

Between Technological Determinism and Social Construction: The Adoption of Smartphones in the Samin Community of Sukolilo, Central Java

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Abstract The rapid expansion of digital technologies has intensified debates on whether technological change is primarily driven by technological determinism or shaped through social and cultural processes. While smartphones have become central to digital transformation, existing studies often assume linear and uniform patterns of adoption, overlooking the role of local socio-cultural contexts. This study addresses this gap by examining how smartphones are adopted within the Samin community of Sukolilo, Central Java—an indigenous community characterized by strong moral values and non-formal learning practices. Using a qualitative ethnographic approach, data were collected through observation, interviews, and focus group discussions. The findings show that smartphone adoption is selective, socially regulated, and negotiated through the interaction between technological affordances, socio-cultural values, and everyday practices. The study proposes the Negotiated Smartphone Adoption Model, contributing to ICT4D and technology-society discourse.

Keywords: Smartphone adoption; SCOT; Technological determinism; Indigenous community; ICT4D

I. INTRODUCTION

The rapid proliferation of digital technologies has significantly reshaped contemporary social life, transforming how individuals communicate, access information, and participate in economic and cultural

activities. Among these technologies, the smartphones have emerged as a central infrastructural device, particularly in developing regions where it often serves as the primary gateway to the internet [1], [2]. Its widespread diffusion has been associated with the expanded access to education, communication, networks, and digital economies, including in rural and marginalized communities [3],[4]. In Indonesia, digital transformation has become a key national development agenda, driven by efforts to expand connectivity, improve digital infrastructure, and promote inclusive access to information and communication technologies [5], [6]. However, increasing evidence suggest that technological access does not automatically translate into meaningful social transformation. Rather than producing uniform outcomes, the adoption and use of digital technologies are mediated by social structures, cultural values, and everyday practices [7], [8]. This insight challenges linear assumptions about technology-driven change and calls for a more context-sensitive understanding of how technologies are embedded in specific socio-cultural environments.

Within the field of Information and Communication Technologies for Development (ICT4D), recent scholarship has shifted from access-based perspective toward analysis that emphasize the situated nature of technology adoption. Studies show that digital technologies are not simply implemented according to their intended design but are actively appropriated, adapted, and reinterpreted within local contexts [9], [10]. This perspective highlights that technology use is shaped not only by technical affordances but also by social meanings, cultural norms, and community practices.

This shift closely connected to a longstanding theoretical debate concerning the relationship between technology and social change. The perspective of technological determinism posits that technological innovation acts as the primary driver of societal transformation, shaping patterns of communication, social organization, and cultural life in largely linear and inevitable manner [11], [12]. In contrast, the Social Construction of Technology (SCOT) framework argues that technologies are socially constructed artifacts whose meanings and uses are shaped through processes of negotiation among different social groups [13]. Central to this perspective is the concept of interpretative flexibility on socio-cultural context in which it is embedded.

The tension between these perspectives becomes particularly significant in the context of indigeneous and local communities encountering digital technologies. Empirical studies demonstrate that such communities do not passively adopt technologies but actively engage in processes of selection, adaptation, and reinterpretation [14]. In many cases, technologies are selectively integrated into everyday life, with certain uses encouraged while others are limited in accordance with cultural values and social norms [15]. This suggests that technology adoption is neither purely deterministic nor entirely arbitrary, but instead emerges through ongoing negotiation between technological possibilities and socio-cultural constraints.

The Samin community in Sukolilo, Central Java, provides a compelling empirical setting to explore this dynamic. Known for its strong ethical principles (particularly honesty, simplicity, and social solidarity) the community maintains a distinctive socio-cultural system that emphasizes collective values and non-formal modes of learning [16], [17], [18]. Knowledge transmission occurs through *sinau*, a relational and experiential practice embedded in everyday social interaction [19]. Previous research has shown that communication within *sinau* functions not merely as a medium but as the organizing

infrastructure of learning processes, structuring how knowledge is shared, internalized, and reproduced within the community.

