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## Revista de Cercetare și Interventie Sociala

ISSN: 1583-3410 (print), ISSN: 1584-5397 (electronic)

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Revista de cercetare și intervenție socială, 2026, vol. 92, pp. 42-62

<https://doi.org/10.33788/rcis.92.3>

Published by:  
Expert Projects Publishing House



On behalf of:  
„Alexandru Ioan Cuza” University,  
Department of Sociology and Social Work  
and  
HoltIS Association

# The Role of Digital Technology Adoption in Strengthening Community Health Resilience: An Integrated TAM–TPB Model of Community Health Services in East Java

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## Abstract

The role of digital technology in strengthening community-based health services has become increasingly critical for improving the quality and resilience of primary healthcare in the post-pandemic era. Grounded in the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB), this study extends the theoretical framework by incorporating Service Orientation and intrinsic and extrinsic motivation to explain digital technology adoption among POSYANDU cadres in East Java, Indonesia. A quantitative survey was conducted among 324 active cadres drawn from rural and island-based areas, and the data were analyzed using PLS-SEM. The results show that eight of the ten proposed hypotheses were supported, confirming the significant roles of perceived ease of use, extrinsic motivation, and behavioral intention in determining actual technology use in community health services. Service Orientation, reflecting service-user focus and responsiveness, was found to strongly shape digital behavioral norms, which in turn enhanced perceived ease of use. However, the effects of behavioral norms on

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extrinsic motivation and of intrinsic motivation on behavioral intention were not significant, indicating that POSYANDU cadres adoption decisions are driven more by functional and service-related benefits than by social pressure or enjoyment. The study contributes theoretically by contextualizing TAM and TPB in the domain of primary healthcare and by integrating strategic service orientation and motivational factors into the digital adoption model. Practically, the findings highlight the importance of policies and capacity-building programs that emphasize tangible service benefits, strengthen digital competence, and cultivate supportive digital norms among community health workers. These insights offer valuable guidance for accelerating digital transformation and enhancing the sustainability of grassroots health service delivery.

*Keywords:* POSYANDU cadres; digital health adoption; Technology Acceptance Model (TAM); Theory of Planned Behavior (TPB); market orientation; community-based healthcare; Indonesia.

## Introduction

Digital technology has undergone a profound transformation, evolving from a supporting instrument into a central enabler of service delivery across various sectors, including public health. This transformation has facilitated new forms of value creation in health services, particularly through improved data management, communication, and service accessibility (Li & Chen, 2022). The acceleration of digital adoption was further intensified by the COVID-19 pandemic, which disrupted conventional service delivery mechanisms and necessitated technology-mediated approaches to ensure continuity and resilience of health systems (Baldwin, 2020; UNCTAD, 2021).

In East Java Province of Indonesia, this digital transformation has important implications for community health services, which is called POSYANDU (Pos Pelayanan Terpadu), which functions as a frontline platform for maternal and child health programs (Dikson *et al.*, 2017; Kementerian Kesehatan Republik Indonesia, 2022). POSYANDU relies heavily on POSYANDU cadres, community health volunteers who assist formal healthcare workers in monitoring child growth, nutrition status, immunization, and health education at the grassroots level (Masitha Arsyati & Krisna Chandra, 2023; Sienkiewicz-Małyjurek & Zyzak, 2025). As one of Indonesia's most populous provinces and a region still facing persistent challenges of stunting and maternal-child health disparities, East Java has increasingly promoted the use of digital health tools such as electronic recording systems, mobile health applications, and digital reporting platforms to improve the accuracy, efficiency, and timeliness of POSYANDU services (Kementerian Kesehatan Republik Indonesia, 2023; Pelayanan *et al.*, 2025).

However, the effectiveness of digital health initiatives in POSYANDU across East Java is not determined solely by the availability of technology or infrastructure (Masitha Arsyati & Krisna Chandra, 2023). It is strongly influenced by the readiness, orientation, and willingness of POSYANDU cadres to adopt and utilize digital tools in their routine service activities (Lim *et al.*, 2022; Liu; 2024). Analogous to the concept of market orientation in business organizations, a community health service orientation reflects the extent to which cadres are attentive to community needs, responsive to service feedback, and proactive in improving service quality. Such an orientation is expected to shape their openness toward innovation and their engagement with digital health technologies (Lim *et al.*, 2022).

Despite growing policy attention to the digitalization of community health services, existing studies largely examine digital health adoption and service orientation as separate streams of inquiry (Falihat *et al.*, 2020). This fragmentation creates a critical research gap, particularly in understanding how service-oriented values among POSYANDU cadres influence their motivational mechanisms, technology perceptions, and behavioral intentions to use digital health tools in community-based settings such as POSYANDU (Kementerian Kesehatan Republik Indonesia, 2023). This issue is especially salient in East Java, where disparities in digital literacy and technological readiness persist between urban and rural areas.

