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# Understanding the Digital Home-Service User: A Conceptual Model for Ludhiana's Consumers

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**Abstract:**
The rapid growth of digital home-service platforms has transformed how urban consumers access essential services such as cleaning, repairs, beauty, and maintenance. This paper develops a conceptual model to understand the digital home-service user in Ludhiana, a fast-growing urban and industrial city in India. Drawing from consumer behaviour, technology acceptance, and service marketing literature, the model integrates key determinants including perceived usefulness, ease of use, trust, service quality, pricing transparency, digital literacy, and socio-demographic characteristics. The framework also incorporates contextual factors such as urban lifestyle pressures, platform reliability, and local service availability, which shape adoption and continued usage intentions. By focusing on Ludhiana's consumers, the study captures the dynamics of digital service consumption in tier-II Indian cities, where traditional service arrangements coexist with platform-based models. The proposed conceptual model offers a structured foundation for future empirical research and provides insights for digital home-service platforms, policymakers, and service providers to design user-centric strategies, improve adoption, and enhance service delivery in similar urban contexts.

**Keywords:** Digital home-service platforms, Consumer Behaviour, Technology Acceptance, and Service Marketing.

## 1. Introduction

The concept of the digital home has evolved substantially over the past two decades, moving from technology-centric infrastructure models to consumer-oriented service ecosystems. Early research on digital home environments primarily focused on technical architectures such as integrated home networks, home servers, and service delivery platforms (Saqib, & Shah, 2023; Saqib, & Satar, 2021 designed to enable seamless connectivity among devices and services (Tsai et al., 2000; Bae et al., 2003). These foundational studies emphasized system interoperability, network performance, and service management as core requirements for digital home services. Subsequent developments expanded this perspective by examining platform performance, scalability, and quality of service, highlighting the importance of efficient service delivery and management systems in sustaining digital home environments (Lee et al., 2006a; Lee et al., 2006b; Chazalet et al., 2011).

As digital home services matured, scholarly attention gradually shifted from purely technical considerations to issues of user acceptance and consumer behaviour. Studies examining customer acceptance revealed that technological sophistication alone does not ensure adoption; instead, perceived usefulness, ease of use, service reliability, and alignment with user needs play a decisive role in shaping acceptance of digital home services (Eom & Paek, 2006; Noh & Kim, 2010). These insights aligned with broader technology acceptance frameworks and underscored the necessity of understanding users as active decision-makers rather than passive recipients of digital innovations. Policy and governance dimensions also gained relevance, particularly in contexts involving multiple service providers and integrated

platforms, where coordination, trust, and regulatory alignment influence service continuity and user confidence (Brennan et al., 2009).

More recent literature situates digital home services within the expanding smart home and on-demand service economy. Research demonstrates that consumers increasingly combine heterogeneous digital products and services to create personalized service networks that fit their daily routines and lifestyle preferences (Harvey et al., 2020). Mobile applications and platform-based models have further accelerated this shift, enabling on-demand access to home services such as cleaning, repairs, maintenance, and personal care (Abd Aziz & Yahya, 2023). Contemporary system-planning studies also highlight the need for user-centric design approaches that integrate technological feasibility with consumer expectations, affordability, and ease of interaction (Mamat & Azizan, 2024).

Despite the growing body of international research, limited attention has been paid to understanding digital home-service users in the context of Indian tier-II cities. Cities such as Ludhiana present a distinct consumption environment characterised by rapid urbanisation, rising smartphone penetration, changing household structures, and the coexistence of traditional service arrangements with app-based platforms. Consumer trust, digital literacy, pricing sensitivity, and service quality expectations may differ substantially from those observed in metropolitan or highly digitised settings. These contextual factors necessitate a focused examination of how users in such cities perceive, adopt, and continue to use digital home services.

Against this backdrop, the present study proposes a conceptual model to understand the digital home-service user in Ludhiana. Building on prior research in digital home systems, user acceptance, and smart service ecosystems, the model integrates technological, behavioural, and contextual determinants of adoption and usage. By grounding the framework in established literature while addressing a specific urban Indian context, this study aims to contribute to the digital home-service literature and provide a foundation for future empirical investigations and platform-level strategic interventions.

