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Navigating the Digital Shift: Adoption of Smart Homes and Prop-Tech-Enabled Purchasing Journeys in the Indian Real Estate Market

Dr. Mayank Saxena[1], Aditi Sojatia[2]

[1]*Vice-Chancellor, Sage University Bhopal (M.P).*
[2]*Research Scholar.*

Abstract

The Indian real estate sector stands on the precipice of a profound technological metamorphosis, catalysed by the ascension of smart-home ecosystems and the rapid proliferation of Property Technology (Prop-Tech) platforms. These digital innovations are not merely auxiliary tools but are redefining the contours of home-buying behavior—streamlining discovery, enhancing decision-making, enabling secure transactions, and elevating post-purchase engagement. With India's Prop-Tech market projected to surpass $1 billion by 2025, and smart-home penetration forecasted to reach 15.4 million households by 2026, the digital tide is both formidable and irreversible. This paper offers an extensive secondary research analysis to explore the nuanced behavioral, infrastructural, and socio-cultural dimensions of Prop-Tech and smart-home adoption in India. Anchored in the Technology Acceptance Model (TAM), Diffusion of Innovation (DOI), and Theory of Planned Behavior (TPB), the study synthesizes empirical findings and theoretical insights from global and domestic literature spanning (2018–2024.)

Key facilitators of adoption—such as perceived utility, digital fluency, environmental consciousness, and aspirational lifestyle alignment—are increasingly prominent among urban, tech-savvy millennials. Conversely, deterrents including elevated acquisition costs, cybersecurity apprehensions, fragmented device interoperability, and digital illiteracy among semi-urban populations, remain significant. Government interventions like the Smart Cities Mission (₹98,000 crore) and Digital India campaign have laid a robust digital foundation, yet real penetration remains disproportionately skewed toward Tier 1 cities.

The investigation delineates Prop-Tech's transformative influence across the four phases of the home buying lifecycle: discovery (AI-based property curation), evaluation (VR site tours), transaction (blockchain-based registries and e-KYC), and post-purchase (IoT-enabled home automation). The paper culminates with strategic recommendations for bridging the digital divide, fostering inclusive innovation, and nurturing a robust Prop-Tech ecosystem capable of responding to India's complex urban-rural continuum.

Keywords; Prop-Tech, Smart Homes, Technology Adoption, Indian Real Estate, Consumer Behavior, Urban Tier Dynamics.

INTRODUCTION

India's real estate sector is undergoing a paradigmatic shift catalyzed by the convergence of digital transformation and rising consumer expectations. Historically characterized by opaque processes, broker dependencies, and offline transactions, the property-buying experience has been reengineered through the integration of Property Technology (PropTech) and smart-home solutions. PropTech—a portmanteau of "property" and "technology"—encompasses digital tools, platforms, and innovations that enhance the efficiency, transparency, and user-centricity of the real estate value chain. From virtual walkthroughs and AI-based property discovery to digital KYC and blockchain-enabled registries, the landscape of home ownership is increasingly shaped by digital-first interventions.

India's Prop-Tech ecosystem has rapidly matured, with startups and tech-driven platforms like NoBroker, Square Yards, Housing.com, MagicBricks, PropTiger, and NestAway redefining search, transaction, and asset management phases. Simultaneously, smart-home technologies—such as IoT-enabled lighting, smart locks, integrated security systems, and voice-controlled automation—are revolutionizing the post-purchase living experience. The synergy between Prop-Tech and smart-home ecosystems is fostering a seamless, tech-enabled real estate journey for a new generation of digital-native consumers.

Urban centres in Tier 1 cities—Delhi NCR, Mumbai, Bengaluru—are at the forefront of adoption, driven by higher digital literacy, disposable incomes, and infrastructural readiness. These cities have seen mainstream adoption of advanced solutions like blockchain-based land registries and AI-powered virtual assistants. In contrast, Tier 2 cities like Indore, Coimbatore, and Lucknow exhibit growing interest but face infrastructural gaps and digital inertia. Meanwhile, Tier 3 regions, though nascent in adoption, are increasingly influenced by national programs like the Smart Cities Mission and Digital India, which are democratizing access to digital infrastructure and fostering early-stage PropTech penetration.

