

# FROM INTENTION TO ADOPTION: THE ROLES OF HABIT FORMATION, SERVICE QUALITY, AND REGULATORY CONTEXT IN MOBILE PUBLIC SERVICES

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## Abstract

The rapid expansion of mobile-based public services has increased the need to understand the drivers of sustained digital service adoption. While technology adoption research has traditionally emphasized behavioral intention as the primary predictor of use, this perspective provides only a partial explanation of actual usage behavior in digital public services. This study moves beyond intention-based models by examining the roles of habit formation, service quality, and regulatory context in shaping mobile public service adoption. Using survey data from 542 users of a mobile public service application, the study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) to test an integrated framework combining technology adoption constructs, service quality factors, and behavioral mechanisms. The model evaluates the effects of electronic service quality, facilitating conditions, social influence, perceived risk, price perception, promotion, personal innovativeness, hedonic motivation, and habit on adoption behavior, with consumer satisfaction and behavioral intention as mediating variables and digital regulation as a moderating contextual factor. The results show that habit formation is the strongest predictor of both behavioral intention and actual usage. Electronic service quality significantly enhances user satisfaction, while facilitating conditions and social influence influence behavioral intention. Digital regulation strengthens the relationship between intention and actual usage, indicating the importance of supportive institutional environments. These findings extend digital government research by demonstrating that sustained mobile public service adoption depends not only on user intention but also on behavioral reinforcement, service quality, and regulatory alignment.

**Keywords:** Digital Service Adoption, Mobile Public Services, UTAUT Extension, Habit Formation, Electronic Service Quality, Digital Regulation, PLS-SEM

## 1. Introduction

The rapid advancement of information and communication technologies has significantly transformed the way organizations deliver services to consumers across various industries (Safira et al., 2023). As digital technologies continue to evolve, organizations increasingly shift from conventional service systems toward electronic service platforms that enable faster, more efficient, and more interactive customer engagement (Aditya, 2022). In the contemporary digital economy, mobile applications have become an essential

component of business processes, enabling organizations to facilitate transactions, deliver services, and maintain continuous customer interaction.

The growth of internet penetration further reinforces the importance of digital platforms in service delivery. As of January 2024, the number of internet users has reached approximately 185 million, indicating the rapid expansion of digital technology adoption in Indonesia (Rizti, 2024). Historical data also demonstrate substantial growth in digital adoption, with the highest

increase reaching 24.6% in 2018 (Rizti, 2024). The widespread availability of internet access creates significant opportunities for organizations to expand market reach through integrated digital platforms and mobile-based services. Mobile technology plays a particularly critical role in facilitating digital interaction. Approximately 98.8% of internet users access online services through smartphones, making mobile applications the primary medium for digital engagement (Rizti, 2024). Internet users also spend an average of 7 hours and 38 minutes online each day, with a large proportion of this time dedicated to social media platforms (Slice.id, 2024). Platforms such as YouTube, TikTok, Facebook, and Instagram have become dominant channels through which consumers discover products, obtain information, and interact with brands and organizations (Slice.id, 2024). Search engines also remain a major source of information, with Google accounting for more than 95% of search activities (Slice.id, 2024). These trends highlight the growing importance of digital platforms as primary channels for communication, service delivery, and marketing activities.

In this environment, digital marketing has emerged as a key strategy for organizations seeking to engage consumers within the digital ecosystem. Digital marketing refers to marketing activities that utilize internet-based technologies and digital platforms to promote products or services to targeted audiences (Pangestika, 2024). Unlike traditional marketing approaches that rely on conventional media channels, digital marketing enables organizations to reach broader audiences, deliver personalized communication, and obtain measurable insights regarding customer behavior. Through effective digital marketing strategies, organizations can enhance customer interactions, improve service delivery, and develop data-driven marketing decisions.

In addition to marketing strategies, the quality of electronic services plays a critical role in shaping customer perceptions and satisfaction in digital environments. High electronic service quality contributes to the effectiveness and attractiveness of online services, ultimately leading to higher levels of customer satisfaction and stronger engagement with digital platforms (Rahmatika & Madiawati, 2020). Consequently, improving digital service platforms has become a strategic priority for many organizations seeking to strengthen their competitive advantage and enhance customer experience.

As part of broader digital transformation initiatives, many organizations have introduced mobile-based service platforms designed to provide integrated

digital services. These platforms enable customers to access information, conduct transactions, submit complaints, and interact with service providers in real time through mobile applications. The implementation of such platforms is expected to enhance service accessibility, improve operational efficiency, and reduce service costs while simultaneously improving customer satisfaction. Despite these potential benefits, the success of digital service platforms depends not only on technological availability but also on the extent to which users adopt and actively utilize these applications. A frequently observed phenomenon in digital service ecosystems is the gap between the number of application downloads and the number of active users who regularly use the platform. While many users install mobile applications, only a portion of them actively engage with the platform to perform transactions or access services. This discrepancy raises important questions regarding the factors that influence user adoption, continued usage, and engagement with digital service platforms.

In the field of information systems research, technology adoption behavior has been widely examined using the Unified Theory of Acceptance and Use of Technology (UTAUT). The UTAUT model is considered one of the most comprehensive frameworks for explaining user acceptance of information technology (Malik, 2020). The extended version, UTAUT2, has received extensive attention in information systems research and has been cited widely due to its strong explanatory power in predicting technology adoption behavior (Taherdoost, 2018; Tamilmani et al., 2021). Further developments in the framework led to the introduction of UTAUT3, which integrates additional contextual and behavioral variables to better explain technology adoption in evolving digital environments (Farooq et al., 2018). However, despite the extensive literature on technology adoption and digital service use, several important gaps remain. First, most prior studies examining digital service adoption primarily focus on technological determinants such as performance expectancy, effort expectancy, and facilitating conditions, while relatively little attention has been given to integrating marketing-related variables, such as promotion, price perception, and electronic service quality, within the technology acceptance framework. Second, although UTAUT-based models have been widely used to explain technology adoption behavior, previous studies rarely incorporate consumer satisfaction as a mediating mechanism linking technological and marketing factors to actual usage behavior. Third, existing studies tend to emphasize

behavioral intention as the primary outcome variable, while the transition from intention to actual usage behavior remains underexplored, particularly in the context of mobile service platforms. Furthermore, the moderating role of digital regulation in shaping digital service usage behavior has received limited empirical attention, despite its increasing importance in contemporary digital ecosystems. Finally, empirical studies integrating perspectives on technology adoption, marketing strategy, and consumer behavior in the context of mobile-based public service platforms remain relatively scarce.