## 2. Literature Review

Research on digital home services has progressed from a strong emphasis on technological infrastructure to a broader, user-centric understanding that integrates consumer behaviour, platform ecosystems, and service value creation. Early studies laid the technological foundation for digital home environments by focusing on integrated networks, system architectures, and service gateways. Tsai et al. (2000) introduced the concept of an integrated home service network based on intelligent intranet systems, highlighting the role of seamless connectivity in enabling multiple home services. Building on this, Bae et al. (2003) proposed the use of home servers as central control units for managing digital home service environments, stressing reliability, scalability, and interoperability as critical technical requirements. Similar system-oriented perspectives were advanced by Lee et al. (2006a; 2006b), who examined platform design, service delivery mechanisms, and performance evaluation of digital home service management systems, reinforcing the importance of robust infrastructure for sustained service provision.

As digital home technologies evolved, scholars began addressing service integration and governance challenges. Brennan et al. (2009) examined policy-based integration of multi-provider digital home services, arguing that coordination among service providers and clear policy frameworks are essential to ensure continuity, security, and user trust. Complementing this work, Lozano et al. (2008) proposed autonomic provisioning models that allow digital home services to self-manage and adapt dynamically, thereby improving service efficiency and user experience. Quality of service (QoS) also emerged as a critical concern, with Chazalet et al. (2011) emphasising performance reliability, latency, and service responsiveness as determinants of perceived service quality in digital home environments.

Parallel to these technical developments, a significant stream of literature examined user acceptance and adoption of digital home services. Eom and Paek (2006) demonstrated that customer acceptance should be a central input in planning digital home services, as user expectations, perceived benefits, and lifestyle compatibility strongly influence adoption decisions. Noh and Kim (2010) further identified perceived usefulness, ease of use, perceived risk, and cost considerations as key factors shaping user acceptance,

situating digital home services within established technology acceptance models. Studies from emerging economies, such as Ramantoko et al. (2016), confirmed that early adopters of home digital services tend to exhibit higher technological readiness, stronger innovation orientation, and favourable attitudes towards digital solutions, although contextual factors remain influential.

The expansion of mobile technologies and platform-based service models shifted attention toward on-demand home services and digital households. Abd Aziz and Yahya (2023) highlighted how mobile applications facilitate real-time access to home services, transforming traditional service arrangements into flexible, app-mediated interactions. Mamat and Azizan (2024) reinforced this perspective by examining the planning process of the "HOMERESC" home service system, emphasising user-centred design, process integration, and operational feasibility. These studies suggest that effective digital home-service platforms must balance technical robustness with usability, transparency, and service responsiveness.

Recent literature has increasingly framed digital home services within smart home ecosystems and service networks. Harvey et al. (2020) demonstrated that consumers actively combine heterogeneous smart products and services to construct personalised service networks, positioning users as co-creators of value rather than passive recipients. Mao and Chang (2023) extended this view by reviewing cross-device interaction in smart homes, highlighting the importance of seamless user experiences across multiple devices. Research on automation levels further indicates that excessive or insufficient automation can negatively affect adoption, suggesting that optimal control and flexibility are critical for user satisfaction (Yang et al., 2018).

Studies focusing on advanced applications such as service robots and embedded care platforms provide additional insights into perceived value and household heterogeneity. You et al. (2003) and Kim (2025) explored home service robots, showing that perceived usefulness varies across households depending on demographics, needs, and daily routines. Lim and Song (2025) demonstrated that perceived value mediates the relationship between smart home technologies and user satisfaction among vulnerable populations, underlining the social dimension of digital home services. In health and care contexts, Chen et al. (2017), Støme et al. (2020), and Lima (2025) highlighted how digital home platforms can complement or substitute traditional care services, influencing decision-making, outcomes, and service satisfaction.

Barriers and resistance to adoption form another important strand of the literature. Nascimento et al. (2023) identified perceived complexity, privacy concerns, and cost as major barriers to smart home service implementation, while Kumar et al. (2022) applied innovation resistance theory to home service applications, showing that cultural and country-specific contexts moderate resistance behaviour. Privacy and security concerns, particularly in data-intensive smart home environments, were examined by Nagarkar (2022), who emphasised the need for dynamic risk assessment mechanisms to build user trust.