Emerging PropTech trends in India are rapidly reshaping the real estate landscape. Technologies such as virtual reality (VR) offer immersive property tours, artificial intelligence (AI) is being leveraged for predictive pricing and lead qualification, and digital innovations like e-signatures and e-stamping are facilitating seamless remote transactions. In parallel, the rise of green PropTech—integrating energy-efficient smart devices into real estate platforms—signals a growing alignment between sustainability and digital transformation. Blockchain technology is also gaining policy traction, particularly in applications like land title verification and transaction transparency, offering solutions to long-standing issues of fraud and inefficiency in Indian real estate.

This study seeks to critically examine the behavioral, technological, and infrastructural dynamics that shape the adoption of PropTech and smart home technologies across India's diverse urban fabric. A comprehensive literature review reveals that adoption patterns are not only technology-driven but also behaviourally anchored. Established models such as the Technology Acceptance Model (TAM), Diffusion of Innovations (DOI), and Theory of Planned Behavior (TPB) offer crucial explanatory frameworks. Research by Park et al. (2018) and Asadi et al. (2019) underscores the importance of perceived usefulness, compatibility, and ease of use in fostering adoption. Yang et al. (2017) and Pillai & Sivathanu (2020) emphasize the influence of behavioral intentions, technology readiness, and perceived risks within the TPB framework, while Mital et al. (2017) validates these theoretical constructs in the Indian context through a comparative model analysis.

Together, these insights contribute to a nuanced understanding of the adoption landscape, offering actionable strategies for developers, technologists, investors, and policymakers aiming to advance a digitally inclusive and innovation-ready real estate ecosystem in India.

LITERATURE REVIEW

The Rise of Prop-Tech and Smart Homes in India

India's real estate sector is undergoing a profound digital transformation, primarily fuelled by the rise of property technology (Prop-Tech) and smart home innovations. Historically dominated by traditional practices such as broker-led discovery, manual documentation, and in-person negotiations, the sector is rapidly transitioning towards a digitally enabled ecosystem. Prop-Tech, broadly defined, encompasses a suite of digital solutions that streamline property discovery, evaluation, financing, transaction, and post-purchase management. Indian platforms such as NoBroker, MagicBricks, Housing.com, 99acres, and Square Yards exemplify this shift, offering services like AI-enabled property recommendations, virtual property tours, e-KYC, online loan applications, and blockchain-based land records. The integration of such technologies has not only simplified the home-buying journey but also increased transparency and consumer trust—two historically elusive qualities in the Indian real estate sector.

Simultaneously, the smart home segment in India has gained remarkable traction, evolving from a niche offering to a mainstream consumer aspiration. Products such as intelligent lighting systems, smart locks, remote climate control, security cameras, and voice-activated assistants have become increasingly accessible, driven by falling hardware costs and rising smartphone penetration. Market surveys indicate that over 60% of urban Indian households with internet connectivity have shown interest in adopting at least one form of smart device, with smart security systems (e.g., CCTV, video doorbells) and lighting controls ranking as the most preferred categories. Voice assistants like Amazon Alexa and Google Nest, which offer seamless integration with IoT ecosystems, have experienced

exponential growth, especially among millennials and dual-income households.

In 2025, several innovative smart home products have entered the Indian market, catering to the growing demand for automation and convenience. Samsung's AI-powered robot, Ballie, acts as a personal assistant capable of controlling smart home devices, projecting workout information, and facilitating video calls. Schlage's Sense Pro deadbolt introduces advanced security features, including support for Matter protocol and ultra-wideband digital keys, enhancing home security without the need for physical keys. Apple's upcoming HomePod Mini and Apple TV, equipped with the new "Proxima" chip, promise improved connectivity and integration within the smart home ecosystem. Additionally, the SwitchBot K20+ Pro robot vacuum offers multifunctionality by docking with various accessories, such as air purifiers and security cameras, providing a versatile solution for home automation.