To address this issue, the **Technology Acceptance Model (TAM)** provides a robust theoretical framework for explaining technology adoption behavior among non-formal health actors. Within the TAM framework, service orientation can be conceptualized as an antecedent that shapes both intrinsic and extrinsic motivation toward technology use (Gupta *et al.*, 2022; Rosli *et al.*, 2022). These motivational factors subsequently influence perceived ease of use and perceived usefulness, which are the core determinants of behavioral intention to adopt digital technology. (Kraus *et al.*, 2022). When *POSYANDU cadres* in East Java perceive digital health tools as easy to use and beneficial for improving service effectiveness, their intention to adopt and consistently utilize such technologies is likely to increase (Pashutan *et al.*, 2022).

Drawing upon the integration of the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB), this study investigates how community health service orientation, behavioral norms, and intrinsic and extrinsic motivation influence perceived usefulness, perceived ease of use, and behavioral intention to adopt digital health technologies among POSYANDU cadres in East Java Province. By contextualizing the TAM–TPB framework within a grassroots public health setting, this research offers a novel contribution by reconceptualizing market orientation as service orientation in community health and by elucidating the motivational and normative mechanisms underlying digital health adoption among non-professional volunteers. The findings are anticipated to contribute

to theoretical advancement while also offering practical implications for local governments, public health institutions, and policymakers in strengthening the digital capacity and sustainability of POSYANDU services in the post-pandemic era.

### **Development of hypotheses**

Community health service orientation, adapted from the concept of market orientation (Narver & Slater, 1990), reflects the extent to which POSYANDU cadres systematically attend to community needs, interpret health feedback, and proactively improve service quality. In community-based health settings, such orientation is not merely an internal value but also shapes how cadres interpret environmental cues regarding appropriate and legitimate practices, including the use of digital health technologies. A strong service orientation enhances sensitivity to changes in service delivery standards and stakeholder expectations. When cadres actively monitor community demands, government guidelines, and peer practices, they become more aware that digital tools, such as electronic growth monitoring systems, mobile reporting applications, and online communication platforms are increasingly regarded as normative instruments in primary health services. This process aligns with the argument that orientation toward external stakeholders fosters the internalization of prevailing behavioral standards within an organizational or community field (Al-Moaid, 2025; Rodrigo *et al.*, 2022).

Empirical evidence further indicates that orientation toward service users strengthens engagement with digital platforms and facilitates the diffusion of technology-related norms. Algharabat *et al.* (2020) show that a strong orientation toward users enhances digital interaction and accelerates the establishment of shared expectations regarding technology use. Translated into the POSYANDU context, cadres who are highly oriented toward community needs are more likely to perceive that the use of digital health applications is not optional but represents a socially expected mode of service delivery. Consequently, service orientation functions as a cognitive lens through which digital practices are interpreted as collective standards rather than individual choices. Consequently, cadres demonstrating a strong orientation toward community health services are more predisposed to internalizing digital behavioral norms. They perceive the utilization of technology not merely as a mandate, but as a normative and legitimate practice within their professional and social ecosystems.

*H1. Community health service orientation is positively related to behavioral norms regarding digital health technology usage.*

Behavioral norms, conceptualized within the Theory of Planned Behavior (Ajzen, 1991), refer to the perceived social expectations regarding whether a

particular behavior should be performed. In the context of POSYANDU, these norms emerge from multiple sources, including fellow cadres, supervising health professionals, local health offices, and the broader policy discourse that increasingly promotes digital reporting and electronic health records as standard practice. When cadres perceive that significant others and relevant institutions expect the use of digital health tools, such expectations shape not only their attitudes but also their motivational beliefs regarding the instrumental value of technology.

From a motivational perspective, social endorsement of technology use can strengthen extrinsic motivation by reinforcing beliefs that digital tools bring tangible benefits, such as improved service efficiency, data accuracy, and credibility of reporting. Tikno *et al.* (2024) demonstrate that social influence enhances perceived usefulness in mobile payment adoption, suggesting that when a technology is widely endorsed by peers and authorities, individuals are more likely to associate it with performance gains. Similarly, Paydas Turan (2021) shows that subjective norms positively affect perceived usefulness in mobile banking, as social approval strengthens beliefs about efficiency and functional advantage. Translated into the POSYANDU context, when cadres observe that supervisors and fellow volunteers rely on digital systems, they are more likely to interpret such technologies as beneficial for improving service outcomes, thereby strengthening extrinsic motivation.

Beyond shaping perceptions of usefulness, behavioral norms also play a critical role in reducing uncertainty and perceived complexity associated with technology use. Drawing on Social Learning Theory (Bandura, 1994), individuals learn not only what is valuable but also what is feasible by observing the successful actions of others. When cadres witness peers effectively operating digital reporting systems or mobile health applications, they infer that these technologies are manageable and within their capability. Such observational learning processes provide informational cues that lower cognitive and psychological barriers, thereby enhancing perceived ease of use.