From an Indian context, research on smart cities and digital transformation provides relevant background. Praharaj (2019) discussed the challenges and opportunities of India's smart city initiatives, pointing to uneven adoption and contextual disparities across cities. Sharma et al. (2024) analysed customer intention to use smart home services in India, confirming the roles of perceived usefulness, trust, and affordability. Sectoral disruptions caused by digital platforms, such as those observed during the COVID-19 pandemic in service industries, further underline shifting consumer expectations and reliance on digital intermediaries (John & Gopalakrishnan, 2022).

Overall, existing literature demonstrates that digital home services are shaped by the interaction of technological infrastructure, platform governance, user perceptions, and contextual factors. While global studies provide valuable insights into system design, acceptance, and service ecosystems, there remains limited research focusing on user behaviour in Indian tier-II cities. This gap is particularly relevant for understanding cities like Ludhiana, where digital home-service platforms operate alongside traditional service arrangements. The present study addresses this gap by synthesising prior technological and behavioural research to develop a conceptual model tailored to the digital home-service user in a tier-II Indian urban context.

## 3. Methodology

This study follows a conceptual research methodology aimed at developing a theoretically grounded framework to explain digital home-service user behaviour in Ludhiana. Rather than relying on primary data collection, the methodology focuses on systematic synthesis and integration of existing theories and empirical findings from digital home services, smart home technologies, consumer behaviour, and platform-based service literature. A qualitative, theory-building research design is adopted. The approach is suitable for conceptual studies that seek to clarify constructs, identify key relationships, and propose an explanatory model. The study draws on established theoretical foundations such as the Technology Acceptance Model, service quality theory, trust and risk frameworks, and platform ecosystem perspectives to guide model development.

The conceptual framework is developed through an extensive review of peer-reviewed journal articles, conference proceedings, and scholarly books indexed in Scopus and Web of Science. Priority is given to highly cited and recent studies on digital home services, smart homes, on-demand service platforms, and consumer adoption behaviour. Both global and India-focused studies are included to ensure contextual relevance. Key constructs influencing digital home-service usage are identified through thematic analysis of the literature. Recurrent factors such as perceived usefulness, ease of use, trust, service quality, pricing transparency, perceived risk, digital literacy, and socio-demographic characteristics are extracted and defined based on prior empirical evidence. Context-specific variables relevant to tier-II cities, including urban lifestyle pressures, availability of local service providers, and cultural preferences, are also incorporated. The conceptual model is developed by logically linking the identified constructs based on established theoretical relationships reported in prior studies. Determinants of adoption are positioned as antecedents influencing users' intention to use digital home services, which in turn affects satisfaction and continued usage intention. Moderating and contextual factors are introduced to capture variations in consumer behaviour within the Ludhiana context.

## 4. Conceptual Model

The conceptual model explains the mechanism through which consumers in Ludhiana adopt, evaluate, and continue using digital home-service platforms. The model integrates technology acceptance theory, service quality perspectives, and platform-based service ecosystem logic, while embedding contextual realities specific to tier-II Indian cities.

At the foundational level, **t**echnological perceptions act as primary antecedents. *Perceived usefulness* reflects the extent to which users believe that digital home-service platforms enhance convenience, save time, and improve access to reliable services. *Perceived ease of use* captures the simplicity of learning, navigating, and transacting on these platforms. Together, these perceptions directly influence **a**doption intention, determining whether consumers are willing to initiate platform usage.

**Service-related factors** strengthen post-adoption evaluations and behavioural continuity. *Service quality*, reflected through reliability, timeliness, professionalism, and outcome consistency, shapes users' experiential assessment of platform performance. *Pricing transparency*, including clarity of charges, absence of hidden costs, and value-for-money perceptions, reduces uncertainty and enhances confidence. These factors exert a positive influence on user satisfaction, which subsequently drives continued engagement.