To address these gaps, this study develops an integrated framework that combines technology adoption theory, marketing perspectives, and consumer behavior constructs to explain digital service usage in mobile service platforms. Specifically, this study examines the influence of electronic service quality, facilitating conditions, price perception, promotion, social influence, perceived risk, personal innovativeness, hedonic motivation, and habit on digital service usage. Consumer satisfaction and behavioral intention are incorporated as mediating variables, while digital regulation is introduced as moderating variable influencing the relationship between satisfaction, intention, and actual usage behavior. By integrating these perspectives, this study aims to provide a more comprehensive understanding of the determinants of digital service use, contribute to the literature on digital service adoption, and offer practical insights for organizations seeking to enhance user engagement on digital service platforms.

## 2. Literature Review

### 2.1 Marketing and Digital Marketing

Marketing refers to the process of identifying and satisfying human and social needs in a profitable way (Kotler & Keller, 2016). It is concerned with creating, delivering, and communicating value to attract, retain, and grow customers (Kotler & Keller, 2016; Rizal, 2020). A core concept in marketing is the marketing mix, commonly known as the 4Ps: product, price, place, and promotion (McCarthy, 1964; Rizal, 2020). These elements remain relevant in digital environments, where customer value is shaped not only by the offering itself but also by service accessibility, transaction flexibility, and communication quality.

Digital marketing expands traditional marketing into online and technology-driven channels. It leverages internet-based platforms, mobile devices, search engines, social media, and other digital tools to promote products and services and engage with users more effectively. argues that digital

marketing is not primarily about technology, but about people and how technology is used to build relationships with them. In this way, digital marketing functions both as a communication strategy and a service-delivery mechanism. Its success depends on customer characteristics, organizational capabilities, and the ability of firms to adapt to technological changes. adapt to technological change (Indrasari et al., 2024; Ryan, 2014).

### 2.2 Consumer Behavior

Consumer behavior concerns how individuals make decisions, interpret experiences, and respond to environmental and marketing stimuli (Ahsan, 2022; Mowen, 2000). In digital contexts, user behavior is shaped not only by rational evaluation but also by social influence, prior experience, and habitual use. This makes consumer behavior theory particularly relevant for understanding adoption and continued use of a mobile service platform.

### 2.3 Service Quality

Service quality (SERVQUAL) is a key determinant of customer evaluation and organizational competitiveness (Tjiptono, 2017). The SERVQUAL perspective conceptualizes service quality as the gap between customer expectations and actual service performance (Oktavia, 2016; Parasuraman et al., 2017). In digital settings, this concept evolves into electronic service quality, which reflects how efficiently, reliably, and conveniently a digital platform delivers services. High electronic service quality contributes to better customer experience and higher satisfaction (Rahmatika & Madiawati, 2020).

### 2.4 Customer Satisfaction

Customer satisfaction refers to a customer's overall evaluation of whether a service or product meets expectations (Hanaysha, 2017; Syam et al., 2024). Satisfied users are more likely to continue using a service over time, although satisfaction alone may not always translate into repeated behavior. In digital service environments, satisfaction often serves as both an outcome of service quality and a mechanism shaping continued usage.

### 2.5 Unified Theory of Acceptance and Use of Technology

Technology adoption has been widely explained using the Unified Theory of Acceptance and Use of Technology (UTAUT), which integrates several earlier theories, including Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB),

and Technology Acceptance Model (TAM) (Samar & Mazuri, 2019; Venkatesh et al., 2003). UTAUT has been shown to explain a substantial proportion of variance in behavioral intention to use new technologies (Ramírez-Correa et al., 2019), making it one of the most influential models in technology adoption research.

UTAUT 2 extends the original model to consumer contexts by incorporating additional constructs such as price value, hedonic motivation, and habit (Dzulhaida & Giri, 2017; Venkatesh et al., 2012). This makes the model more suitable for analyzing adoption behavior in mobile, e-commerce, and service-application settings. UTAUT 3 further extends the framework by including personal innovativeness in information technology, thereby broadening its ability to explain technology acceptance in more dynamic digital context (Gunasinghe et al., 2020). Taken together, UTAUT-based models provide a strong theoretical basis for analyzing how technological, behavioral, and individual factors shape the adoption and use of digital service platforms.

#### 2.6 Digital Regulation

Digital regulation refers to the set of legal and policy mechanisms governing digital systems, electronic transaction, personal data protection, platform accountability, and system security (Ahsan, 2024). With the rapid growth of digital services, regulation has become increasingly important in ensuring legal certainty, protecting users, and building trust in digital ecosystems (Alviana & Afrita, 2023).

In digital service contexts, regulation can function as a contextual condition that influences how users perceive safety, legitimacy, and transaction reliability. On the one hand, stronger regulation may increase trust and support the conversion of satisfaction into usage behavior. On the other hand, rigid regulatory procedures may introduce friction and weaken the translation of intention into actual use. Therefore, digital regulation is conceptually relevant as a moderating variable in digital adoption research.

#### 2.7 Digital Public Service Platforms

Digital public service platforms are mobile- or internet-based systems that enable users to access information, conduct transactions, submit requests, and interact with service providers digitally. These platforms are often designed as integrated ecosystems that combine customer-facing services with operational and managerial systems. Their main objectives are to improve customer experience, enhance operational efficiency, and expand access to services through digital channels.

However, the availability of digital platforms does not automatically ensure active use. Their success depends on how users perceive service quality, convenience, value, trust, and relevance to their needs. For this reason, digital public service platforms create an appropriate context for examining the combined influence of marketing, technology adoption, consumer behavior, and regulatory conditions on actual digital service usage.