In recent years, the expansion of telecommunication infrastructure has facilitated the entry of smartphone into the Samin community [16], [20]. These devices are increasingly used, especially among younger members, for communication, social media, and digital consumption. However, their adoption is not uniform or unrestricted. Instead, smartphone use is shaped by community norms, moral considerations, and collective practices that regulate when, how, and for what purposes technology is used. This phenomenon raises important questions about whether smartphone adoption in this context reflects a deterministic process of technological change or a socially constructed process shaped by cultural negotiation.

Despite the growing literature on digital transformation and technology adoption, several gaps remain. First, many studies continue to rely on diffusion-based or access oriented frameworks, which often overlook the social-cultural dimensions of technology use [7]. Second, empirical research that explicitly engages with the tension between technological determinism and social construction remains limited, particularly in indigenous contexts. Third, while the Samin community has been widely studied in relation to its cultural values and historical background, its interaction with digital technologies, especially smartphones, has received relatively limited scholarly attention.

Addressing these gaps, this study aims to analyze how smartphones are adopted and interpreted within the everyday life of the Samin community in Sukolilo. Specifically, it examines whether smartphone adoption reflects a deterministic pattern of technological influence or a socially constructed process shaped by cultural values and social practices. Using a qualitative ethnographic approach, this study explores patterns of smartphone use, the meanings attributed to the technology, and the interaction

between digital technologies and the socio-cultural structure of the community.

Building on this analysis, the study proposes a conceptual framework termed the Negotiated Smartphone Adoption Model. This framework conceptualizes smartphone adoption as a dynamic and iterative process involving the interaction between (1) technological affordances, (2) socio-cultural values, and (3) everyday practices. Rather than viewing adoption as a linear process, the model highlights how technology is selectively integrated, adapted, and stabilized through continuous negotiation within the community.

This study contributes to the literature in two main ways. Theoretically, it advances the debate between technological determinism and social construction by providing an empirically grounded analysis from an indigenous community context. Empirically, it offers new insights into how digital technologies are integrated into a community characterized by strong moral traditions and non-formal learning systems. By situating smartphone adoption between these two theoretical perspectives as a socially embedded and culturally mediated process.

II. METHOD

The study employs a qualitative research approach with an ethnographic design, grounded in an interpretivist paradigm. This approach was selected to capture the meanings, practices, and socio-cultural dynamics underlying smartphone adoption within the Samin community of Sukolilo. Ethnography is particularly appropriate for examining how technologies are embedded in everyday life, as it enables an in-depth understanding of social practices, cultural values, and lived experiences [21].

The study was conducted in the Samin community in Sukolilo, Pati Regency, Central Java, Indonesia, an indigenous community characterized by strong values and non-formal learning systems. The research design followed a focused ethnographic approach, allowing intensive data collection within a

specific cultural setting over a defined period. Participants were selected using purposive sampling, focusing on individuals directly involved in everyday practices and technology use within the community. The participants consisted of: community elders (sepepuh), parents, and youth. This selection ensured representation of integrational perspectives, which is essential for understanding negotiated technology adoption.

Data were collected using multiple qualitative techniques to ensure depth and triangulation: 1) Participant Observation, 2) In-depth Interviews, 3) Focus Group Discussion. Data were analyzed using thematic analysis, following the framework proposed by Braun and Clarke (2006) [22]. The analysis proceeded through three main stages: open coding, axial coding, and selective coding. To enhance analytical rigor, coding and data management were supported by qualitative analysis software Nvivo, enabling systematic organization and traceability of data. To ensure the specific validity of the findings, this study applied criteria of trustworthiness as proposed by Lincoln and Denzin (2011) [23]: Credibility, Transferability, Dependability, and Confirmability. Ethical principles were strictly followed throughout the research process. Participants were informed about the purpose of the study, and informed consent was obtained prior to data collection. Anonymity and confidentiality were maintained by using pseudonyms and removing identifiable information. The research respected local cultural norms and values, particularly in engaging with community elders and conducting observations in communal settings.