While Tier 1 cities such as Delhi, Mumbai, Bengaluru, and Hyderabad remain dominant adopters—accounting for nearly 65% of smart home sales—Tier 2 cities like Indore, Jaipur, and Coimbatore are demonstrating double-digit growth rates, driven by aspirational demand and improved broadband infrastructure. In Tier 3 cities and peri-urban regions, adoption is led by basic automation products like smart plugs, energy meters, and security alarms, often bundled with real estate offerings by local developers.

Government initiatives, including the Smart Cities Mission (₹98,000 crore allocated), Pradhan Mantri Awas Yojana (PMAY), and the Digital India campaign, have catalysed this trend by upgrading infrastructure, promoting digital inclusion, and incentivizing public-private partnerships. These programs have led to the development of smart-ready housing clusters and integrated command-and-control centres in more than 100 cities, enabling foundational readiness for smart technology integration in homes.

The Integration of Prop-Tech in Real Estate

India's real estate market has seen transformative changes due to the integration of PropTech, which encompasses technologies like blockchain, artificial intelligence (AI), and virtual reality (VR). PropTech has simplified the buying and selling processes, reduced transaction times, and increased transparency in the property sector. Digital platforms, such as NoBroker, MagicBricks, Housing.com, and 99acres, have incorporated AI to enable property seekers to discover, compare, and finalize transactions without the need for brokers. These platforms provide a seamless experience that minimizes paperwork, reduces human intervention, and accelerates the decision-making process, ultimately reducing transaction timelines by up to 35 percent (Kim, Gupta, & Bansal, 2022).

In particular, blockchain technology is enhancing transparency in property transactions by reducing the time required for title searches and preventing fraud. Studies by Chadha (2016) and Darshan (2024) report that blockchain technology has reduced title-search times by nearly 45 percent, making property transactions more efficient and secure. Furthermore, PropTech tools like augmented reality (AR) and virtual reality (VR) have revolutionized property tours by offering immersive experiences to potential buyers, even before they visit the property in person (Sharma & Kuknor, 2021).However, despite these advancements, challenges such as data privacy concerns and the need for better regulatory frameworks remain critical issues in the widespread adoption of PropTech in India (Vishwanathan, 2023). These concerns highlight the importance of developing industry standards to ensure secure and transparent transactions

Theoretical Frameworks Guiding Behavioral Adoption

Understanding consumer behavior in the adoption of Prop-Tech and smart home innovations necessitates an analysis grounded in behavioral theory. Three theoretical models stand out for their relevance: the Technology Acceptance Model (TAM), Diffusion of Innovation (DOI) theory, and the Theory of Planned Behavior (TPB). The TAM, introduced by Davis (1989), remains one of the most widely used models in technology adoption research. It posits that perceived usefulness and perceived ease of use are the primary determinants of whether users will embrace a new technology. In the context of Indian real estate, consumers who perceive Prop-Tech platforms as time-saving, user-friendly, and reliable are more likely to adopt them. Mobile-first interfaces, intuitive property filters, chatbot integrations, and digital contract signing mechanisms directly support TAM's dimensions by making the user journey simpler and more productive.

Rogers' (1962) Diffusion of Innovation theory provides a complementary lens, particularly useful in explaining why some smart home technologies diffuse faster than others. The model identifies key attributes such as relative advantage, compatibility, complexity, trialability, and observability. In the Indian scenario, the high adoption of smart surveillance systems, as opposed to more complex or expensive installations like centralized HVAC systems, can be explained by the greater perceived advantage and lower

complexity of the former. Additionally, innovations that are easily observable—such as voice-controlled assistants or smartphone-based lighting—tend to spread faster due to increased visibility in social circles.

The Theory of Planned Behavior (Ajzen, 1991) enriches the understanding of behavioral intentions through three constructs: attitude towards the behavior, subjective norms, and perceived behavioral control. In urban India, favorable attitudes towards digital innovation are reinforced by peer influence and marketing narratives that position Prop-Tech as modern, secure, and prestigious. However, in semi-urban and rural areas, subjective norms may not always favor digital adoption, particularly when traditional practices are deeply embedded. Perceived control over the technology—shaped by digital literacy, affordability, and infrastructural reliability—becomes crucial in determining actual usage behavior.