### 3. Hypotheses Development and Research Model

#### 3.1 Hypotheses Development

This study develops an integrated framework to explain digital service usage by combining perspectives from marketing, consumer behavior, and UTAUT. The model proposes that usage behavior is shaped not only by technology acceptance factors, but also by marketing-related variables, customer evaluation, habit formation, and regulatory context.

#### **Electronic service quality, price, promotion, and customer satisfaction**

Electronic service quality is widely recognized as a key determinant of customer satisfaction in digital environments. Prior studies have shown that better electronic service quality leads to higher customer satisfaction because users value efficiency, reliability, responsiveness, and ease of access in online services (Fadillah, 2017; Rahmatika & Madiawati, 2020). In mobile public service settings, service quality is especially important because users expect reliable transactions, accessible information, and seamless digital interaction. Accordingly, the following hypothesis is proposed: *Hypothesis 1. Electronic service quality positively and significantly affects customer satisfaction.*

Price is another factor that may shape customer evaluations. Earlier studies found that favorable price perceptions positively influence customer satisfaction, as customers tend to compare the value received with the costs incurred (Gofur, 2019; Prasilowati et al., 2021; Syahidin & Adnan, 2022). In digital service contexts, price may also reflect perceived fairness, payment flexibility, and transaction value. Therefore, the following hypothesis is proposed:

*Hypothesis 2. Price positively and significantly affects customer satisfaction.*

Promotion may also contribute to customer satisfaction by improving awareness, clarifying service benefits, and strengthening perceived value. Previous studies reported a positive and significant relationship between promotion and customer

satisfaction (A. E. Nasution & Syahputra, 2022; Prasilowati et al., 2021; Rahmatika & Madiawati, 2020). On digital platforms, promotion is not limited to discounts; it may also include educational communication, feature introductions, and program visibility. Thus, the following hypothesis is proposed:

*Hypothesis 3. Promotion positively and significantly affects customer satisfaction.*

#### **Determinants of behavioral intention**

Facilitating conditions refer to the extent to which users perceive that the resources and support necessary to use a system are available. Empirical studies consistently show that facilitating conditions positively influence behavioral intention (Arifin et al., 2025; Etuk et al., 2025; Rahman & Uddin, 2025). In mobile service platforms, facilitating conditions may include device compatibility, internet access, payment support, and user literacy. Hence:

*Hypothesis 4. Facilitating conditions positively and significantly affect behavioral intention.*

Price may also influence intention when users evaluate whether the service offers economic value of flexible payment options. Previous studies found that price-related perceptions positively affect behavioral intention (Alalwan et al., 2017a; Jayabaya & Madiawati, 2018). Therefore:

*Hypothesis 5. Price positively and significantly affects behavioral intention.*

Promotion may stimulate intention by increasing awareness and perceived attractiveness of the service. Prior research reported a positive relationship between promotion and behavioral intention (Endriyanto & Indrarini, 2022; Jayabaya & Madiawati, 2018). Accordingly:

*Hypothesis 6. Promotion positively and significantly affects behavioral intention.*

Social influence is a core construct in UTAUT-based research. It reflects the extent to which important others shape an individual's perception that a technology should be used. Prior evidence confirms a positive and significant effect of social influence on behavioral intention (Amalia, 2025; Arifin et al., 2025; Rahman & Uddin, 2025). Thus:

*Hypothesis 7. Social influence positively and significantly affects behavioral intention.*

Perceived risk has often been identified as a barrier to technology adoption. Previous studies found that perceived risk negatively and significantly affects behavioral intention, particularly in digital

transaction settings involving security, economic, and functional concerns (Hongxia et al., 2011; Tai & Ku, 2013). Therefore:

*Hypothesis 8. Perceived risk negatively and significantly affects behavioral intention.*

Personal innovativeness in information technology reflects an individual's willingness to try new technologies. UTAUT3-related studies have shown that personal innovativeness positively affects intention to use digital systems (Farooq et al., 2018b; Mohammadi, 2015). Hence:

*Hypothesis 9. Personal innovativeness positively and significantly affects behavioral intention.*

Hedonic motivation refers to the enjoyment or pleasure derived from using a technology. Prior studies indicate that hedonic motivation positively influences behavioral intention in digital service usage (Alalwan et al., 2017; Farooq et al., 2018). Therefore:

*Hypothesis 10. Hedonic motivation positively and significantly affects behavioral intention.*

Habit represents automaticity and repeats prior behavior, and it has been found to strongly shape intention to continue using a technology (Pinto et al., 2022; Putri & Sari, 2025). Since routine behavior may reinforce future usage tendencies, the following hypothesis is proposed:

*Hypothesis 11. Habit positively and significantly affects behavioral intention.*

#### **Direct determinants of digital service usage**

In addition to influencing behavioral intention, facilitating conditions may also directly influence actual usage. Previous studies have reported a positive and significant relationship between facilitating conditions and usage behavior (Arifin et al., 2025; Pinto et al., 2022). This suggests that users are more likely to engage in actual use when infrastructure and support are available. Thus:

*Hypothesis 12. Facilitating conditions positively and significantly affect the use of digital services.*

Personal innovativeness may also directly shape usage behavior by encouraging experimentation and active engagement with digital systems. Prior studies found that personal innovativeness positively affect actual usage behavior (Farooq et al., 2018a; Mulazid et al., 2024). Therefore:

*Hypothesis 13. Personal innovativeness positively and significantly affects digital service usage.*

Habit has been consistently identified as a strong determinant of actual usage, particularly in routine digital interactions. Prior evidence confirms that

habit positively and significantly influences usage behavior (Pratiwi & Oktarina, 2020; Ramírez-Correa et al., 2019; Safira et al., 2023). Accordingly:

*Hypothesis 14. Habit positively and significantly affects digital service usage.*

#### **The mediating role of behavioral intention**

The mediating role of behavioral intention is grounded in TPB, which posits that behavior is directly preceded by intention, while intention itself is shaped by attitudes, perceived control, and external influences (Mohammadi, 2015). Empirical studies consistently confirm that behavioral intention positively influences actual usage behavior (Amalia, 2025; Arifin et al., 2025; Mohammadi, 2015). In addition, previous studies found that behavioral intention mediates the effects of facilitating conditions, social influence, and habit on digital usage behavior (Arifin et al., 2025; R. P. Nasution et al., 2024). Based on these arguments, the following hypothesis is proposed:

*Hypothesis 15. Behavioral intention mediates the relationships between facilitating conditions, price, promotion, social influence, perceived risk, personal innovativeness, hedonic motivation, habit, and digital service usage.*

#### **The mediating role of customer satisfaction**

The mediating role of customer satisfaction is supported by Expectation Confirmatory Theory (ECT). ECT explains that satisfaction emerges from the comparison between initial expectations and perceived performance after service use (Bhattacharjee, 2001). When perceived performance meets or exceeds expectations, satisfaction increases, and such satisfaction may drive continued usage or loyalty (Lin et al., 2009). Prior studies found that customer satisfaction positively influences usage behavior (Mohammadi, 2015; Shetu, 2025), and that service quality may exert an indirect effect on usage through customer satisfaction (Elisa & Saino, 2020; Laurent, 2016). Therefore:

*Hypothesis 16. Customer satisfaction mediates the relationships between electronic service quality, price, promotion, and digital service usage.*

#### **The moderating role of digital regulation**

The moderating role of digital regulation is grounded in Institutional Theory, which views institutions as systems of rules, norms, and practices that create legitimacy and stabilize behavior (Meyer & Scott, 1983; Scott, 1981). In digital service ecosystems, regulation provides procedural clarity, legal certainty, and safeguards for users. Prior studies suggest that formal rules

can influence customer evaluation and compliance behavior (Wardani & Nistiana, 2022; Yanti & Ratna, 2023). In this study, digital regulation is expected to strengthen the effect of customer satisfaction on actual usage because satisfied users are more likely to translate positive evaluations into behavior when supported by legitimate and reliable regulatory structures. Therefore:

*Hypothesis 17. Digital regulation positively moderates the relationship between customer satisfaction and digital service usage.*

Institutional Theory also suggests that institutions can facilitate or constrain behavior depending on how rules are designed and implemented (Greenwood & Hinings, 1996). In digital service adoption, regulation may strengthen the translation of intentions into actual use by providing legal clarity and protection. Prior studies indicate that regulatory frameworks can influence attitudes and behavioral realization (Faidani et al., 2023; Seminari & Ardani, 2018). Thus:

*Hypothesis 18. Digital regulation positively moderates the relationship between behavioral intention and digital service usage.*

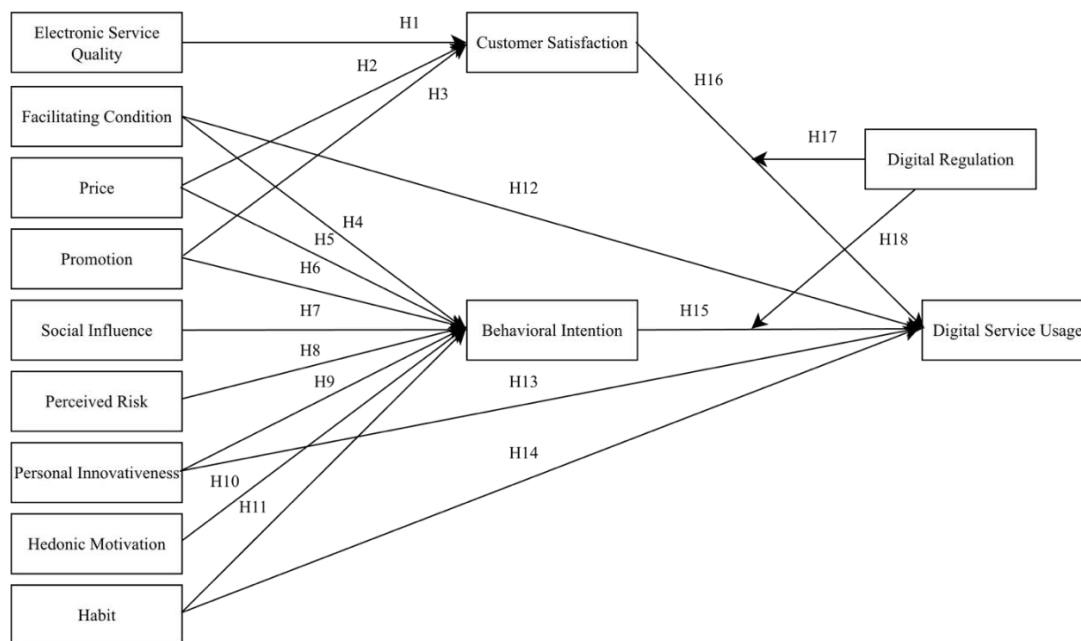
### **3.2 Research Model**

Based on the above arguments, this study proposes an integrated research model to explain digital service use by combining technological, marketing, behavioral, and institutional factors. The model consists of three endogenous constructs: customer satisfaction, behavioral intention, and digital service usage.

First, customer satisfaction is hypothesized to be influenced by electronic service quality, price, and promotion. Second, behavioral intention is hypothesized to be influenced by facilitating conditions, price, promotion, social influence, perceived risk, personal innovativeness, hedonic motivation, and habit. Third, digital service usage is hypothesized to be directly influenced by facilitating conditions, personal innovativeness, habit, customer satisfaction, and behavioral intention.

The model also includes two mediating mechanisms. Behavioral intention is expected to mediate the effects of the antecedent variables on actual usage, in line with TPB and UTAUT-based logic. Customer satisfaction is expected to mediate the effects of marketing- and service-related variables on usage behavior, in line with ECT. Finally, digital regulation is posited as a contextual moderator that shapes how customer satisfaction and behavioral intention translate into actual digital service usage.

**Figure 1 presents the conceptual research model and summarizes the hypothesized relationships among the constructs.**



#### 4. Methodology

##### 4.1 Operationalization of Constructs

This study employs a quantitative research design to examine the determinants of digital service usage within the context of digital public service transformation. The conceptual framework consists of several exogenous constructs, two mediating constructs, one dependent construct, and one moderating construct. As the theoretical foundations of these constructs have been elaborated in the previous section, this subsection focuses on the operationalization and measurement procedures used in the empirical analysis.