III. RESULT AND DISCUSSION

The Nvivo-based coding analysis reveals that smartphone adoption in the Samin community is structured around three interconnected dimensions: 1) Technological affordances which enable communication, access to information, and economic coordination, 2) Socio-cultural values which

regulating acceptable use through moral norms and collective expectations, 3) Everyday practices which mediating how technology is actually used in daily life. These dimensions converge into four overarching themes: functional use of technology, informal digital leaning, selective learning, and intergenerational negotiation. Together, these themes form the empirical basis for the Negotiated Smartphone Adoption Model, demonstrating that smartphone adoption is nor linear but iterative, selective, and culturally mediated.

Tabel 1. Nvivo-based Thematic Coding of Smartphone Adoption in the Samin Community

Open Coding (Initial Codes)	Verbatim Data (Empirical Evidence)	Axial Coding (Category)	Selective Coding (Core Theme)
Communication facilitation	"HP... ngeringanke komunikasi... karo sedulur sing adoh"	Technological affordances	Functional use of technology
Agricultural coordination	"Golek bakul pari... dikontak lewat HP"	Technological affordances	Functional use of technology
Access to information	"Saget golek sejarah... saking internet"	Technological affordances	Informal digital learning
Learning through digital media	"Sinaw resep... ndelok YouTube"	Everyday practices	Informal digital learning
Youth digital skills	"Latihan nggawe video... ngodit"	Everyday practices	Generational differentiation
Intergenerational assistance	"Sing bantu anak lan mantu"	Everyday practices	Negotiated use within family
Limited application use	"Mung nggunakake WA... liyane ora"	Socio-cultural values	Selective adoption
Moral filtering of content	"Sing ora perlu ora usah ditiru"	Socio-cultural values	Cultural regulation
Time discipline in usage	"Wayah garap yo garap... wayah ngaso yo ngaso"	Socio-cultural values	Contextual control of use
Risk awareness (negative impact)	"HP... bisa nggawe lali wektu... mripat lara"	Socio-cultural values	Controlled engagement
Misinformation awareness	"Akeh informasi ora bener... kudu waspada"	Socio-cultural values	Digital caution
Social media risk	"Ati-ati kenean saka medsos"	Socio-cultural values	Social regulation
Continued parental guidance	"Wong tua ki ora bosen ngingelke"	Everyday practices	Intergenerational negotiation
Coexistence with sinaw	"Sinaw tetep saka praktik... ora saka HP wae"	Everyday practices	Preservation of local learning system
Technology as neutral tool	"Digawe apik ya isa, digawe elek ya isa"	Socio-cultural values	Interpretative flexibility

This analytical process is illustrated in Figure 1:

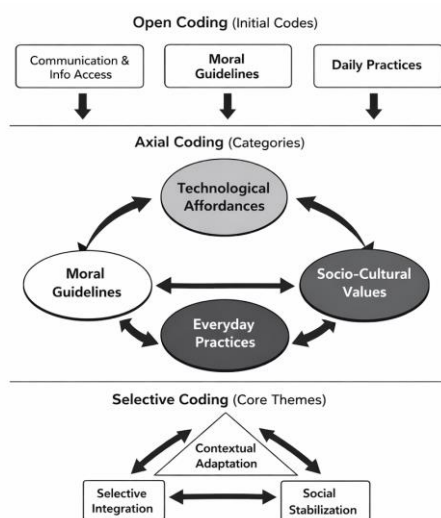


Figure 1. Nvivo-based Thematic Coding Structure.

The figure illustrates the Nvivo-based thematic coding structure used to analyze

smartphone adoption within the Samin community. It represents a systematic progression from empirical data to conceptual abstraction through three interconnected analytical stages: open coding, axial coding, and selective coding.

