smart security systems were seen as transformative for estate security.

Enhancing Convenience and Satisfaction: The convenience provided by smart technology (Mean = 3.51, RII = 0.70, Rank = 4) and its contribution to making daily living more comfortable and efficient (Mean = 3.79, RII = 0.76, Rank = 2) received high perceptions. Similarly, the use of smart technology to reduce routine task effort was the highest-rated aspect (Mean = 3.89, RII = 0.78, Rank = 1). From the result, over 60% of residents agree that smart technology increases satisfaction due to convenience. Residents appreciate the convenience and efficiency brought by smart technology, underscoring its practical benefits in daily life. These aspects resonate well with global trends emphasizing smart technology's role in enhancing lifestyle convenience (Zhou et al., 2021). Similar findings in Nguyen et al. (2019) show that convenience, particularly through remote control capabilities, positively impacts satisfaction levels.

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Safety Perceptions: The perception that residents feel safer with smart technology implementations received a high perception (Mean = 3.59, RII = 0.72, Rank = 3), though 18.4% strongly disagreed. From the result, safety perceptions are high, the broader view of security improvement is less convincing, with 33.4% strongly disagreeing. As most residents recognize an increased sense of safety, some level of dissatisfaction persists, possibly due to lapses in system reliability or concerns over privacy and data security. This contrasts with studies such as Zhao et al. (2020), where integrated smart security systems were seen as transformative for estate security.

Overall Quality of Life: The perception that smart technology improves the overall quality of life in the estate received a **low perception** (Mean = 2.62, RII = 0.52, Rank = 8). The lowest-ranked aspect, with 33.4% strongly disagreeing and only 19.5% strongly agreeing. This low ranking suggests that while specific aspects of smart technology are valued, its cumulative impact on quality of life is not fully recognized. This could be attributed to incomplete integration or a mismatch between resident expectations and outcomes. This contrasts sharply with findings by Kim and Park (2019), where smart technology was linked to significant improvements in quality of life in communities with higher levels of integration and user engagement.

Connectivity and Communication: The enhancement of connectivity and communication within the community through smart technology was rated low (Mean = 2.99, RII = 0.60, Rank = 7). Perception of connectivity enhancements is low, with 33.4% strongly disagreeing. This finding suggests that the potential of smart technology to improve community interactions and information sharing is underutilized. Research by Ahmed et al. (2021) also notes that fragmented or poorly integrated systems can fail to deliver seamless connectivity.

Environmental Benefits: Smart technology's contribution to a more environmentally friendly living environment received a moderate perception (Mean = 3.40, RII = 0.68, Rank = 5). Opinions on environmental benefits are moderate, with 39.9% strongly agreeing and 20.5% agreeing. The residents acknowledge environmental benefits, such as energy efficiency, but the potential for greater ecological impact is not fully realized. Research by Green and Adams (2021) highlights the role of smart technology in reducing energy consumption and waste. The moderate perception suggests that environmental awareness or visibility of these benefits may be lower compared to findings in regions with stronger sustainability initiatives.

As presented in Tables 1, 2, and 3, the findings suggest that residents of Freedom Estate perceive the influence of smart technology positively in areas such as convenience, safety, and comfort. However, broader aspects like overall quality of life and connectivity remain underwhelming. These findings align with global research emphasizing the benefits of automation and safety but diverge in areas like security perception and overall quality of life, likely due to implementation gaps, user engagement levels, or infrastructure limitations in the estate. Addressing these gaps could enhance the adoption and effectiveness of smart technologies in the community.

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CONCLUSION AND RECOMMENDATIONS

This study assessed the influence of smart technology on security, convenience, and resident satisfaction in residential estates of Port Harcourt. The study has highlighted the critical influence of smart technology in addressing the inefficiencies and challenges in the property management of residential estates in Port Harcourt. Despite several challenges to adopting smart technology in the property management of residential estates, the study identified factors influencing adoption of Smart technology, including security, comfort and efficiency, improving quality of life for residents, safety, connectivity and communication, and environmental benefits. The findings indicate a significant level of satisfaction among residents with the current state of property management. As the integration of smart technology presents transformative potential, it offers benefits such as cost savings, improved communication, enhanced resource management, greater efficiency, proactive maintenance through fault detection, and strengthened security with real-time updates. These advancements in smart technology not only attract new residents but also elevate the overall quality of life, fostering comfort, safety, connectivity, and environmental sustainability within residential estates. Adopting smart technology in residential estate management necessitates a strategic approach that encompasses collaboration among stakeholders, securing adequate funding, ensuring robust data security, implementing phased rollouts, providing comprehensive staff training, incorporating residents' feedback, and adopting iterative improvements.

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