This research model incorporates electronic service quality, facilitating conditions, price, promotion, social influence, perceived risk, personal innovativeness, hedonic motivation, and habit as exogenous constructs. Customer satisfaction and behavioral intention are specified as mediating constructs, while digital service usage represents the dependent construct. In addition, digital regulation is incorporated as a moderating variable that may influence the relationship between psychological determinants and actual service usage behavior.

Most constructs employed in this study were adapted from established measurement scales

commonly used in the literature on technology adoption, digital service, and online consumer behavior. The indicators were selected based on theoretical relevance and empirical validation in prior studies.

However, several measurement indicators reflect contextual refinements derived from the researcher's direct field observations during the study's preliminary stage. These observations suggested that certain dimensions of user interaction in digital public service platforms were not fully captured by existing instruments widely used in technology adoption and marketing studies combined. Therefore, several indicators were refined to better reflect the characteristics of digital service interaction and user engagement in a mobile-based public service environment.

These contextual adaptations aim to enhance the model's explanatory power while maintaining theoretical consistency with the constructs introduced in the conceptual framework. All constructs were operationalized as reflective latent variables, each measured by multiple indicators. All items were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Prior to the main survey, the questionnaire was reviewed to ensure clarity, readability, and contextual relevance.

**Table 1. Measurement items and survey questionnaires**

Constructs	Measurement items	Sources
Electronic Service Quality	(ESQ1) The application menu helps me easily find the information I need.	Parasuraman et al., (2005)
	(ESQ2) The application loads pages quickly.	
	(ESQ3) The application functions well when I use it.	
	(ESQ4) The applications make it easy for users to perform transactions	
	(ESQ5) The system enables information to be easily accessed by users.	
	(ESQ6) The information provided by the application meets my needs.	
	(ESQ7) The application provides guarantees when service disruptions occur.	
	(ESQ8) I feel protected due to the guarantees provided by the service provider.	
	(ESQ9) I believe that reports submitted through the application are responded to promptly.	Self-developed
	(ESQ10) I can monitor the status of service handling in real time through the application.	
	(ESQ11) The application displays accurate estimates of service recovery time during disruptions.	
Facilitating Conditions	(FC1) I have a smartphone that allows me to use the application.	Faroq et al., (2018)
	(FC2) The application is compatible with my smartphone.	
	(FC3) I have adequate internet connectivity to use the application.	
	(FC4) I know how to use the application.	
	(FC5) I have access to mobile banking services.	
	(FC6) I understand how to conduct transactions using mobile banking.	
Price	(PV1) The application offers attractive value for conducting transactions	Self-developed
	(PV2) Transaction costs in the application are lower compared with other payment methods	
	(PV3) The payment flexibility offered by the application makes it appealing to use.	Faroq et al., (2018)
	(PV4) The application provides various payment methods (e.g., e-wallet, mobile banking, credit card).	Self-developed
	(PV5) I can pay my bills through the application at any time without additional charges.	
Promotion	(PR1) Promotional messages about the application are communicated clearly.	Rahmatika & Madiawati (2020)
	(PR2) Promotional messages are relevant to the application services.	
	(PR3) Programs promoted through digital channels meet my needs.	
	(PR4) Promotional offers encourage me to use the application.	
	(PR5) The service providers regularly offer promotional programs.	
Social Influence	(SI1) People close to me think that I should use the application.	Faroq et al., (2018)
	(SI2) People who influence me believe that I should use the application.	
	(SI3) People whose opinions I value prefer that I use the application.	
	(SI4) App store ratings influence my decision to download the application.	Self-developed
	(SI5) Positive user reviews convince me to try the application.	
	(SI6) The number of downloads increases my trust in the application.	
Perceived Risk	(PRK1) I feel that my personal information may not be adequately protected when using the application.	Al-Saedi et al. (2020)
	(PRK2) I am concerned that my personal data could be misused by other parties.	Self-developed

Constructs	Measurement items	Sources
	(PRK3) I hesitate to provide sensitive information through the application.	
	(PRK4) I feel uncomfortable using the service because others might access my data.	Al-Saedi et al. (2020)
	(PRK5) There is a possibility that errors may occur when using the system.	
Personal Innovativeness	(PI1) I enjoy experimenting with new technological features.	Farooq et al., (2018)
	(PI2) I am interested in trying newly introduced features in digital services.	
	(PI3) I often try new technologies before most people do.	Self-developed
	(PI4) I feel satisfied when I can use newly introduced digital features.	
	(PI5) I am usually among the first to adopt innovative transactions methods among my peers.	Farooq et al., (2018)
Hedonic Motivation	(HM1) Using the application is enjoyable for me.	
	(HM2) I enjoy the features offered by the application.	
	(HM3) Using the application feels comfortable and pleasant.	
	(HM4) Using the application makes me feel relaxed and stress-free.	Self-developed
	(HM5) I feel comfortable using the application to fulfill my needs.	
Habit	(HB1) I frequently use features available in the application.	Farooq et al., (2018)
	(HB2) I have become accustomed to using the application.	
	(HB3) I continue using the application even when I do not need all its features.	Self-developed
	(HB4) Whenever I need services, I use the application.	
	(HB5) Using the application has become a habit for me.	Farooq et al., (2018)
Customer Satisfaction	(CS1) Overall, I am satisfied with the digital service application.	Kotler & Keller (2016)
	(CS2) I feel proud to use the digital service platform.	
	(CS3) The service provided through the application makes my tasks easier.	
	(CS4) The application should continue maintaining service quality.	
	(CS5) My expectations when using the application are fulfilled.	Self-developed
Behavioral Intention	(BI1) I intend to continue using the application in the future.	Kim et al. (2005)
	(BI2) I plan to use the application regularly in the future.	
	(BI3) I believe that I will frequently use the application in the future.	Self-developed
	(BI4) I expect the application to become part of my daily activities.	
	(BI5) I will continue using the application frequently.	Al-Saedi et al. (2020)
Usage Behavior	(UB1) I frequently use the digital service application.	(Almarashdeh & Alsmadi, 2017)
	(UB2) I use the application whenever I need to conduct transactions.	
	(UB3) I often use the application for work-related tasks.	
	(UB4) I use the application to conduct transactions.	Self-developed
	(UB5) I use the application to access marketplace services.	
Digital Regulation	(DR1) I believe that my personal data are securely managed within the digital platform.	Regulatory framework
	(DR2) I understand my rights regarding the personal data I provide on digital platforms.	
	(DR3) I believe the platform complies with data protection regulations.	
	(DR4) I feel confident that transactions conducted through the platform are legally protected.	
	(DR5) I believe the system is designed to prevent misuse or data breaches.	