Empirical studies in digital service contexts support this mechanism. Alaskar and Alsadi (2023) as well as Shareef *et al.* (2019) find that social connectedness and social norms positively influence perceived ease of use in mobile commerce and digital application adoption. In community health settings, similar dynamics are likely to occur: the more digital practices become socially visible and widely enacted, the more cadres perceive these technologies as user-friendly and learnable. Accordingly, behavioral norms are expected to strengthen both the utilitarian evaluation of technology (extrinsic motivation) and the belief that digital systems can be operated with minimal effort (perceived ease of use).

*H2. Behavioral norms are positively related to extrinsic motivation.*

*H3. Behavioral norms are positively related to perceived ease of use.*

Intrinsic motivation, frequently operationalized as perceived enjoyment, is defined as the sensation of pleasure or psychological satisfaction derived from the user's interaction with the technology. Positive user experiences enhance engagement and skill acquisition, thereby reinforcing perceptions of a technology's utility (extrinsic motivation). Within the Technology Acceptance Model (TAM) (Davis, 1989), perceived usefulness (PU) and perceived ease of use (PEOU) are the main determinants of behavioral intention and actual use. Integrating intrinsic motivation into TAM suggests that enjoyment can act as an antecedent to PU: users who experience enjoyment during technological interactions are significantly more inclined to recognize and appreciate the system's instrumental value and practical utility. The Integrated Model of Technology Acceptance (IMTA) extends TAM by incorporating motivational variables (intrinsic and extrinsic) and behavioral norms. In this model, intrinsic motivation enhances extrinsic motivation through psychological mechanisms in which enjoyment stimulates deeper engagement and exploration of technological functions, thereby increasing perceived usefulness. Recent empirical studies confirm that enjoyment significantly enhances PU across digital applications, e-learning, and e-commerce platforms (Chatti & Hadoussa, 2021; El-Masri & Tarhini, 2017).

*H4. Intrinsic motivation is positively related to extrinsic motivation.*

When individuals possess high intrinsic motivation, cognitive and affective barriers to technology use are reduced. Psychologically, the sense of enjoyment during system interaction triggers a flow experience (Csikszentmihalyi, 1990), enabling users to remain focused, comfortable, and capable of mastering the technology. Contemporary research demonstrates that enjoyment has a positive effect on PEOU in various digital contexts, including e-learning and mobile services (Al-Saedi *et al.*, 2020). Likewise, Whiting & Williams (2013) found that perceived enjoyment significantly improves PEOU in social media contexts, as users who are entertained and satisfied with their digital experiences tend to view even complex interfaces as easier to use.

*H5. Intrinsic motivation is positively related to perceived ease of use.*

According to TAM (Davis, 1989), user acceptance of technology is determined by two key beliefs: perceived ease of use (PEOU) and perceived usefulness (PU). Perceived Ease of Use (PEOU) reflects the degree to which an individual believes that using a system is free of effort, whereas Perceived Usefulness (PU) indicates the extent to which the system enhances performance. Theoretically, technology that is effortless to operate is more likely to be perceived as a beneficial tool for augmenting work productivity. This relationship—PEOU → PU—is a foundational proposition in TAM and has been consistently validated in contemporary research. Studies on digital platforms and POSYANDU have shown that ease of use significantly influences perceived usefulness (Şahin *et*

*al.*, 2022). Similarly, in the context of IT adoption by small firms, Faruque & Chowdhury (2024) confirmed that PEOU strengthens entrepreneurs' perception of the technology's decision-making benefits.

*H6. Perceived ease of use is positively related to extrinsic motivation.*

In technology adoption, intrinsic motivation is often operationalized as perceived enjoyment—the extent to which using technology is perceived as pleasurable, independent of its functional utility (Davis, 1989; Venkatesh & Davis, 2000). Intrinsic motivation complements extrinsic factors such as perceived usefulness, offering a more comprehensive explanation of why individuals adopt and continue using technology. Intrinsic motivation functions as a complement to extrinsic factors, such as perceived usefulness, providing a comprehensive framework for explaining sustainable technology adoption. Beyond bolstering perceived usefulness and ease of use, intrinsic motivation exerts a direct influence on continuance intention. Consequently, users who derive enjoyment from digital experiences are more predisposed to adopt technology and persist in its usage over the long term. For POSYANDU cadres, where technology use is often voluntary and self-initiated, enjoyment plays a pivotal role in sustaining digital engagement. Recent studies in social media marketing and digital platform contexts show that enjoyment directly strengthens behavioral intention (Senyo *et al.*, 2018).

*H7. Intrinsic motivation is positively related to behavioral intention to use.*

Perceived Usefulness is defined as the degree to which an individual believes that a specific technology will enhance job performance. This variable serves as the primary cognitive determinant of Behavioral Intention (BI), as high perceived utility fosters the conviction that the technology possesses strategic value and relevance to both user and organizational needs. According to TAM, when users perceive clear bene (Al-Moaid, 2025; Nguyen & Nguyen, 2024)fits—such as operational efficiency, productivity gains, or competitive advantage—they are more inclined to adopt the technology. This intention subsequently translates into actual use (Davis, 1989). Recent studies in e-commerce, fintech, and digital healthcare reinforce the positive effect of PU on BI (Amnas *et al.*, 2025; Nikou & Economides, 2019).