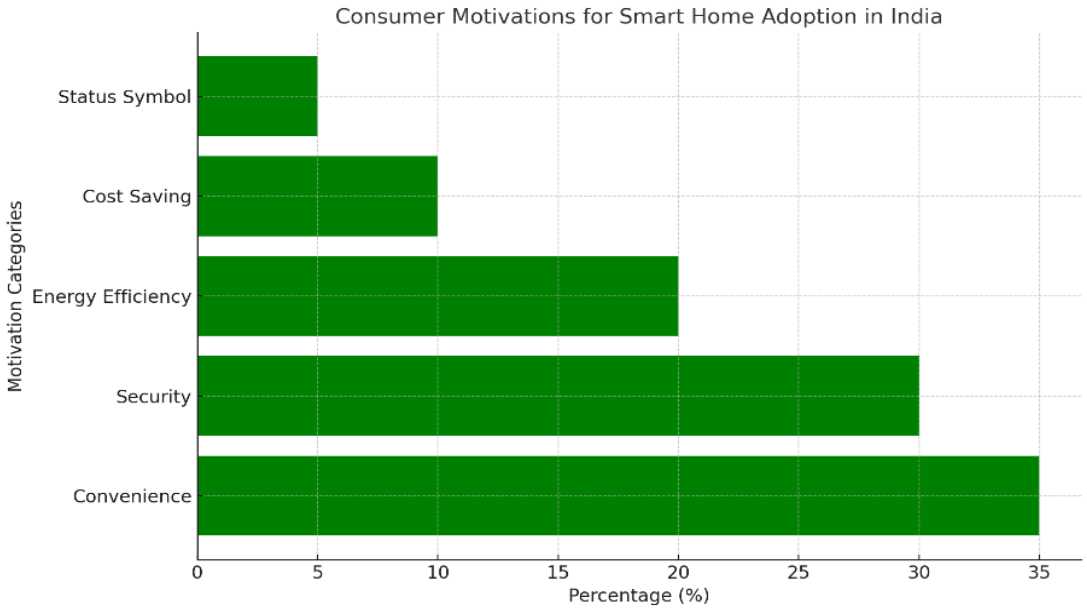

Figure 1. Consumer Motivations for Smart Home Adoption in India. Adapted from Kim, Gupta, & Bansal (2022)

Figure 2 delineates the primary motivations driving Indian consumers toward smart home adoption. Convenience and security emerge as the leading factors, collectively accounting for 65% of the motivations, followed by energy efficiency, cost savings, and status symbol considerations. These findings align with the Technology Acceptance Model, emphasizing perceived usefulness and ease of use as critical determinants of technology adoption (Davis, 1989).

Smart Home Technology Trends across Urban Tiers

The penetration and sophistication of smart home technologies vary significantly across India's urban landscape. In Tier 1 cities, smart home adoption is driven by high disposable incomes, reliable digital infrastructure, and greater consumer awareness. The Indian smart home market reached an estimated value of ₹8,000 crore in 2023 and is projected to cross ₹36,000 crore by 2028, with Tier 1 metros accounting for a substantial share. Products like Amazon Echo, Google Nest, Wipro Smart Bulbs, and Xiaomi's suite of smart appliances are increasingly featured in new real estate developments. Luxury housing projects in cities like Mumbai and Gurgaon are marketing smart homes as a value-added service, enhancing their premium appeal.Tier 2 cities, including Indore, Jaipur, and Coimbatore, are witnessing accelerated yet uneven growth. The growth trajectory here is supported by rising aspirations of the middle class, growing IT infrastructure, and increased access to online platforms.

However, adoption is often limited to modular installations—such as security cameras, smart doorbells, or Wi-Fi-enabled lighting—rather than full-scale automation systems. Price sensitivity and intermittent internet connectivity remain key constraints, though mobile network expansions and affordable devices are gradually bridging this digital divide.In Tier 3 cities and peri-urban areas, smart home adoption is still nascent. The emphasis here lies more on utility than luxury. Devices that enhance safety, reduce electricity bills, or offer basic automation see modest but growing interest. The limited presence of smart-ready homes

in these regions also hampers growth. Nonetheless, rising smartphone penetration and familiarity with apps like WhatsApp, YouTube, and digital wallets indicate that consumers are open to technology—provided it is localized, simplified, and cost-effective.