Constructs	Measurement items	Sources
	(DR6) I understand that digital consent within the application has legal validity.	
	(DR7) I believe the platform is officially registered in accordance with regulatory requirements.	
	(DR8) I believe the platform provider is responsible for the security and reliability of digital services.	
	(DR9) I believe digital platforms should collaborate with regulators in monitoring digital services.	

#### 4.2 Data Collection

Data were collected through a cross-sectional survey targeting users of a mobile-based digital public service application across several regions in Indonesia. The survey was distributed to respondents residing in Jakarta, East Java, Central Java & Yogyakarta, West Java, Bali, and Banten.

The questionnaire was distributed via online channels, including messaging applications and

email, with respondents receiving an introductory message containing a link to the online survey form. This method allowed respondents to complete the questionnaire conveniently using their mobile devices or personal computers. A total of 555 responses were obtained from the survey. After data screening, 542 responses were deemed valid and suitable for further analysis. Table 2 presents the distribution of responses across the targeted regions.

**Table 2. Survey response distribution by region**

Region	Responses	Valid data
Jakarta	51	48
East Java	112	112
Central Java & Yogyakarta	115	108
West Java	213	211
Bali	32	32
Banten	32	31
Total	555	542

The results indicate that the minimum sample requirement was achieved for all regions. Several regions exceeded the required number of respondents, with the largest contribution coming from West Java (211 valid responses), followed by East Java (112) and Central Java & Yogyakarta (108). This distribution suggests that the survey successfully captured responses from all targeted regions.

To provide a comprehensive overview of the respondent characteristics, demographic information was collected as part of the questionnaire. The variables include user experience with the digital service application, household electricity capacity, gender, education level, and monthly income.

**Table 3. Respondent demographic profile (n=542)**

Variable	Category	Frequency	Percentage
Length of application use	More than 1 year	518	93.33%
	6-12 months	10	1.80%
	Less than 6 months	14	2.52%
Household electricity capacity	More than 2,200 VA	409	73.69%
	1,300 VA	38	6.85%
	450/900 VA	108	19.46%
Gender	Male	431	77.66%
	Female	124	22.34%
Education level	High school or below	55	9.91%
	Diploma/Bachelor	426	76.76%
	Postgraduate	74	13.33%
Monthly income	< IDR 3,000,000	19	3.42%

	IDR 3,000,000 - 8,000,000	47	8.47%
	> IDR 8,000,000	489	88.11%

The results indicate that the majority of respondents have used the digital service application for more than one year, suggesting that most respondents possess sufficient experience to evaluate the platform. In addition, most respondents belong to households with relatively high electricity capacity and income levels, which may reflect greater familiarity with digital technology and electronic services. The demographic distribution also shows that respondents are predominantly male and highly educated, which may indicate relatively strong digital literacy within the sample.

**5. Results and Analysis**

**5.1 Measurement model**

The measurement model was evaluated to assess the reliability and validity of the constructs prior to structural model analysis. The assessment includes indicator reliability, internal consistency reliability, and convergent validity. Indicator reliability was

assessed using outer loadings. As shown in Table 4, most indicators exhibit loadings above the recommended threshold of 0.70, indicating that the observed variables adequately represent their respective latent constructs. Several indicators including CS4 (0.692) and UB5 (0.631), fall slightly below the preferred threshold and were removed to improve measurement accuracy. Internal consistency reliability was assessed using Cronbach’s Alpha (Cron. Alpha). As shown in Table 4, all constructs exceed the recommended threshold of 0.70, indicating satisfactory reliability. Convergent validity was evaluated using the Average Variance Extracted (AVE). An AVE value greater than 0.50 indicates that a construct explains more than half of the variance of its indicators, suggesting adequate convergent validity. These results collectively suggest that each construct explains a substantial proportion of variance in its indicators, thereby satisfying convergent validity requirements.

**Table 4. Reliability and validity**

Construct	Indicator	AVE	Cron. Alpha	Outer Loading	Construct	Indicator	AVE	Cron. Alpha	Outer Loading
Electronic Quality Service	ESQ1	0.638	0.943	0.796	Personal Innovativeness	PI1	0.723	0.904	0.854
	ESQ2			0.781		PI2			0.898
	ESQ3			0.802		PI3			0.833
	ESQ4			0.807		PI4			0.855
	ESQ5			0.846		PI5			0.807
	ESQ6			0.852	Hedonic Motivation	HM1	0.839	0.952	0.913
	ESQ7			0.810		HM2	0.921		
	ESQ8			0.834		HM3	0.910		
	ESQ9			0.715		HM4	0.912		
	ESQ10			0.752		HM5	0.925		
	ESQ11			0.779		Habit	HB1	0.734	0.909
Facilitating Conditions	FC1	0.854	HB2	0.869					
	FC2	0.891	HB3	0.776					
	FC3	0.859	HB4	0.860					
	FC4	0.843	HB5	0.898					
	FC5	0.803	Customer Satisfaction	CS1	0.836		0.935		
	FC6	0.871		CS2		0.905			
Price	PV1	0.653		0.866		0.849		CS3	0.929
	PV2					0.818		CS4	0.692
	PV3					0.862		CS5	0.878
	PV4		0.745		Behavioral Intention	BI1	0.808	0.941	0.867
	PV5		0.758			BI2			0.893
Promotion	PR1	0.776	0.927	0.911		BI3			0.920
	PR2			0.914		BI4			0.910
	PR3			0.916		BI5			0.902
	PR4			0.874	UB1	0.758	0.893	0.879	