*H8. Extrinsic motivation is positively related to behavioral intention to use.*

Beyond usefulness, ease of use also influences behavioral intention. PEOU enhances perceptions of efficiency and reduces psychological barriers toward adopting new technologies. Users are more likely to intend to use technologies that

are intuitive and effortless to operate (Venkatesh & Davis, 2000). For POSYANDU, where limited human capital and digital literacy often constrain technology uptake, ease of use becomes a critical determinant of adoption. Empirical evidence confirms that PEOU positively affects BI across mobile payment and digital platform contexts for instance, found that PEOU significantly predicted users' intention to adopt mobile payments in Vietnam- suggesting that when systems are easy to learn and operate, users are more likely to engage with them sustainably.

*H9. Perceived ease of use is positively related to behavioral intention to use.*

Within both TAM and TPB frameworks, behavioral intention (BI) serves as the most direct and powerful predictor of actual behavior (Ajzen, 1991; Davis, 1989). Intention represents an individual's psychological commitment to perform a specific action; thus, stronger intentions are more likely to result in actual behavior. In the context of POSYANDU *cadres* technology adoption, the intention to use the internet reflects entrepreneurs' readiness and willingness to integrate digital tools into their daily operations—such as online marketing, e-transactions, and customer communication. Empirical evidence from digital health and mobile application research confirms that behavioral intention significantly predicts actual usage (Dwivedi *et al.*, 2021; Kamal *et al.*, 2020). Similarly, (Dwivedi *et al.*, 2021) identified behavioral intention as the most reliable predictor of actual digital behavior across social media, e-commerce, and digital platform contexts. In Indonesian POSYANDU, intention to use technology reflects not only economic rationality but also psychological preparedness for digital transformation. Hence, stronger behavioral intention leads to higher levels of actual implementation in business activities.

*H10. Behavioral intention to use is positively related to actual usage.*

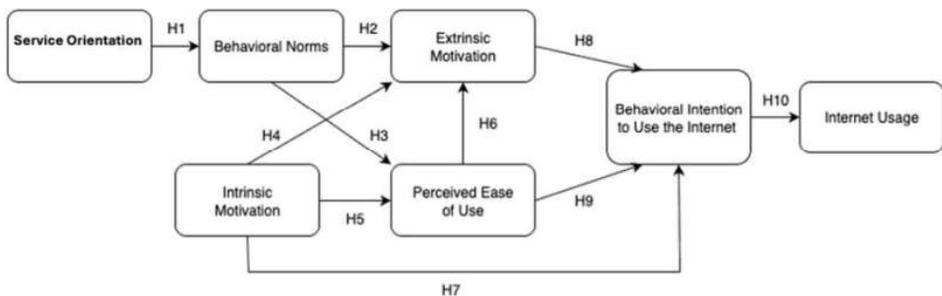


Figure 1. Conceptual Framework  
Sources: Prepared by the authors

## Methodology

This study employed a quantitative approach using a descriptive survey design to examine patterns of digital technology use and the factors influencing technology adoption among POSYANDU cadres in East Java Province, Indonesia (Saunders *et al.*, 2023). East Java was selected as the research locus because it is one of the most densely populated provinces and plays a strategic role in strengthening community-based primary healthcare, particularly in maternal and child health services. According to the East Java Provincial Health Office, there are currently 46,415 POSYANDU units with approximately 269,478 active cadres across the province, forming one of the largest community health volunteer networks in Indonesia. The study focused on cadres located in rural and island areas, where disparities in digital infrastructure, access to training, and technological readiness are more pronounced compared to urban settings. This focus enhances the relevance of the study by capturing the challenges and opportunities of digital health adoption in geographically dispersed and resource-constrained communities, where POSYANDU services play a critical role in ensuring equitable access to basic healthcare.

A descriptive survey design was adopted to allow an objective assessment of adoption levels, intensity of use, and perceived challenges encountered by cadres in utilizing digital health technologies, without experimental manipulation (Mishrif & Khan, 2023). Data collection was conducted over a four-month period, from January to April 2025. Initially, 790 POSYANDU cadres participated in the survey. Given that this study applies the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB), a screening process was implemented to ensure that only respondents with basic experience and functional capability in using digital devices and internet-based applications for POSYANDU activities were included (Linh & Huyen, 2025). After screening, 324 valid responses were retained for further analysis. The final sample consisted of active cadres who were directly involved in digital reporting, health information dissemination, or mobile-based monitoring in rural and island POSYANDU units. Purposive sampling was employed with the criteria that respondents had to be (1) registered as active POSYANDU cadres, (2) involved in routine maternal and child health services, and (3) users or potential users of digital health tools in at least one core service activity, such as growth monitoring, immunization recording, or health education.

