

MOBILE APPLICATIONS FOR PROMOTING AWARENESS OF CULTURAL HERITAGE AMONG RURAL COMMUNITIES: FEASIBILITY STUDY

Syifaun Nafisah¹
Nazrul Effendy²

¹Department of Library Science, Faculty of Adab and Cultural Science, Sunan Kalijaga State Islamic University of Yogyakarta, Indonesia.

² Intelligent and Embedded System Research Group, Department of Nuclear Engineering and Engineering Physics, Faculty of Engineering, Universitas Gadjah Mada, Yogyakarta, Indonesia.

1578122G2008012017@uin-suka.ac.id

Abstract

Rural communities in Indonesia are rich in intangible cultural heritage, including oral traditions, local languages, and indigenous knowledge. However, the transmission of this heritage to younger generations is increasingly threatened by modernisation, migration, and limited access to preservation tools. Mobile applications offer a promising avenue for bridging this gap by providing accessible, interactive platforms for cultural engagement. This study explores the potential of mobile applications to enhance cultural heritage awareness among rural communities in Indonesia. Specifically, it aims to identify key features and design elements that foster user engagement with cultural content. A qualitative exploratory design involved semi-structured interviews, app walkthroughs, and field observations in a rural Indonesian village. Thematic analysis was used to interpret the data and uncover patterns related to user experience and cultural interaction. Three major themes emerged: (1) cultural relevance and identity connection, where users felt pride and emotional resonance with culturally tailored content; (2) accessibility and digital literacy, highlighting generational divides and the importance of intuitive design; and (3) intergenerational engagement through interactive features, which fostered shared learning and strengthened family bonds. Mobile applications can serve as practical tools for cultural preservation when they are culturally responsive, accessible, and designed to support intergenerational interaction. The study contributes to the growing discourse on digital heritage and offers practical insights for designing mobile technologies that empower rural communities to sustain and celebrate their cultural identities.

Keywords: Cultural Heritage, Mobile Applications, Rural Communities, Digital Literacy, Intergenerational Engagement, Indonesia

INTRODUCTION

Preserving cultural heritage has become an urgent priority, particularly in rural communities where traditions, languages, rituals, and historical knowledge are often transmitted orally across generations. (Prajnawrdhi et al., 2015). These intangible cultural assets are highly vulnerable to erosion due to modernisation, migration, generational shifts, and the lack of systematic documentation. (Aktürk & Lerski, 2021, 2021; Sepe, 2023). In Indonesia—a country renowned for its cultural diversity—rural

communities are custodians of rich, localised heritage at risk of being lost without timely intervention. (Matusiak et al., 2017).

Despite these communities' cultural wealth, many face significant challenges in preserving and transmitting their heritage. Limited access to formal documentation tools, inadequate infrastructure, and a lack of intergenerational engagement contribute to the gradual fading of traditional knowledge. (Abiodun et al., 201G; Dang & Pheng, 2014; Ellcessor, 201G; Liaqat et al., 2021; Schwenkel, 2015). Moreover, increasingly immersed in digital environments, younger generations often become disconnected from their cultural roots. (Helsper, 2021).

The widespread adoption of mobile technology presents a promising opportunity to address this gap. With their portability, interactivity, and multimedia capabilities, mobile applications offer innovative cultural preservation and education platforms. They can facilitate the documentation of oral histories, traditional practices, and local languages, making cultural content more accessible and engaging for younger users. In rural contexts, where conventional preservation methods may be impractical or under-resourced, mobile apps can serve as scalable, community-driven tools for safeguarding heritage. (B, 2017; Burden & Kearney, 201G).

This study explores the potential of mobile applications to enhance cultural heritage awareness among rural communities in Indonesia. Specifically, it aims to identify key features and design elements that foster user engagement with artistic content. By focusing on the intersection of technology, culture, and community, this research contributes to the growing discourse on digital heritage. It offers practical insights for designing culturally responsive mobile applications that empower rural populations to preserve and celebrate their identities.

LITERARY REVIEWS

The preservation of cultural heritage has long been a central concern in anthropology, cultural studies, and information science. (Bennett, 2015; Eller, 2020; Nanda & Warms, 2015). Scholars emphasise that intangible cultural heritage—such as oral traditions, folklore, rituals, and indigenous knowledge—is particularly vulnerable to loss, especially in rural areas where documentation and institutional support are

limited. (Eichler, 2020). In the Indonesian context, rural communities are rich in cultural diversity but often lack the technological and infrastructural means to safeguard their heritage. (Idris et al., 201G; Saputra, 2024).

1. Cultural Heritage and the Digital Turn

Integrating digital technologies into heritage preservation has opened new avenues for documentation, dissemination, and engagement. (Lukita et al., 2024; Siliutina et al., 2024). Scholars argue that digital tools preserve cultural content and transform how communities interact with their heritage. (Economou, 2015; Giglito et al., 2015). Digital heritage platforms, including websites, virtual museums, and mobile applications, have been shown to enhance accessibility and foster participatory preservation models. (Liew et al., 2022).