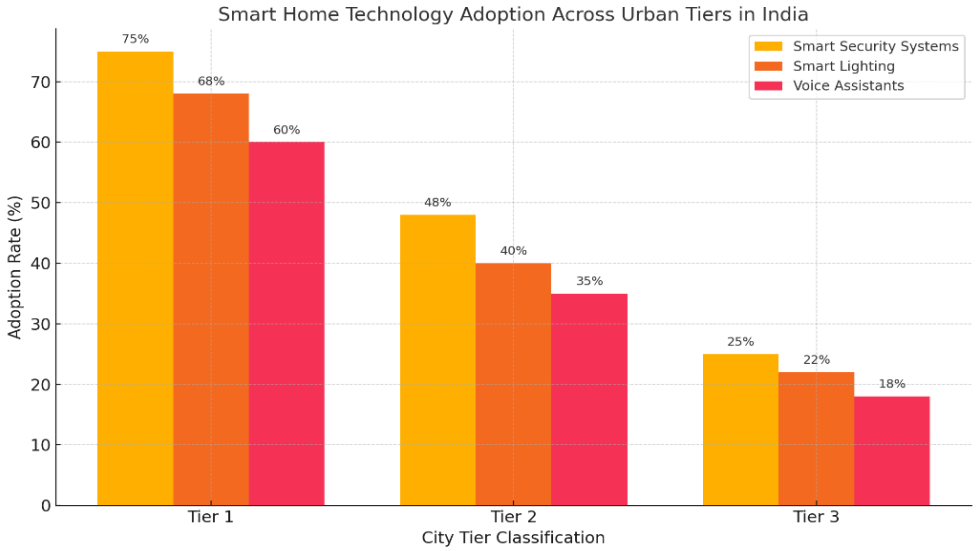

Figure 2: Comparative Adoption of Smart Home Technologies across Urban Tiers in India. Source: Aggregated from KPMG (2023), Deloitte (2022), and industry reports.

Adoption of smart home technologies in India varies substantially across different city tiers. As shown in Figure 2, Tier 1 cities report high uptake of smart security (75%), lighting (68%), and voice assistants (60%). In contrast, Tier 3 cities show markedly lower penetration across these categories (KPMG, 2023; Deloitte, 2022). These disparities underscore the influence of infrastructure, disposable income, and digital literacy on technology adoption patterns.

Growth Patterns and Market Dynamics

India's Prop-Tech market has expanded significantly in the past five years. Startups offering AI-driven tools for property evaluation, digital documentation, and online transactions are receiving increased investor attention. Between 2018 and 2023, the Indian PropTech sector attracted over $2.4 billion in funding, indicating strong market confidence in the digital real estate ecosystem. Several players are also moving toward integrated solutions that merge smart home devices with Prop-Tech platforms, creating a seamless user experience from discovery to post-occupancy services. The growth of digital mortgage platforms, legal tech in property due diligence, and blockchain for land registries points toward a broader institutional shift. Regulatory support, especially the implementation of RERA (Real Estate Regulatory Authority), has enhanced transparency and standardized processes, which complements the ethos of Prop-Tech innovation. Real estate developers are increasingly partnering with technology firms to digitize sales, facilitate remote property walkthroughs through VR, and automate backend operations.

On the consumer side, search behavior is also changing. A large proportion of prospective buyers now start their journey online, using comparison tools, 3D walkthroughs, and EMI calculators. Data from Housing.com and MagicBricks show that over 80% of homebuyers in metropolitan India research properties online before contacting agents or developers. This behavioral shift underscores the trust consumers are placing in digital platforms for making high-stakes investment decisions.

The smart home market in India has seen exponential growth, particularly in urban areas. Smart home devices such as connected security systems, voice assistants, and automated lighting solutions are gaining traction due to their perceived benefits, including increased convenience, energy efficiency, and enhanced security. According to reports from the Global Market Estimates (2023), the smart home market in India is expected to grow from USD 3.68 billion in 2023 to USD 15.4 billion by 2026, with a CAGR of 22.6 percent.