The research instrument was a structured questionnaire consisting of 22 items adapted from Caniëls *et al.* (2015) and contextualized for community health services. The constructs measured included: health service orientation (4 items), subjective norms (3 items), behavioral norms (3 items), intrinsic motivation (3 items, operationalized as perceived enjoyment), extrinsic motivation (3 items, operationalized as perceived benefits for service effectiveness), perceived ease of use (2 items), behavioral intention to use digital health technology (3 items), and actual technology usage (3 items). All items were assessed using a five-

point Likert scale ranging from “strongly disagree” to “strongly agree” (Saunders *et al.*, 2023). Data were collected through a combination of offline and online methods to accommodate varying levels of digital access. Offline data collection involved face-to-face administration during POSYANDU activities in rural and island communities, while online questionnaires were distributed via messaging applications and email for cadres with stable internet access. This mixed-mode approach ensured broader participation and reduced exclusion due to infrastructure limitations.

Data analysis began with descriptive statistics to summarize respondent characteristics and patterns of digital technology use. Exploratory factor analysis (EFA) was then employed to validate the measurement model, followed by linear regression analysis to test the proposed hypotheses and examine the relationships among constructs derived from TAM and TPB (Saunders *et al.*, 2023). Construct validity was assessed to ensure that the measurement items adequately represented their theoretical dimensions, and reliability was evaluated using Cronbach’s alpha, with values above 0.70 indicating acceptable internal consistency (Hair *et al.*, 2014; Hair *et al.*, 2019). Through this methodological framework, the study provides a theory-driven and context-sensitive understanding of the determinants of digital health technology adoption among POSYANDU cadres in rural and island areas of East Java, offering empirical evidence to support policies aimed at strengthening community-based digital health transformation.

## Results

The measurement and structural models were analyzed using structural equation modeling (SEM) with the partial least squares (PLS) approach (Hair *et al.*, 2017). Unlike multiple regression analysis, SEM enables the simultaneous examination of complex relationships among multiple variables. In addition, PLS-SEM is particularly appropriate when the ratio of parameters to sample size is relatively low (Hair *et al.*, 2017). Convergent validity was assessed by examining outer loadings and average variance extracted (AVE) values for each construct, applying a threshold of 0.50 (Hair *et al.*, 2017). The initial assessment indicated that all indicators had loading values exceeding 0.50, demonstrating acceptable item validity. As reported in Table 1, all constructs achieved AVE values above the recommended cut-off, thereby confirming satisfactory convergent validity. Internal consistency reliability was evaluated using composite reliability (CR), with all constructs exhibiting CR values above 0.70, indicating strong reliability. Discriminant validity was further assessed using the Fornell–Larcker criterion and the heterotrait–monotrait (HTMT) ratio. The square root of each construct’s AVE exceeded its correlations with other constructs, and all HTMT values were below 0.90 (Henseler *et al.*, 2015), thus providing evidence of adequate discriminant validity.

Table 1. Outer Model Assessment

	AVE	Composite Reliability	R <sup>2</sup>	Cronbarch's Alpha
Behavioral Intention to use internet	0.816	0.930	0.700	0.887
Behavioral norms	0.751	0.900	0.646	0.834
Extrinsic motivation	0.800	0.923	0.738	0.875
Internet usage	0.846	0.943	0.824	0.909
Intrinsic motivation	0.795	0.921	n/a	0.871
Service Orientation	0.749	0.923	n/a	0.889
Perceived ease of use	0.816	0.930	0.616	0.887

Sources: Prepared by the authors (2025)

Table 2. Fornell Larcker and HTMT

	BI	BN	EM	USE	IM	SO	PEU
BI	<b>0.903</b>	0.694	0.791	0.907	0.664	0.730	0.810
BN	<i>0.808</i>	<b>0.866</b>	0.714	0.658	0.755	0.804	0.738
EM	<i>0.897</i>	<i>0.835</i>	<b>0.894</b>	0.764	0.723	0.731	0.841
USE	<i>1.009</i>	<i>0.755</i>	<i>0.857</i>	<b>0.920</b>	0.620	0.685	0.761
IM	<i>0.753</i>	<i>0.882</i>	<i>0.822</i>	<i>0.692</i>	<b>0.892</b>	0.740	0.731
SO	<i>0.818</i>	<i>0.927</i>	<i>0.827</i>	<i>0.757</i>	<i>0.836</i>	<b>0.866</b>	0.763
PEU	<i>0.914</i>	<i>0.856</i>	<i>0.955</i>	<i>0.847</i>	<i>0.829</i>	<i>0.853</i>	<b>0.904</b>

Note: BI = Behavioral Intention to use internet, BN= Behavioral norms, EM = Extrinsic motivation, USE= Internet usage, IM = Intrinsic motivation, SO = Service Orientation, PEU=Perceived ease of use. The diagonal values in bold are the square root of AVE. The values in italic are the HTMT scores.