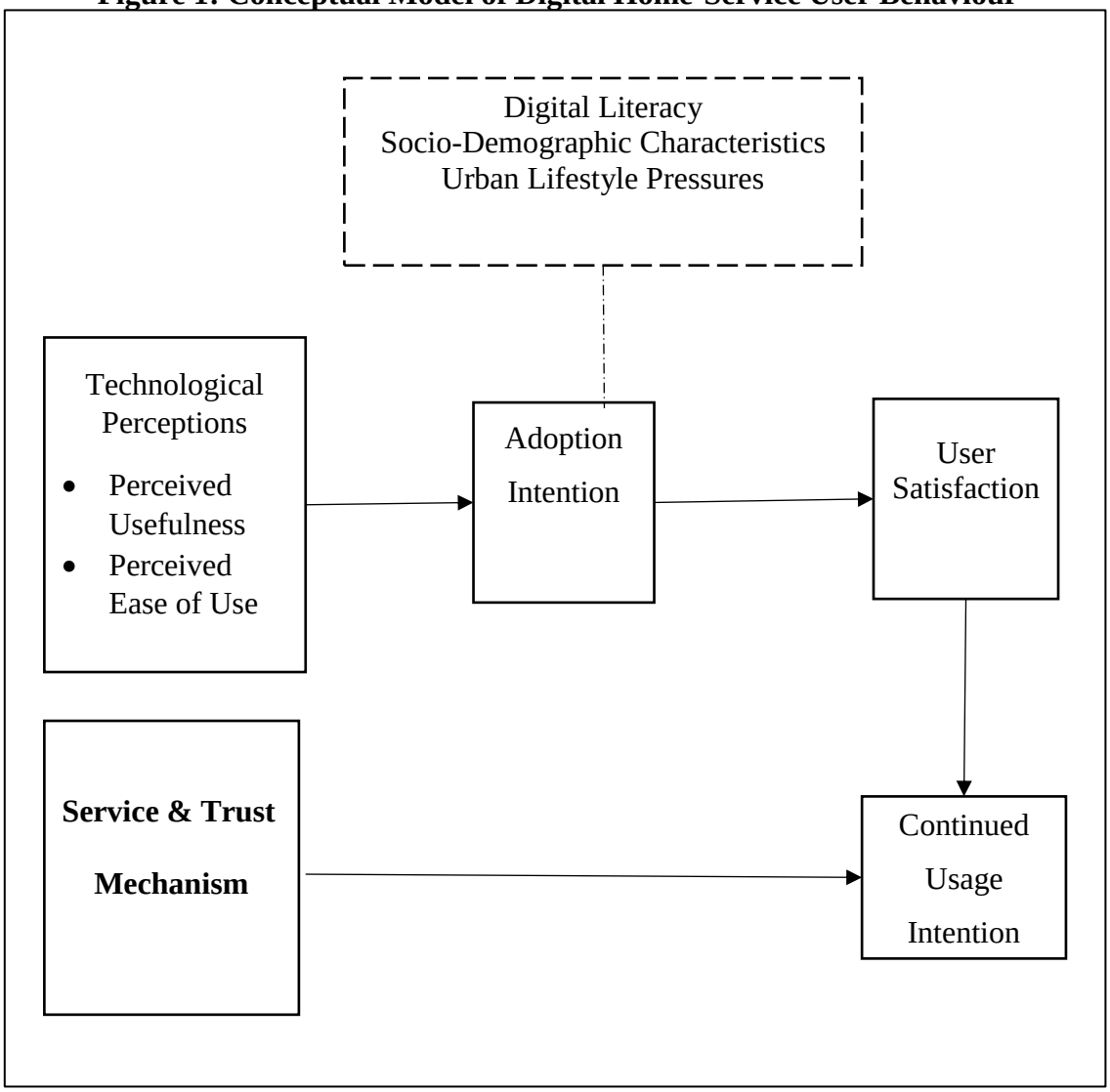
**Trust and perceived risk** occupy a central mediating position within the model. Trust develops through confidence in platform security and data protection, credibility of service providers, and fairness of grievance redressal mechanisms. In contrast, perceived risk related to privacy, safety, payment security, and service uncertainty acts as a restraining force that can weaken adoption intention and satisfaction if not effectively mitigated. Trust is therefore positioned as a critical link between platform attributes and behavioural outcomes.

**User capability and contextual factors** moderate key relationships in the model. *Digital literacy* affects users' ability to search for services, compare options, complete transactions, and manage post-service

interactions. *Socio-demographic characteristics* such as age, education, income, and household structure explain heterogeneity in adoption and usage intensity. Additionally, *urban lifestyle pressures* including time scarcity, dual-income households, and evolving family structures create situational motivation for relying on digital home services rather than traditional service arrangements.

