



## Resistance and acceptance of posyandu cadres to the digitization of stunting recording: qualitative analysis of empowerment-based technology acceptance model (case study in Gegerkalong village, Bandung city)

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### ABSTRACT

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The transformation of maternal and child health data recording from manual methods to digital systems poses significant socio-technical challenges at the grassroots level. This study aims to analyze the dynamics of resistance and acceptance of Posyandu cadres in Gegerkalong Village, Sukasari District, Bandung City towards stunting recording technology, by integrating the Technology Acceptance Model (TAM) and the andragogy approach. Using a qualitative approach with a case study design, data collection was carried out through in-depth interviews, participatory observations, and Focus Group Discussions (FGD) involving 12 participants (senior cadres, young cadres, and health workers). The results of the study show that technological resistance is mainly triggered by the mismatch of interface design (User Interface) with the cognitive and visual capacity of adult learners, which leads to cognitive overload and low Perceived Ease of Use. On the other hand, revenue is driven by the perception of Perceived Usefulness when digital reporting is considered to be able to increase efficiency and raise the social status of cadres in society. This research underlines the importance of integrating the concept of lifelong education and peer tutoring methods in cadre mentoring. It is recommended that the design of future health information systems involve end users (cadres) in the development phase to realize inclusive technology.

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### 1. INTRODUCTION

Optimizing the quality of human resources starts from the early age phase, where stunting prevention is a crucial indicator in the population and national development map (Batubara et al., 2025; Ipa et al., 2023). The Government of Indonesia has made massive interventions, one of which is through the digitization of the nutrition recording and reporting system at the posyandu level using various mobile-based platforms (such as the e-PPGBM application or the Sehat IndonesiaKu/ASIK application) (RI, 2024). This

data integration policy places Posyandu cadres as the spearhead of collecting child anthropometric data (weight, height, head circumference) whose validity greatly determines policy interventions at the central level (Hastuti et al., 2025; Täge & Febriyanti, 2024).

Although the information system infrastructure has been built, its implementation in the field often faces obstacles of human error and user resistance. In Sukasari District, Bandung City, especially in Gegerkalong Village, which has a dense and dynamic demographic of urban communities, Posyandu cadres are required to adapt quickly. The dynamics in Gegerkalong have become very complex because the majority of cadres have a double burden; In addition to serving at Posyandu, they are often also movers in Early Childhood Education (PAUD) and the Toddler Family Development (BKB) program (Maghfiroh & Yulianto, 2025; Suryani & Rahman, 2025). The abrupt transition from manual recording in Maternal and Child Health (KIA) books to real-time reporting via smartphones has triggered administrative fatigue and technophobia, especially among elderly cadres (Herawati & Sunjaya, 2022; Indah & Asnil, 2026). From the disciplines of Computer Science and Informatics, the phenomenon of technology acceptance can be analyzed using the Technology Acceptance Model (TAM) introduced by Davis. TAM postulates that the adoption of information systems is determined by two main beliefs: Perceived Ease of Use and Perceived Usefulness (Priadi et al., 2025). Unfortunately, conventional TAM studies are often biased towards solving software problems (code and server quality) and fail to dissect the User Experience (UX) aspect that is heavily influenced by the sociological and demographic backgrounds of the users (Rahman et al., 2025; Sufri et al., 2024).

The application of TAM in community-based health settings such as Posyandu has several limitations. TAM primarily emphasizes individual cognitive perceptions of technology, namely perceived usefulness and perceived ease of use, while paying less attention to social, cultural, educational, and organizational factors that strongly influence technology adoption in grassroots communities. In the context of Posyandu cadres, acceptance of digital systems is not merely determined by technical considerations but is also shaped by age differences, digital literacy levels, peer support, community norms, learning experiences, and the voluntary nature of cadre work. Consequently, TAM alone may not adequately explain the complexity of technology acceptance among Posyandu cadres, particularly in environments where social interaction, collective learning, and community empowerment play a central role in shaping behavioral change.

This is where the fundamental role of the discipline of Community Education is. Posyandu cadres are actually adult learning citizens who are in the corridor of non-formal education and lifelong learning. Referring to the andragogy theory (Nahak & Nitsae, 2024; Susilawati, 2025), adults have an independent self-concept, an accumulation of experiences that are a source of learning, and a learning orientation that is centered on real problems (problem-centered). Forcing the use of digital applications without proper pedagogic/andragogic strategies will lead to cultural rejection (Organization, 2025; Utami et al., 2024).

Therefore, this study aims to fill the literature gap by crossing the analysis of the usefulness of the interface system (Informatics) with the strategy of empowering adult learners (Community Education). The focus of the problem is directed at identifying forms of resistance and acceptance of cadres in Gegerkalong Village to the digitalization of stunting, as well as the formulation of an effective empowerment model to accelerate the adoption of community-based technology.