2. Mobile applications have emerged as powerful tools for cultural engagement due to their ubiquity, portability, and multimedia capabilities. Some research highlights how mobile apps can support storytelling, language revitalisation, and the transmission of traditional knowledge. (Ajani et al., 2024; Barrett & Cocq, 2015). In rural settings, mobile apps offer a cost-effective and scalable solution for communities with limited access to formal cultural institutions. (Borda & Bowen, 2015; Tsipi et al., 2023).

Several studies have explored the use of mobile apps for cultural education. Some researchers developed a mobile app to teach traditional music and found increased user engagement among youth. (Azman & Kamaruzaman, 201G; Ouyang, 2023). Similarly, projects in indigenous communities in Canada and Australia have used mobile platforms to document oral histories and endangered languages, with positive outcomes in intergenerational knowledge transfer. (Carew et al., 2015; Meighan, 2021).

3. User Engagement and Design Considerations

Effective cultural heritage apps must balance technological functionality with cultural sensitivity. Research suggests that user-centred design, localisation, and community involvement are critical to ensuring relevance and sustainability. (Acharya, 2018; Deconcini, 2024). Features such as gamification, augmented reality, and

interactive storytelling have enhanced user engagement, particularly among younger audiences. (Tan & Ng, 2024; Vera & Sánchez, 201G).

While the potential of mobile applications for cultural preservation is well-documented, there remains a lack of empirical research focusing on rural communities. (Maphosa, 2025). Most existing studies are concentrated in urban or institutional contexts, leaving a gap in understanding how mobile apps function in low-resource, community-driven environments. (Hui et al., 2018). Furthermore, few studies examine user perceptions and the socio-cultural impact of these technologies on heritage awareness and identity formation. (Chan et al., 2025).

This literature review highlights the growing role of mobile applications in cultural heritage preservation and the importance of user-centred, culturally responsive design. However, it also identifies a critical research gap in the context of rural Indonesian communities. Addressing this gap, the present study investigates how mobile applications can enhance cultural heritage awareness in rural settings, focusing on user engagement, knowledge dissemination, and community perceptions.

Theoretical Frameworks

This study is grounded in interdisciplinary theories that intersect cultural preservation, technology adoption, and user engagement. The theoretical framework integrates concepts from cultural heritage theory, the Technology Acceptance Model (TAM), and participatory design to explain how mobile applications can support cultural awareness in rural communities.

1. Cultural Heritage Theory

Cultural heritage encompasses tangible and intangible elements, including traditions, languages, rituals, and oral histories, defining a community's identity. (Damsholt et al., 2022). Intangible cultural heritage is particularly vulnerable in rural areas due to limited documentation, generational shifts, and modernisation pressures. (K, 2024). The preservation of such heritage requires not only safeguarding practices but also active transmission and engagement, especially among younger generations.

This study adopts the view that cultural heritage is a dynamic process that

must be continuously reinterpreted and shared. (Fouseki, 2022). When designed appropriately, mobile applications can serve as digital vessels for this transmission, supporting storytelling, language preservation, and cultural education in accessible formats. (Rahaman, 2018).

2. Technology Acceptance Model (TAM)

This study draws on the Technology Acceptance Model to understand how rural users engage with mobile applications for cultural purposes. TAM posits that two key factors influence user acceptance of technology (Leso & Cortimiglia, 2022; Marangunić & Granić, 2015).

a. Perceived Usefulness (PU)

The degree to which a person believes using a particular system will enhance their performance or experience.

b. Perceived Ease of Use (PEOU)

The degree to which a person believes using the system will be effort-free.

In the context of cultural heritage apps, PU may relate to how effectively the app helps users learn about or preserve their culture. At the same time, PEOU reflects the app's accessibility, interface design, and language options. These perceptions influence users' attitudes toward and intention to use the app regularly.

3. Participatory and User-Centred Design

Practical cultural heritage applications must be designed with the community in mind. Participatory design theory emphasises the involvement of end users—especially those from marginalised or underrepresented groups—in the design and development process. (Bødker et al., 2022; Hansen et al., 2020; van der Velden & Mörtberg, 2015). This means engaging elders, youth, and local leaders in rural cultural contexts to ensure the app reflects authentic cultural values and practices. User-centred design supports this approach by focusing on usability, relevance, and emotional resonance. Features such as storytelling, gamification, and multimedia content can enhance engagement and foster a sense of ownership over cultural knowledge. (zaheer, 2023).

This study builds a comprehensive framework to examine how mobile applications can promote cultural awareness in rural communities by integrating cultural heritage theory, TAM, and participatory design. The framework guides the investigation of:

- a. How users perceive the usefulness and usability of cultural heritage apps.
- b. What design features enhance engagement and knowledge retention?
- c. How digital tools can support the intergenerational transmission of cultural identity.