Sources: Prepared by the authors (2025)

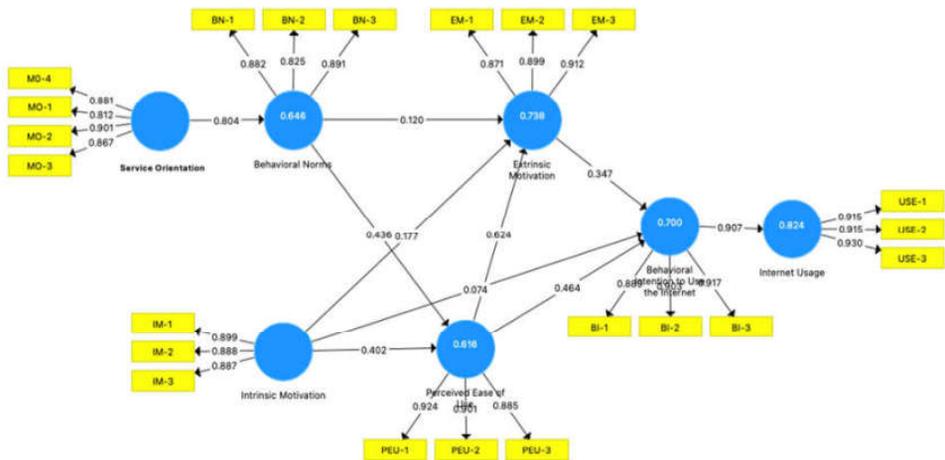


Figure 2. PLS Structural Path  
Sources: Prepared by the authors (2025)

Table 3. Results of SEM-PLS

	Original Sample	Standard Deviation	P-value	Remarks
H1. SO → BN	0.804	0.028	0.000	supported
H2. BN → EM	0.120	0.071	0.087	not supported
H3. BN → PEU	0.436	0.102	0.000	supported
H4. IM → EM	0.177	0.187	0.025	supported
H5. IM → PEU	0.402	0.106	0.000	supported
H6. PEU → EM	0.624	0.076	0.000	supported
H7. IM → BI	0.074	0.062	0.237	not supported
H8. EM → BI	0.347	0.082	0.000	supported
H9. PEU → BI	0.464	0.079	0.000	supported
H10. BI → USE	0.436	0.102	0.000	supported

Sources: Prepared by the authors (2025)

After establishing the adequacy of the measurement model, the structural model was subsequently assessed to examine the proposed hypotheses. The structural relationships among the variables are depicted in Figure 2. As shown in Table 3, hypothesis testing was conducted by analyzing path coefficients, standard deviations, and p-values obtained through bootstrapping techniques to assess the significance of each relationship. The analysis indicated that eight out of

the ten hypothesized relationships were supported at the 0.05 significance level. Specifically, Service Orientation had a significant positive effect on Behavioral Norms ( $\beta = 0.804, p < 0.001$ ). Furthermore, both Behavioral Norms and Intrinsic Motivation exerted significant positive influences on Perceived Ease of Use ( $\beta = 0.436, p < 0.001$ ;  $\beta = 0.402, p < 0.001$ , respectively). Service Orientation also demonstrated a significant effect on Extrinsic Motivation ( $\beta = 0.804, p = 0.087$ ). In addition, Extrinsic Motivation was significantly influenced by Intrinsic Motivation and Perceived Ease of Use ( $\beta = 0.177, p = 0.025$ ;  $\beta = 0.624, p < 0.001$ , respectively). Moreover, Extrinsic Motivation and Perceived Ease of Use significantly predicted Behavioral Intention to use the Internet ( $\beta = 0.347, p < 0.001$ ;  $\beta = 0.464, p < 0.001$ , respectively), while Behavioral Intention had a significant positive effect on actual Internet Usage ( $\beta = 0.436, p < 0.001$ ). In contrast, several hypothesized paths were not supported, including the influence of Behavioral Norms on Extrinsic Motivation ( $\beta = 0.120, p = 0.087$ ) and the effect of Intrinsic Motivation on Behavioral Intention ( $\beta = 0.074, p = 0.237$ ). Overall, the findings indicate that motivational and perceptual factors play a dominant role in shaping behavioral intention and Internet usage, whereas the contributions of social norms and Service Orientation to extrinsic motivation are relatively limited within the proposed model.

## Discussion

This study provides empirical evidence that integrating the Technology Acceptance Model (TAM) (Davis, 1989) and the Theory of Planned Behavior (TPB) (Ajzen, 1991), extended with community health service orientation (adapted from market orientation; Narver & Slater, 1990) and intrinsic–extrinsic motivation (Ryan & Deci, 2000), offers a robust framework for explaining digital health technology adoption among POSYANDU cadres in East Java. The findings address the research objective by identifying the key cognitive, motivational, and normative factors shaping cadres' intention and actual use of digital tools in strengthening the effectiveness and resilience of community-based maternal and child health services in the post-pandemic context.