The model culminates in three behavioural outcomes. *Adoption intention* represents the likelihood of initial platform use. *User satisfaction* captures the overall evaluation of service experience following usage. *Continued usage intention* reflects the willingness to reuse the platform and recommend it to others, indicating long-term platform sustainability.

**Figure 1: Conceptual Model of Digital Home-Service User Behaviour**




Source: Authors own Work

## 5. Discussion

The conceptual model proposed in this study provides a structured explanation of digital home-service user behaviour in the context of Ludhiana, a representative tier-II Indian city. By integrating technological perceptions, service-related attributes, trust mechanisms, and contextual factors, the model responds to gaps identified in prior digital home and smart service literature that has largely focused on technologically advanced or metropolitan settings. The discussion interprets the relevance of each component of the model in light of existing research and the specific urban characteristics of Ludhiana.

First, the central role of perceived usefulness and ease of use reinforces earlier findings that functional value and simplicity remain fundamental drivers of digital service adoption (Noh & Kim, 2010; Eom & Paek, 2006). In the Ludhiana context, usefulness is closely associated with time savings, convenience, and

access to reliable service providers, particularly for working households and nuclear families. Ease of use becomes critical due to varying levels of digital literacy among users, suggesting that platform complexity can act as a silent barrier to adoption even when services are perceived as beneficial.

Second, service quality and pricing transparency emerge as decisive factors shaping satisfaction and continued usage. Consistent with service management and QoS literature (Chazalet et al., 2011; Lee et al., 2006), reliability, professionalism, and predictable outcomes strengthen user confidence. In tier-II cities, where informal service markets are still prevalent, transparent pricing and standardised service processes offer a clear advantage over traditional arrangements. This highlights the importance of operational discipline and local service partner management for platform sustainability.

The inclusion of trust and perceived risk reflects growing concerns around safety, privacy, and service accountability in digital home environments. Prior studies on platform integration and governance emphasise that trust is not merely a technological issue but a relational one involving platform policies, service provider behaviour, and grievance redressal mechanisms (Brennan et al., 2009). In Ludhiana, trust plays a mediating role between platform features and user behaviour, particularly for services that involve physical access to homes. Failure to address trust-related concerns may limit adoption beyond early users.

The model also highlights the significance of digital literacy and socio-demographic characteristics as moderating influences. This aligns with evidence from emerging economy studies showing that age, education, income, and prior technology exposure shape adoption trajectories (Ramantoko et al., 2016; Kumar et al., 2022). In Ludhiana, these factors explain why digital home-service adoption may be uneven across neighbourhoods and population segments. Digital literacy enhances users' ability to evaluate service options, manage risks, and derive value from platforms, while limited literacy may reinforce dependence on traditional service providers.

Contextual variables such as urban lifestyle pressures and changing household structures provide an important backdrop to behavioural outcomes. Similar to observations in smart home and service ecosystem research (Harvey et al., 2020), users are not passive adopters but active organisers of their service networks. In Ludhiana, the coexistence of traditional and digital service options allows consumers to selectively adopt platforms based on urgency, complexity, and trust, rather than full substitution. This hybrid usage pattern differentiates tier-II cities from metropolitan contexts where platform dependence is often higher.

From a theoretical standpoint, the model extends existing digital home-service frameworks by incorporating service quality and contextual dimensions alongside traditional technology acceptance constructs. It also aligns with user-centric and ecosystem-based perspectives by recognising the dynamic interaction between users, platforms, and local service providers. Practically, the discussion suggests that digital home-service platforms operating in tier-II cities must move beyond app functionality to focus on trust-building, service standardisation, and user education.

Overall, the discussion underscores that digital home-service adoption in Ludhiana is shaped by a combination of perceived value, service experience, trust, and contextual realities. The proposed model offers a coherent lens for understanding these interactions and sets the stage for future empirical research that can test and refine the relationships within similar urban environments.

## 6. Conclusion

This study develops a comprehensive conceptual model to explain digital home-service user behaviour in Ludhiana, addressing an important gap in existing digital home and smart service literature. By integrating technological perceptions, service-related attributes, trust mechanisms, and contextual factors, the model reflects the complex realities of digital service adoption in a tier-II Indian city where traditional and platform-based service systems coexist.