## 2. RESEARCH METHOD

This study adopts a qualitative approach with a case study design. This approach was chosen to explore the phenomenon of technology acceptance in depth according to its natural context. The location of the research was determined in Gegerkalong Village, Sukasari District, Bandung City. The determination of the location is based on the characteristics of areas that have basic service activities (Posyandu, Posbindu, and PAUD) that are very active and structurally integrated under the local regional Working Group.

The study participants were drawn using the purposive sampling technique, which consisted of 12 key informants: (a) Five (5) Senior Posyandu Cadres (age >50 years, service period >10 years), (b) Four (4) Young/Beginner Posyandu Cadres (age 25-40 years), (c) One (1) Chairman of the Posyandu Working Group at the village level who is also active in the PAUD institution, (d) Two (2) Health Workers (Village Midwives/Health Center Nutrition Officers).

The selection of 12 informants was based on the principle of information richness and data saturation commonly applied in qualitative case study research. Informants were deliberately chosen to represent the main stakeholder groups involved in the implementation of digital stunting reporting systems, including senior cadres, young cadres, community leaders, and health professionals. This variation enabled the researchers to capture diverse experiences, perceptions, and levels of technology adoption across different age groups, educational backgrounds, and organizational roles. Data collection was continued until thematic saturation was achieved, indicated by the recurrence of similar patterns regarding technology resistance, perceived usefulness, digital literacy challenges, and adaptation strategies, with no substantially new themes emerging from subsequent interviews and discussions.

Data was collected throughout the period February to April 2026 through three techniques: (a) In-depth Interview: Conducted to explore psychological barriers, understanding of application navigation, and perception of the benefits of digital reporting. (b) Participatory Observation: The researcher was present directly during the Posyandu Open Day at the local RW, observing the interaction (User Experience) of cadres with their mobile phones during the entry of weight/height data of toddlers. (c) FGD (Focus Group Discussion): Held at the end of the field research phase to triangulate data and formulate a solution model with participants.

Data analysis uses the interactive model of Miles, Huberman, and Saldaña (2014) which includes data collection, data condensation, data presentation, and conclusion drawn. The process of code categorization (coding) is carried out thematically to separate the technical interface variables and the sociological variables of society.

## 3. RESULTS AND DISCUSSIONS

The research findings are presented in three major themes that represent the process of technology adoption: from initial barriers (resistance), sociological negotiations (acceptance), to proposed interventions based on community education.

### 3.1 Socio-Technical Reality: Interface Complexity and Cognitive Burden of Adult Learning Citizens

The initial implementation of the nutrition recording application in Gegerkalong was met with considerable resistance, particularly among senior cadres. The findings indicate that this resistance was not merely caused by limited digital literacy but was strongly influenced by several interface design factors that reduced usability and increased cognitive burden during data entry activities. Based on observation and

interface analysis (UI/UX), the information architecture in stunting reporting applications often does not consider the demographic conditions of users in the field.

Senior cadres consistently report low levels of Perceived Ease of Use. The main barriers identified include: (1) Too small a typographic size, (2) The use of medical technical terms in English that cadres do not understand, and (3) Data input mechanisms that are prone to errors (fat-finger error).

One of the informants, Senior Cadre A (56 years old), revealed his cognitive load: "Hurry up, Neng. The screen, if touched, likes to run to another menu. The mother's eyes are plus, she is told to enter the decimal number of the child's height using a comma. If you press it wrong, the mother panics afraid that the data of the child in the RW here will be red (stunting) even though it is originally healthy. Finally, my mother just writes in a notebook first, then later in the evening I put my child at home who puts it into the cellphone." (Cadre A interview, March 2026).

Further analysis revealed that resistance was primarily associated with several interface design factors. First, poor readability resulting from small font sizes and low visual contrast made it difficult for older cadres to read instructions and numerical data accurately. Second, the application relied heavily on technical and medical terminology that was unfamiliar to users with limited digital and health informatics literacy. Third, the navigation structure was perceived as overly complex, requiring multiple steps to complete a single reporting task and increasing the likelihood of user confusion. Fourth, the absence of user-friendly error prevention and recovery features, such as automatic validation, warning notifications, and simplified correction options, heightened anxiety when entering anthropometric data. Finally, the application interface was not sufficiently adapted to the needs of older users, particularly regarding touch-target size, menu accessibility, and visual guidance. These interface-related barriers collectively increased cognitive burden and reduced users' confidence in interacting with the digital reporting system.

From the perspective of informatics, the system lacks the error prevention function which is crucial in interface design for the elderly. From the perspective of Community Education, this situation represents a neglect of the principle of readiness to learn (Kurniasari et al., 2026; Lestari, 2025). Adult learners are forced to adopt new tools in the midst of noisy and stressful Posyandu situations (toddlers crying, long queues), which immediately triggers a mental blockade and technophobia (Wulandari et al., 2025).