Construct	Indicator	AVE	Cron. Alpha	Outer Loading	Construct	Indicator	AVE	Cron. Alpha	Outer Loading
Social Influence	PR5	0.684	0.907	0.782	Usage Behavior	UB2	0.792	0.967	0.906
	SI1			0.842		UB3			0.867
	SI2			0.839		UB4			0.789
	SI3			0.868		UB5			0.631
	SI4			0.741		Digital Regulation			DR1
	SI5			0.845	DR2		0.881		
SI6	0.823	DR3	0.899						
Perceived Risk	PRK1	0.815	0.944	0.848	DR4		0.910		
	PRK2			0.894	DR5	0.914			
	PRK3			0.921	DR6	0.909			
	PRK4			0.941	DR7	0.901			
	PRK5			0.908	DR8	0.923			
					DR9	0.834			

Overall, the measurement model demonstrates strong psychometric properties, with satisfactory levels of indicator reliability, internal consistency, and convergent validity. These results confirm that the constructs are robust and suitable for subsequent structural model evaluation.

As a preliminary step, the correlations among the latent constructs were examined to provide an overview of the linear associations within the proposed model. Although correlation analysis does not establish causality, it provides useful initial evidence of the consistency and direction of relationships among constructs prior to structural testing.

5.2 PLS analysis results and discussion

**Table 5. Correlation analysis**

	PV	PI	BI	HB	CS	FC	ESQ	SI	HM	UB	PR	DR	PRK
PV	1.000												
PI	0.583	1.000											
BI	0.518	0.592	1.000										
HB	0.664	0.718	0.741	1.000									
CS	0.665	0.664	0.766	0.826	1.000								
FC	0.439	0.447	0.519	0.528	0.504	1.000							
ESQ	0.731	0.623	0.640	0.750	0.785	0.493	1.000						
SI	0.689	0.666	0.672	0.746	0.745	0.518	0.733	1.000					
HM	0.711	0.747	0.653	0.798	0.813	0.440	0.752	0.736	1.000				
UB	0.654	0.679	0.752	0.849	0.782	0.489	0.750	0.704	0.747	1.000			
PR	0.796	0.637	0.601	0.743	0.768	0.467	0.816	0.778	0.780	0.723	1.000		
DR	0.635	0.670	0.626	0.757	0.770	0.454	0.741	0.695	0.760	0.743	0.726	1.000	
PRK	-0.27	-0.16	-0.21	-0.26	-0.31	-0.21	-0.29	-0.27	-0.26	-0.25	-0.31	-0.31	1.000

As shown in Table 5, the correlation ranges from -0.31 to 1.00, indicating varying degrees of association across constructs. Most of the core constructs exhibit moderate to high positive correlations, suggesting that they are meaningfully related yet conceptually distinct. For example, promotion shows relatively strong correlation with electronic service quality and usage behavior, while habit is strongly correlated with both behavioral intention and usage behavior. These patterns provide early support for the expectation that repeated usage patterns and service-related perceptions play an important role in digital service adoption.

Several notable correlations also emerge. Behavioral intention is strongly associated with habit and customer satisfaction, while usage behavior is strongly associated with habit, behavioral intention, and promotion. These findings are consistent with the logic of technology adoption and consumer behavior theories, in which intention and repeated behavior act as central mechanisms driving actual usage. In contrast, perceived risk shows weak negative correlations with most constructs, suggesting that risk perceptions are not strongly embedded in the model's overall nomological network. This already hints that perceived risk may play a limited

explanatory role in this context. Similarly, the interaction terms involving digital regulation show weaker correlations with the main constructs, as expected given their role as moderators rather than primary predictors. Overall, the correlation pattern provides preliminary evidence that the proposed model is conceptually coherent and that the main constructs are sufficiently associated to justify the subsequent structural analysis.

The mediating roles of behavioral intention and customer satisfaction were further examined through indirect effect analysis. This analysis helps clarify whether certain exogenous variables influence usage behavior through intermediate psychological mechanisms rather than solely through direct effects.

**Table 6. Indirect effect**

	T statistics	P values
Price → Behavioral Intention → Usage Behavior	1.622	0.105
Price → Customer Satisfaction → Usage Behavior	0.623	0.534
Personal Innovativeness → Behavioral Intention → Usage Behavior	0.460	0.646
Habit → Behavioral Intention → Usage Behavior	4.231	0.000
Facilitating Condition → Behavioral Intention → Usage Behavior	2.941	0.003
Electronic Service Quality → Customer Satisfaction → Usage Behavior	1.302	0.193
Social Influence → Behavioral Intention → Usage Behavior	2.780	0.005
Hedonic Motivation → Behavioral Intention → Usage Behavior	1.246	0.213
Promotion → Behavioral Intention → Usage Behavior	0.422	0.673
Promotion → Customer Satisfaction → Usage Behavior	1.265	0.206
Perceived Risk → Behavioral Intention → Usage Behavior	0.067	0.946

As shown in Table 6, only some mediation paths are statistically significant. Behavioral intention significantly mediates the effects of habit, facilitating conditions, and social influence on usage behavior. In particular, the indirect effect of habit → behavioral intention → usage behavior is highly significant ( $t=4.231, p<0.001$ ), indicating that routine behavior reinforces usage both directly and indirectly through stronger intention. Similar patterns are observed for facilitating conditions ( $t=2.941, p=0.003$ ) and social influence ( $t=2.780, p=0.005$ ), suggesting that supportive infrastructure and social endorsement increase actual usage by strengthening the intention to use the platform. By contrast, the indirect effects of price, promotion, hedonic motivation, perceived risk, and personal innovativeness through behavioral intention are not significant. These results indicate that these variables do not substantially shape usage behavior through intention in this context. Likewise, customer satisfaction does not function as a strong mediator. The indirect effects of electronic service quality → customer satisfaction → usage behavior and promotion → customer satisfaction → usage behavior are not significant. This suggests that while service quality and promotion improve satisfaction, satisfaction itself is not sufficient to translate these positive evaluations into continued usage behavior. Taken together, these findings imply that behavioral