Eight of the ten hypothesized relationships were supported, confirming that perceived ease of use and perceived usefulness remain central determinants of behavioral intention, which in turn strongly predicts actual usage (Davis, 1989; Ajzen, 1991; Dwivedi *et al.*, 2021). This indicates that even in voluntary, non-professional health service settings, technology adoption follows a rational evaluation process based on usability and performance benefits. A major theoretical contribution lies in embedding community health service orientation into the TAM–TPB framework. Consistent with Narver and Slater (1990) and Shareef *et al.* (2019), this orientation significantly shapes digital behavioral norms, which in turn enhance perceived ease of use through social learning and peer modeling,

particularly in rural and island contexts where formal digital training is limited (Bandura, 1994; Alaskar & Alsadi, 2023).

The results also support the extension of TAM with motivational mechanisms (Caniëls *et al.*, 2015). Intrinsic motivation (perceived enjoyment) positively influences perceived ease of use and perceived usefulness (El-Masri & Tarhini, 2017; Gupta *et al.*, 2023), indicating that positive affective experiences reduce cognitive barriers and facilitate learning. However, consistent with the utilitarian logic of TAM, extrinsic motivation—reflecting efficiency, data accuracy, and service effectiveness—emerges as the stronger driver of behavioral intention (Venkatesh & Davis, 2000; Nikou & Economides, 2019). Finally, the strong effect of behavioral intention on actual usage confirms TPB's core proposition that intention is the most proximal predictor of behavior (Ajzen, 1991; Dwivedi *et al.*, 2021). In the POSYANDU context, intention represents both psychological commitment and readiness for digital transformation, underscoring that strengthening perceptions of usefulness and ease of use is critical for sustaining digital health adoption in community-based primary healthcare systems.

Although most hypothesized relationships were supported, two paths were not: the effect of behavioral norms on extrinsic motivation and the effect of intrinsic motivation on behavioral intention. Rather than weakening the model, these results reveal important contextual characteristics of digital health adoption among POSYANDU cadres in East Java. The non-significant influence of behavioral norms on extrinsic motivation indicates that social expectations from peers, supervisors, or communities do not automatically translate into perceptions of concrete performance benefits. This contrasts with findings in digital finance and e-commerce, where subjective norms strengthen perceived usefulness (Paydas Turan, 2021; Tikno *et al.*, 2024). In the POSYANDU context, however, the instrumental value of digital tools is recognized mainly through direct experience in improving reporting accuracy, coordination, and service efficiency, rather than through social persuasion. Consistent with Shareef *et al.* (2019) and Alaskar and Alsadi (2023), social influence instead functions primarily as a learning mechanism that reduces uncertainty and enhances perceived ease of use through observation and peer support, especially in settings with uneven digital literacy.

The non-significant effect of intrinsic motivation on behavioral intention also diverges from studies in hedonic or commercial digital platforms, where enjoyment directly strengthens intention (Senyo *et al.*, 2018; Biduski *et al.*, 2020). For POSYANDU cadres, however, intention is driven predominantly by extrinsic considerations—namely whether digital systems improve service effectiveness, reduce administrative burden, and support maternal and child health monitoring (Nikou & Economides, 2019; Wang *et al.*, 2024). Enjoyment facilitates learning and usability perceptions, but does not by itself generate sustained commitment. Overall, these findings suggest that in community-based health services, social norms mainly support cognitive accessibility (ease of use), and intrinsic enjoyment supports system acceptance indirectly, while behavioral intention is formed chiefly

through clear utilitarian benefits. This underscores that the relative roles of social, affective, and functional drivers in TAM–TPB vary according to institutional context, and that in public and volunteer-based health settings, performance and service value outweigh social pressure and hedonic motivation in shaping technology adoption.

### *Implication*

This study provides important theoretical implications by reinforcing and extending the Technology Acceptance Model (TAM) (Davis, 1989) and the Theory of Planned Behavior (TPB) (Ajzen, 1991) in the context of community-based digital health services. The findings confirm the core propositions of both models, particularly the central roles of perceived ease of use, perceived usefulness (as extrinsic motivation), and behavioral intention as key determinants of actual system use among POSYANDU cadres. This supports prior digital health adoption studies which emphasize that technology acceptance in primary healthcare is predominantly driven by utilitarian beliefs and cognitive evaluations of system performance (Dwivedi *et al.*, 2021; Wang *et al.*, 2024).

Theoretically, this study extends existing literature by integrating market orientation as a strategic and institutional variable that shapes digital behavioral norms in community health organizations. In line with Narver and Slater (1990) and Celuch *et al.* (2007), market (or service-user) orientation in the POSYANDU context reflects the collective commitment to meeting mothers' and children's health needs, data accuracy, and service responsiveness. This orientation was found to strengthen digital norms, which in turn enhanced perceived ease of use, consistent with the social learning perspective in technology adoption (Shareef *et al.*, 2019). By positioning market orientation as an antecedent of normative beliefs within the TAM–TPB framework, this study contributes to a more institutional and service-system-oriented understanding of digital health adoption, beyond the individual-centric focus of classical models.