A. Patterns of Smartphone Use: From Communication to Contextual Utility

The findings reveal that smartphone adoption within the Samin community is primarily driven by pragmatic and relational needs, rather than by technological enthusiasm. Across interviews and observations, smartphones are consistently understood as tools for communication, coordination, and practical problem-solving, rather than as devices for continuous digital engagement. For instance, an elder informant emphasized that smartphones are mainly used to maintain social ties across geographical distance:

"HP tugase kanggo komunikaso...sambung kabar karo sedulur sing beda desa..."

Similarly, parents reported that smartphones facilitate economic activities such as selling agricultural products through platforms like WhatsApp and Facebook, demonstrating their role in supporting localized digital economies:

"Kanggo dodolan...lewat Facebook, WA...luwih gampang..."

These findings align with ICT4D literature suggesting that digital technologies in rural contexts are often adopted to fulfil existing social and economic function, rather than to transform them [24]. In this sense, smartphone adoption in the Samin community reflects functional domestication, where technology is incorporated into daily life according to practical needs. However, beyond communication, smartphones are also use as tools for informing learning, particularly among younger users. Participants reported using Google, YouTube, and other applications to access knowledge related to agriculture, health, and daily problem-solving:

"Nak mboten ngertos...tanglet ting Google..."

This suggest that smartphones contribute to expanding access to knowledge, yet their use remains situational and need-based, rather than continuous or immersive.

B. Selective Adoption and Social Regulation of Technology

A key finding of this study is that smartphone use within the Samin community is not freely practiced, but instead governed by strong social norms and cultural regulation mechanisms. Observational data show that individuals often carry smartphones but deliberately refrain from using them during communal activities such as *sinau* or social gatherings:

- Youth bring smartphones but do not use them during learning sessions.
- Parents avoid using smartphones during communal meetings
- Technology use is contextually restricted.

This indicates the presence of collective control over technology use, where appropriate behavior is shaped by shared cultural expectations. As one informant stated:

“Mboten wonten sesuatu sing lepas dari komunikasi”

Importantly, communication here functions not only as interaction but as mechanism of social regulation, reinforcing norms regarding when and how technology should be used.

From a theoretical perspective, this finding strongly supports the Social Construction of Technology (SCOT) framework. The meaning and use of smartphones are not determined by the technology itself but are actively shaped by the community through normative negotiation. The observed restriction of smartphone use during *sinau* demonstrates that cultural values override technological affordances, contradicting deterministic assumptions.

C. Dual Perception of Technology: Benefit and Risk

Another significant finding is the ambivalent perception of smartphones within the community. Informants consistently

described smartphones as both beneficial and potentially harmful:

“HP niku...alat komunikasi...nanging ugi senjata sing saged natoni awake dhewe”

This dual perception reflects a critical awareness of both the opportunities and risks associated with digital technology. On the one hand, smartphones enable communication, access to knowledge, and economic activities. On the other hand, they are perceived as sources of distraction, moral risk, and potential disruption to social harmony.

FGD data further highlight concerns regarding: excessive screen time, exposure to inappropriate content, misinformation and digital fraud, behavioral changes among youth. This aligns with recent studies on digital adoption in rural contexts, which emphasize that communities often develop selective engagement strategies to balance technological benefits with socio-cultural risks.

a. Intergenerational Differences and Negotiated Use

The findings also reveal clear intergenerational differences in smartphone adoption. Younger users tend to be more technologically fluent and explore broader digital functionalities, including social media, entertainment, and content creation:

“Latihan damel video... nyekel kamera, ngedit...”

In contrast, older generations tend to use smartphones in a limited and utilitarian manner, often relying on younger family members for technical assistance:

“Sing bantu nggeh anak lan mantu...”

Despite these differences, technology use is not left unregulated. Parents actively guide and monitor their children's use of smartphones, emphasizing moral boundaries:

“HP kui dudu sosok sing iso ngrampungu masalah...”