### 3.2 Revenue Dynamics: Usefulness, Social Status, and Cross-Sector Integration

Although the initial phase was colored by resistance, the study found that Perceived Usefulness was slowly building up. This acceptance process was not driven by an understanding of the IT system, but by a social construction that was very thick with the culture of the communal community in Sukasari.

Young cadres see the digitization of stunting recording as a tool to increase efficiency and transparency. However, for senior cadres, motivation to learn grows due to social influence factors and cross-role integration (Ratnawati & Hardinata, 2025; Siswati et al., 2026). Considering that many cadres in Gegerkalong also concurrently serve as administrators of the PAUD Working Group at the regional level, the accuracy of children's data at the Posyandu has direct implications for the child growth and development detection program in PAUD.

Young Cadre B (32 years old) highlights the functional benefits: "At first, it was complicated because the system liked to go down, but over time we realized, if the data enters the application, we don't need to manually recap it using the KMS graph ruler again at the end of each month. The Village Head and Midwife also immediately knew that day that there was a child whose weight did not rise." (Cadre B interview, April 2026).

The Chairman of the Working Group added a sociological perspective related to social status: "The cadres here have high prestige. If the next RW can use all applications, our RW doesn't want to look gapless. There is a pride in themselves when they wear cadre uniforms, hold cellphones, and can chat digital data with midwives. It raises their rank in the eyes of the citizens." (Interview of the Chairman of the Working Group, April 2026).

This confirms that in the implementation of technology in society, sociological aspects and prestige can transcend technical barriers. The acceptance of technology is realized when cadres feel that their function is appreciated and the technology makes them more authoritative community facilitators (Azzahra et al., 2025; Mustasmara et al., 2026).

### 3.3 Andragogy-Based Empowerment Strategies: Peer Tutoring and Lifelong Education Model

Failure to implement health technology is often rooted in pedagogical errors in training cadres. The classical method in the form of mass counseling in the sub-district hall has proven to be ineffective because it ignores the disparity in digital literacy of cadres. To bridge this, it is necessary to integrate the principles of non-formal education into the digitalization ecosystem (Faza et al., 2022; Huriah, 2025).

Based on the results of the FGD, it was agreed that the most relevant empowerment model to be implemented is the Community-Based Peer Tutoring Model. Young cadres who are more tech-savvy are positioned as local tutors for 2-3 senior cadres in their respective RWs.

This approach is in line with the philosophy of lifelong education, where learning spaces are not limited by formal institutions (Widyansyah & Sapsudin, 2026). Andragogy strategies that are recommended and have begun to be practiced in Gegerkalong include: (a) Problem-based learning: Application training does not use abstract dummy data, but real data of toddlers in their area. (b) Microlearning: Cadres are not taught all the features of the application in one day. The first month specifically focuses on login and attendance input. The second month focuses on weight input. Breaking down this information drastically reduces cognitive overload. (c) Non-Sutratification Learning Climate: Utilizing informal forums such as cadre arisan or monthly evaluation meetings of the Working Group to share tips on overcoming application problems (troubleshooting), so that senior cadres do not feel judged when they make mistakes.

## 4. CONCLUSION

This research proves that digital transformation in recording stunting at the grassroots is not just a problem of technology transfer (Informatics), but a sociological transition process that requires the intervention of Community Education. The resistance of Posyandu cadres in Gegerkalong Village stems from the inability of the system interface to accommodate the physical and cognitive limitations of adult learners. However, technology acceptance can be achieved (Technology Acceptance Model is fulfilled) when cadres realize the usefulness of the system in increasing the effectiveness of cross-sectoral work (Posyandu and PAUD) and raising their social status as agents of change in society. Based on the synthesis of the qualitative findings above, this study proposes concrete recommendations in two domains: Informatics (System Developer): Developers of health applications owned by local/central governments are required to adopt an inclusive User-Centered Design (UCD) framework for the elderly. It requires a high-contrast interface, linear navigation (unbranched), and an intuitive error-prevention feature to prevent errors in nutrition data input for toddlers. The Realm of Community Education (Regional Health Office & Working Group): The approach to technology socialization must shift from the instructional method to the andragogic mentoring

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model. The government needs to officially institute and facilitate the "Peer Tutor Cadre Digital Literacy" program as part of the implementation of lifelong education at the village/sub-district level, so that the independence of mastery of health technology can be sustainable.

Future studies should evaluate the impact of digitalized stunting recording systems on data quality indicators, such as accuracy, completeness, and timeliness, as well as their contribution to the effectiveness of public health interventions and stunting prevention outcomes. Longitudinal and mixed-method approaches are recommended to generate stronger evidence regarding the sustainability and public health benefits of digital transformation at the community level.

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