The framework highlights that perceived usefulness and ease of use remain fundamental drivers of adoption, but they are insufficient on their own to ensure sustained engagement. Service quality, pricing transparency, and trust emerge as equally critical in shaping user satisfaction and continued usage intention, particularly in contexts where safety, reliability, and accountability are major consumer

concerns. The inclusion of digital literacy and socio-demographic characteristics further explains heterogeneity in adoption patterns, emphasising that digital home-service usage is not uniform across population segments.

By situating the analysis within Ludhiana, the study extends digital home-service research beyond metropolitan and technologically advanced settings. The conceptual model offers theoretical value by combining technology acceptance and service ecosystem perspectives with context-specific variables relevant to emerging urban markets. It also provides practical guidance for digital home-service platforms, suggesting that long-term success depends on user-centric design, trust-building strategies, and alignment with local service expectations.

Overall, this study lays a structured foundation for future empirical research aimed at testing and refining the proposed relationships. It also contributes to a deeper understanding of how digital home services can be effectively designed and deployed in tier-II cities, supporting inclusive and sustainable digital service ecosystems.

## 7. Implications

The conceptual model proposed in this study offers several important implications for theory, practice, and policy in the context of digital home services, particularly within tier-II cities such as Ludhiana.

**Theoretical Implications:** From a theoretical perspective, this study extends existing digital home and technology acceptance literature by integrating service quality, trust, and contextual variables into a unified framework. While prior models have largely focused on technological determinants of adoption, the present framework highlights the importance of service experience and local context in shaping user behaviour. By incorporating digital literacy and urban lifestyle factors, the model advances understanding of heterogeneous adoption patterns in emerging urban markets. It also contributes to service ecosystem theory by positioning users as active participants who evaluate and combine digital and traditional service options based on perceived value and trust.

**Managerial Implications:** For digital home-service platform providers, the findings emphasise that technological functionality alone is insufficient to drive sustained usage. Platform managers should prioritise intuitive interface design, transparent pricing structures, and consistent service quality to enhance perceived usefulness and ease of use. Building trust through verified service providers, clear safety protocols, secure payment systems, and effective grievance redressal mechanisms is particularly critical in services involving home access. Additionally, platforms operating in tier-II cities should invest in user education initiatives and localized onboarding strategies to address variations in digital literacy and to expand adoption beyond early users.

**Service Provider Implications**: Local service professionals associated with digital platforms must be viewed as integral contributors to the user experience. Training, performance monitoring, and standardisation of service delivery can significantly influence customer satisfaction and platform reputation. The model suggests that reliable and professional service behaviour can strengthen trust and encourage repeat usage, supporting more stable income opportunities for service providers within the digital ecosystem.

**Policy Implications**: For policymakers and urban planners, the study highlights the role of digital home services in supporting changing urban lifestyles and employment patterns. Policies promoting digital literacy, consumer protection, and data privacy can enhance user confidence and facilitate wider adoption of platform-based services. In tier-II cities, supportive regulatory frameworks and public awareness initiatives can help integrate digital home services into broader smart city and digital inclusion agendas.

## 8. Limitations and Future Research Directions

This study is conceptual in nature and does not involve empirical data collection or statistical validation of the proposed relationships. As a result, the strength and direction of associations among the constructs remain theoretically inferred rather than empirically tested. The conceptual model is developed specifically for Ludhiana, a tier-II Indian city, which may limit the generalisability of the framework to

metropolitan cities or rural contexts with different socio-economic and digital maturity levels. Additionally, the model focuses primarily on consumer perspectives and does not explicitly incorporate platform-side or service-provider-side operational constraints, which may also influence service quality and user satisfaction. Rapid technological changes and evolving platform features further imply that user perceptions and adoption drivers may shift over time, which a static conceptual framework may not fully capture. Future studies should empirically test the proposed conceptual model using quantitative or mixed-method research designs to validate the relationships among technological perceptions, service quality, trust, and behavioural outcomes. Comparative studies across tier-I, tier-II, and tier-III cities in India would provide deeper insights into contextual variations in digital home-service adoption. Longitudinal research could examine how user perceptions, trust, and usage intentions evolve with prolonged platform exposure and repeated service experiences. Further research may also integrate service-provider and platform governance perspectives to capture a more holistic view of the digital home-service ecosystem. In addition, future studies could explore the role of emerging technologies such as artificial intelligence, automation, and service robots in shaping user expectations and value perceptions within digital home services.

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