This reflects a process of intergenerational negotiation, where technological adoption is mediated through family-based communication and moral guidance. Rather than creating generational

conflict, smartphones become part of a shared negotiation process within the household and community.

b. Integrating the Model: Negotiated Smartphone Adoption

The empirical findings can be synthesized through the **Negotiated Smartphone Adoption Model**, which conceptualizes smartphone adoption as a dynamic interaction between three dimensions:

- Technological affordances: communication, information access, digital economy
- Socio-cultural values: honesty, simplicity, social harmony
- Everyday practices: farming, communal learning (*sinau*), family interaction

The relationship among these dimensions is not linear but iterative and negotiated, as illustrated in the conceptual model.

Smartphone are not fully accepted nor rejected; instead, they undergo three key processes: 1) Selective Integration, only certain functions (communication, learning, economic use) are widely accepted, 2) Contextual Adaptation, usage is adjusted to fit social norms, such as restricting use during *sinau*, 3) Social Stabilization: Over time, patterns of acceptable use become normalized within the community. This process reflects domestication theory, where technology is embedded into daily life through gradual adaptation rather than immediate transformation.

c. Theoretical Implications: Beyond Determinism vs SCOT

The findings demonstrate that smartphone adoption in the Samin community cannot be fully explained by either technological determinism or social construction alone.

- Against determinism: technology does not automatically reshape social practices.
- Beyond pure SCOT: adoption is not only meaning-making, but also structured by moral systems

Instead, the study shows that technology adoption is best understood as a negotiated

process, where: technology offers possibilities, culture sets boundaries, and practice mediates outcomes. This contributes to ICT4D literature by proposing a middle-ground framework, where digital transformation is understood as culturally mediated adaptation rather than technological imposition.

d. Empirical Contribution

Empirically, this study provides new insights into how:

- Indigenous communities selectively adopt digital technologies
- Moral values function as regulatory systems for technology use
- Non-formal learning systems (*sinau*) coexist with digital knowledge sources

Unlike many ICT4D studies that focus on access and infrastructure, this research highlights the importance of cultural negotiation in shaping technology adoption outcomes.

Overall, the findings demonstrate that smartphone adoption in the Samin community is neither a process of passive acceptance nor technological imposition. Instead, it is a socially embedded, culturally negotiated, and continuously evolving process, in which technology is integrated into everyday life without displacing the foundational values of the community.

IV. CONCLUSION

This study examined whether smartphone adoption in the Samin community of Sukolilo reflects a pattern of technological determinism or a socially constructed process. The findings show that adoption is not deterministic but emerges as a contextual, selective, and socially negotiated process, shaped by the interaction between technological affordances, socio-cultural values, and everyday practices. Smartphones are primarily used for functional purposes, such as communication and coordination, while their use is regulated through community norms and intergenerational guidance, resulting in selective integration

and contextual use. The study identifies three key processes, selective integration, contextual adaptation, and social stabilization, captured in the Negotiated Smartphone Adoption Model, which reframes adoption as an iterative negotiation between possibility and constraint. Theoretically, this study bridges technological determinism and SCOT by proposing a relational understanding of technology adoption. Empirically, it shows that digital technologies can be integrated without disrupting local systems such as *sinau*. Future research should test this model across contexts and examine emerging technologies in similar communities.

ACKNOWLEDGMENT

The author gratefully acknowledges the support of Universitas Kristen Satya Wacana in facilitating this research. This article forms part of a doctoral dissertation entitled “*Preservation of Samin Suro Sentiko Teachings and Technological Adaptation in the Era of Digital Transformation: A Study of the Educational Model of the Samin Community in Sukolilo.*”

The author would like to express sincere gratitude to the doctoral supervisors for their invaluable guidance, insightful feedback, and continuous support throughout the research process. Their academic mentorship has been fundamental in shaping the theoretical and methodological direction of this study.

The author is especially indebted to the Samin community in Sukolilo, Pati, Central Java, for their openness, trust, and willingness to share their lived experiences. Their participation has been essential to the completion of this research.

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