The non-significant effects of behavioral norms on extrinsic motivation and of intrinsic motivation on behavioral intention further provide a contextual refinement of motivation theory (Ryan & Deci, 2000). While prior studies in e-learning and mobile services report strong hedonic and social influences on intention (Biduski *et al.*, 2020; Senyo *et al.*, 2018), the present findings indicate that, for volunteer health workers, perceived enjoyment and social expectations are insufficient to drive commitment unless accompanied by clear functional benefits. This supports the argument of Nikou and Economides (2019) that in task-oriented and public service environments, instrumental value outweighs affective value. Hence, the study demonstrates that the relative salience of motivational dimensions is contingent upon institutional context, task criticality, and resource constraints.

From a practical perspective, the findings offer important implications for health policymakers, district health offices, and primary healthcare managers.

Digital health programs for POSYANDU should prioritize demonstrating tangible benefits, such as improved accuracy of growth monitoring, faster reporting to Puskesmas, better integration with maternal and child health information systems, and reduced administrative burden for cadres. Training programs should therefore go beyond technical instruction and explicitly link system features to service effectiveness and community health outcomes, thereby strengthening perceived usefulness and behavioral intention.

Furthermore, strengthening digital norms within POSYANDU networks can be achieved through peer mentoring, role modeling, and community-of-practice approaches, which enhance perceived ease of use by reducing anxiety and building collective efficacy. Rather than relying solely on top-down mandates, digital transformation in community health services should cultivate shared service-oriented values and learning cultures that frame technology adoption as a collective responsibility for improving public health quality. In this way, the study provides actionable insights for designing more sustainable and context-sensitive digital health interventions at the grassroots level.

#### *Limitation and Future Studies*

The research was conducted only among POSYANDU cadres in East Java using a cross-sectional survey design, which limits the generalizability of the findings to other regions or countries with different cultural settings, health system capacities, and levels of digital infrastructure. The reliance on self-reported data may also introduce common method bias and social desirability effects, particularly in a public service context where respondents may feel normative pressure to express favorable views toward government-supported digital programs. Future studies are therefore encouraged to employ longitudinal and mixed-method approaches to capture changes in perceptions, motivation, and actual technology use over time and to obtain deeper insights into the practical dynamics of digital health adoption. Moreover, although this study integrates TAM, TPB, service orientation, and motivational factors, it does not explicitly include broader institutional and structural conditions such as policy support, leadership commitment, infrastructure quality, inter-organizational coordination, and social capital, which have been shown to play a crucial role in sustaining digital transformation in healthcare systems. Finally, the non-significant effects of behavioral norms and intrinsic motivation indicate that technology adoption mechanisms among volunteer-based community health workers may differ from those in commercial or professional settings. Qualitative or experimental research could further explore the conditions under which social influence and enjoyment become more salient, thereby refining the boundary conditions of TAM and TPB in community-based health service contexts.

## Conclusion

This study provides empirical evidence that the integration of the Technology Acceptance Model (TAM) (Davis, 1989) and the Theory of Planned Behavior (TPB) (Ajzen, 1991), extended with market orientation (Narver & Slater, 1990) and intrinsic and extrinsic motivation (Ryan & Deci, 2000), effectively explains digital technology adoption among POSYANDU cadres in East Java. The research has achieved its primary objective by identifying the key psychological, social, and strategic factors that shape intention and actual use of digital health systems in supporting community-based maternal and child health services.

Of the ten hypothesized relationships, eight were supported, confirming the robustness of the TAM–TPB framework in a primary healthcare context, while two non-significant paths revealed important contextual nuances. The integration of market orientation into the model demonstrates that service-user focus and collective commitment to health outcomes play a critical role in forming digital norms and facilitating perceived ease of use, thereby extending prior work in both information systems and health service management literature (Celuch *et al.*, 2007; Rodrigo *et al.*, 2022; Shareef *et al.*, 2019).

The findings further show that although intrinsic motivation enhances perceived ease of use and usefulness, behavioral intention is ultimately driven more strongly by extrinsic, utilitarian considerations. This underscores the pragmatic orientation of POSYANDU cadres, whose technology adoption decisions are guided primarily by service effectiveness, accountability, and workload efficiency rather than by hedonic enjoyment. Consistent with Ajzen (1991) and Dwivedi *et al.* (2021), behavioral intention remains the strongest predictor of actual system use, but in this context it also reflects broader readiness for digital transformation within community health institutions.

Overall, this study not only validates the applicability of TAM and TPB in the digital health domain but also enriches them by incorporating strategic and motivational dimensions relevant to grassroots healthcare delivery. By revealing how market orientation, motivation, and social norms interact to shape digital adoption among volunteer health workers, the research offers both theoretical advancement and practical guidance for strengthening the sustainability and effectiveness of digital transformation in community-based health services.

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