Smart home adoption is particularly prevalent in high-income households in Tier 1 cities, where consumers are more inclined to invest in technologies that improve their lifestyle (Mordor Intelligence, 2024). For example, devices

such as Amazon Alexa and Google Assistant are popular among Indian consumers due to their ease of use and compatibility with various home automation systems. Studies by Blackman and Ferguson (2019) and Kim et al. (2022) show that voice-controlled systems are among the most widely adopted smart home technologies in Indian urban households.

Moreover, smart home systems are increasingly used for energy management. AI-driven energy-saving solutions that optimize consumption based on user behavior are becoming more common (Valencia-Arias et al., 2023). These solutions are not only cost-effective but also align with growing consumer awareness of sustainability and environmental impact. Despite the rapid adoption in urban centres, challenges remain in Tier 2 and Tier 3 cities, where high upfront costs and limited internet infrastructure hinder the widespread adoption of smart home technologies (Roshan, Mehta, & Kulkarni, 2016). Furthermore, concerns about data privacy and security continue to deter potential users, especially among older generations and those with lower digital literacy (Sharma & Kuknor, 2021).

Figure 3. Projected Growth of the Indian Smart Home Market (2023–2026). Adapted from Global Market Estimates (2023)

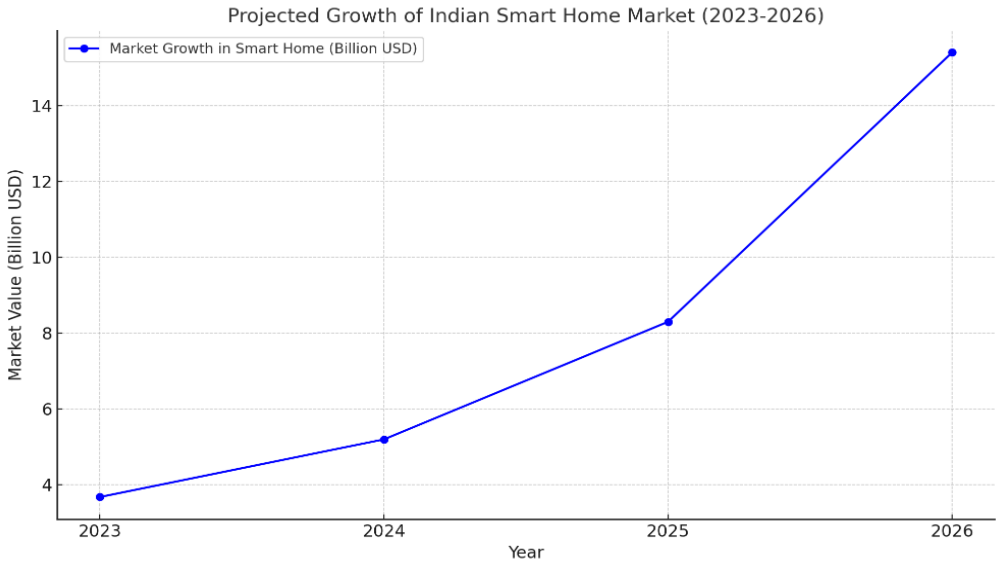

Figure 3. Projected Growth of the Indian Smart Home Market (2023–2026). Adapted from Global Market Estimates (2023)

The Indian smart home market is expected to grow exponentially—from USD 3.68 billion in 2023 to an estimated USD 15.4 billion by 2026. This trend underscores a robust increase in both consumer demand and technological supply, reflecting a deeper digital penetration and smart lifestyle aspirations, especially in Tier 1 and Tier 2 cities (Statista, 2024; KPMG, 2023). The proliferation of connected devices, voice-controlled assistants, and energy-efficient solutions is driving the digital ecosystem of housing forward, aligned with government support and increasing broadband accessibility. The Indian smart home market has exhibited robust growth in recent years, driven by increasing urbanization, consumer demand for energy efficiency, and the integration of PropTech into real estate workflows. As illustrated in Figure 1, the market has grown steadily from ₹4,000 crore in 2020 to an expected ₹36,000 crore by 2026 (Statista, 2024; Markets and Markets, 2023). This trajectory highlights the rising appetite for digital solutions that enhance convenience, security, and personalization in home environments.