intention is a more consistent and theoretically meaningful mediator than customer satisfaction. The role of intention appears particularly salient for variables related to routine, infrastructure, and social support, whereas satisfaction seems less effective at explaining continued behavior. To provide a concise overview of the empirical findings, Table 7 summarizes the results of all hypothesis tests. First, electronic service quality and promotion significantly improve customer satisfaction. Second, facilitating conditions, social influence, and especially habit significantly increase behavioral intention. Third, habit and behavioral intention significantly drive actual usage behavior. Fourth, digital regulation significantly moderates the effects of both customer satisfaction and behavioral intention on usage behavior, albeit in opposite directions. By contrast, price, perceived risk, personal innovativeness, and hedonic motivation do not emerge as significant determinants in most structural relationships. This finding indicates that the drivers of digital service usage in this setting are predominantly functional, behavioral, and institutional, rather than economic or hedonic. Overall, the empirical evidence points to a model in which service quality and promotion shape satisfaction, infrastructure and social influence shape intention, habit anchors both intention and actual behavior, and regulation conditions the

extent to which positive evaluations and intentions are converted into real usage.

**Table 7. Hypothesis result**

Hypothesis	Coef.	T stat.	P Values	Significant
H1. Electronic Service Quality → Customer Satisfaction	0.464	7.445	0.000	Accepted
H2. Price → Customer Satisfaction	0.043	0.850	0.395	Not Accepted
H3. Promotion → Customer Satisfaction	0.356	5.108	0.000	Accepted
H4. Facilitating Condition → Behavioral Intention	0.143	3.892	0.000	Accepted
H5. Price → Behavioral Intention	-0.085	1.786	0.074	Not Accepted
H6. Promotion → Behavioral Intention	-0.025	0.439	0.661	Not Accepted
H7. Social Influence → Behavioral Intention	0.234	3.591	0.000	Accepted
H8. Perceived Risk → Behavioral Intention	-0.002	0.071	0.944	Not Accepted
H9. Personal Innovativeness → Behavioral Intention	0.025	0.491	0.624	Not Accepted
H10. Hedonic Motivation → Behavioral Intention	0.114	1.354	0.176	Not Accepted
H11. Habit → Behavioral Intention	0.457	6.582	0.000	Accepted
H12. Facilitating Condition → Usage Behavior	-0.012	0.435	0.664	Not Accepted
H13. Personal Innovativeness → Usage Behavior	0.062	1.494	0.135	Not Accepted
H14. Habit → Usage Behavior	0.455	7.109	0.000	Accepted
H15. Behavioral Intention → Usage Behavior	0.211	4.976	0.000	Accepted
H16. Customer Satisfaction → Usage Behavior	0.079	1.337	0.181	Not Accepted
H17. Digital Regulation * Customer Satisfaction → Usage Behavior	0.084	1.999	0.046	Accepted
H18. Digital Regulation * Behavioral Intention → Usage Behavior	-0.099	2.412	0.016	Accepted

## 6. Conclusions

This study investigates the key determinants of digital service usage within a public utility context using a Partial Least Squares Structural Equation Modeling (PLS-SEM) approach. The results demonstrate a robust model with substantial explanatory power, particularly in predicting usage behavior. The findings reveal that habit emerges as the most influential determinant, significantly affecting both behavioral intention and actual usage. This indicates that sustained engagement with digital services is primarily driven by routinized behavior rather than one-time cognitive evaluation. Although behavioral intention remains a significant predictor of usage, its influence is comparatively weaker, suggesting that intention alone is insufficient without the reinforcement of repeated behavior.

At the antecedent level, electronic service quality and promotion are found to significantly enhance customer satisfaction, confirming the importance of service performance and communication effectiveness. However, customer satisfaction does not directly translate into usage behavior, suggesting a satisfaction-behavior gap. Furthermore, facilitating conditions and social influence significantly influence behavioral intention, emphasizing the importance of infrastructure readiness and social context in shaping user intention. In contrast, variables such as price, perceived risk, personal innovativeness, and hedonic motivation are not significant, suggesting that in essential service settings, functional and contextual factors outweigh economic and psychological drivers commonly highlighted in the commercial context.

A notable contribution of this study lies in the role of digital regulation as a moderating variable. The findings indicate a dual effect: regulation strengthens the relationship between customer satisfaction and usage behavior while simultaneously weakening the relationship between behavioral intention and usage. This suggests that regulatory frameworks function not merely as external constraints but as contextual forces that can both facilitate and inhibit the translation of user perceptions and intentions into actual behavior, depending on how they are implemented within the system.

From a theoretical perspective, this study extends existing technology adoption, marketing, and customer behavior literature by integrating habit formation and institutional context into the analytical framework. The findings demonstrate that behavioral repetition and regulatory environments are critical yet underexplored determinants, particularly in the context of utility-based digital services. This contributes to a more nuanced understanding of digital adoption beyond traditional models such as TAM and UTAUT, which tend to emphasize cognitive and attitudinal factors.

From a practical standpoint, the results highlight the importance of prioritizing service reliability, seamless user experience, and habit-forming mechanisms to encourage sustained usage. In addition, aligning regulatory compliance with user-centered design is essential to avoid excessive complexity that may hinder actual usage. Organizations should focus on simplifying user journeys, reinforcing repeated interactions, and leveraging social influence to strengthen adoption and retention strategies.

Despite its contributions, this study has several limitations. First, the use of a cross-sectional design restricts the ability to capture dynamic behavioral changes over time. Second, the reliance on self-reported data may introduce common method bias. Third, the focus on a public utility context limits the generalizability of the findings to other sectors, particularly those with different competitive and regulatory environments.

Accordingly, future research is recommended to employ longitudinal or experimental designs to better capture behavioral dynamics and causal mechanisms. The integration of objective behavioral data, such as system logs and transaction records, is also encouraged to complement perceptual measures. Furthermore, future studies should consider incorporating additional constructs, such as trust, perceived usefulness, and privacy concerns, and should

conduct multi-group analyses to explore heterogeneity across user segments. These approaches will provide a more comprehensive and generalizable understanding of digital service adoption.

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