Challenges and Adoption Barriers

Despite impressive growth, the adoption of Prop-Tech and smart home technologies in India faces several systemic challenges. High initial costs deter many consumers, especially in non-metro areas. Although prices for individual devices have reduced, comprehensive home automation remains expensive and is seen as a luxury rather than a necessity. Interoperability is another concern, as smart devices from different brands often lack compatibility, leading to fragmented user experiences.

Privacy and data security emerge as critical issues, especially in smart home ecosystems where devices continuously collect and transmit user data. Consumers are increasingly cautious about how data is stored, shared, and protected. The absence of robust data protection laws tailored to IoT and smart home technologies exacerbates this concern. Moreover, limited digital literacy in semi-urban areas often results in underutilization of available features, reducing the perceived value of smart home investments. Consumer awareness is also uneven. While large-scale advertising and influencer marketing campaigns have increased product visibility in metros, many potential users in Tier 2 and 3 cities remain unaware of the benefits and applications of PropTech and smart home solutions. This gap indicates the need for localized outreach, vernacular content, and experiential marketing. There is limited longitudinal research capturing consumer adoption over time. Additionally, behavioral insights from rural and lower-income urban segments are underrepresented. Future studies should explore gendered adoption patterns, post-purchase satisfaction with smart systems, and the impact of tech on real estate investment behavior.

CONCLUSION

The literature reveals a dynamic interplay between technological innovation and consumer behavior in India's evolving real estate landscape. The widespread adoption of PropTech in Tier 1 cities highlights a strong correlation between digital infrastructure, income levels, and behavioral readiness for technology. AI-enabled property platforms and VR-powered walkthroughs have become essential tools in the property search process, reflecting the increasing trust consumers place in digital interfaces. However, the disparity in adoption across city tiers underscores the influence of economic and social factors on behavioral intent. While models such as TAM, DOI, and TPB effectively explain urban digital adoption, they also expose barriers in Tier 2 and Tier 3 regions, where affordability, awareness, and perceived control are limiting factors.

The rapid expansion of smart home devices in metro cities contrasts with modular and utility-driven use cases in smaller towns, suggesting a phased adoption curve driven by income elasticity and perceived value. Additionally, the regulatory environment and government-backed initiatives like Smart Cities Mission are acting as enablers, but consumer education and interoperability standards remain critical for widespread acceptance. Overall, India's PropTech growth reflects both promise and polarization—requiring a balance between innovation, affordability, and accessibility to achieve inclusive digital transformation in real estate.

The real estate sector in India is at a transformative crossroads, propelled by digital technologies that are redefining consumer experiences and expectations. Smart homes and PropTech are no longer futuristic concepts but tangible elements of urban housing in India's leading cities. However, the adoption landscape is fragmented and inequitable, highlighting the need for strategic interventions. This paper demonstrates that consumer behavior toward smart-home and PropTech technologies in India is shaped by a complex interplay of perceived benefits, socio-cultural norms, infrastructural limitations, and policy frameworks. While digital innovations offer measurable benefits—such as transaction transparency, energy efficiency, and process efficiency—adoption remains hindered by cost, awareness, and trust-related barriers.

To build a truly inclusive PropTech ecosystem, industry players must focus on user-centric designs, multilingual onboarding, modular affordability, and strong after-sales networks. Policymakers, on the other hand, should extend regulatory clarity and incentives for both developers and consumers, especially in non-metro areas. Public-private partnerships could be a key enabler in ensuring equitable access to smart housing.

Future research should adopt longitudinal, mixed-method approaches to track evolving consumer behavior and validate usage data. There is also a need to understand post-adoption challenges, such as device maintenance, security breaches, and the psychological impact of automated environments. By integrating technological innovation with behavioral understanding, India can leapfrog into a digitally empowered real estate future that is sustainable, scalable, and socially inclusive.

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