This theoretical foundation informs the research design and provides a lens for interpreting user experiences and evaluating the broader impact of mobile technology on cultural sustainability

RESEARCH METHOD

To explore how mobile applications can enhance cultural heritage awareness among rural communities in Indonesia, this study adopts a qualitative approach grounded in user experience and cultural context. Given the exploratory nature of the research and the limited prior studies in this domain, a qualitative design allows for a deeper understanding of user perceptions, engagement patterns, and the cultural relevance of mobile app features. The following section outlines the research design, data collection methods, participant selection, and analytical procedures used to investigate the role of mobile applications in promoting cultural heritage awareness.

1. Research Design

This study employed a qualitative exploratory research design to investigate how mobile applications can enhance cultural heritage awareness among rural communities in Indonesia. Given the limited prior research in this area, a qualitative approach was chosen to gain in-depth insights into user experiences, perceptions, and contextual factors influencing engagement with cultural content through mobile platforms.

2. Research Site and Participants

The study was conducted in a rural community in [insert village or region], Indonesia, known for its rich cultural traditions and limited access to formal heritage preservation infrastructure. Participants were selected using purposive sampling to ensure relevance to the research objectives. The sample included:

- a. Local community members
- b. Cultural practitioners
- c. App developers or facilitators involved in cultural heritage projects

3. Data Collection Methods

Data were collected through the following methods:

a. Semi-Structured Interviews

Conducted with community members and cultural stakeholders to explore their experiences, expectations, and perceptions of mobile apps related to cultural heritage.

b. App Walkthroughs

Participants were asked to interact with a selected mobile application (an existing cultural heritage app or a prototype) while researchers observed and recorded their responses.

c. Observations

Contextual observations were made during community interactions to capture non-verbal cues, environmental factors, and cultural nuances. All interviews were audio-recorded (with consent) and transcribed for analysis.

4. Data Analysis

This study adopted a six-phase thematic analysis framework outlined by Ahmed et al. (2025) to interpret qualitative data from interviews, mobile application walkthroughs, and field observations. The process was iterative and reflexive, allowing patterns to emerge organically and ensuring that findings were grounded in participants' lived experiences and cultural contexts. (Ahmed et al., 2025).

a. Data Condensation

The initial phase involved a thorough immersion in the raw data. All interviews were transcribed verbatim, and the researcher engaged in multiple readings of the transcripts, field notes, and observational memos. This deep engagement enabled the identification of striking ideas, emotional nuances, and recurring patterns. Preliminary notes were taken to highlight important cultural references and potential codes. This phase ensured the researcher understood participant perspectives intimately before formal coding began.

b. Coding

The researcher systematically identified and labelled significant data segments using a spreadsheet-based manual coding system with colour-coded highlights. Descriptive codes were assigned to excerpts that conveyed key ideas. Each code was closely tied to the participant's language to preserve the authenticity of meaning and intention. This process broke the data into manageable units while maintaining contextual integrity.

c. Identifying Themes

After generating codes, the researcher grouped related codes into broader conceptual categories and clustered them under a potential theme of Cultural Relevance. Visual mapping techniques explored relationships between codes and identified patterns that aligned with the research questions. This marked the beginning of the shift from descriptive categorisation to interpretive thematic development.

d. Reviewing and Refining Themes

Preliminary themes were then reviewed for internal consistency and clarity. All coded data within each theme were re-examined to ensure coherence, and themes were compared across the dataset to verify their accuracy and representativeness. Redundant or weak themes were

removed, overlapping themes were merged, and where necessary, sub-themes were introduced. This iterative review ensured the final thematic structure was data-driven and analytically robust.

e. Defining Themes

Each theme was clearly defined and appropriately named after refinement to capture its essence. Detailed descriptions were written to explain what each theme represented and its significance. The boundaries of each theme were articulated, and carefully selected participant quotes were incorporated to exemplify key insights. The final themes were:

- 1) Cultural Relevance and Identity Connection
- 2) Accessibility and Digital Literacy
- 3) Intergenerational Engagement through Interactive Features

These themes encapsulated the multifaceted ways mobile applications mediate cultural heritage awareness in rural contexts.

f. Analysis

The identified themes were synthesised in the final phase into a coherent analytical narrative aligned with the study's objectives. The findings section was structured according to the themes finalised, with participant quotes woven throughout to substantiate interpretations. The analysis was further contextualised within relevant theoretical frameworks, including the Technology Acceptance Model (TAM), cultural heritage theory, and participatory design principles. This synthesis transformed raw qualitative data into a scholarly contribution, offering insights into how mobile technologies intersect with culture, design, and intergenerational engagement in low-resource, culturally rich environments.

5. Validity Test

To ensure credibility and trustworthiness, the study employed triangulation across data sources and member checking with participants to validate interpretations.

Ethical approval was obtained from [insert institution], and informed consent was secured from all participants. Anonymity and confidentiality were maintained throughout the research process.

RESULTS AND DISCUSSION

This study investigated how mobile applications can enhance cultural heritage awareness among rural communities in Indonesia. Three major themes emerged by conducting thematic analysis of interviews, app walkthroughs, and field observations: cultural relevance and identity connection, accessibility and digital literacy, and intergenerational engagement through interactive features. These themes provide a user-centred understanding of digital tools' role in cultural preservation and knowledge transmission. The discussion is organised according to the three core research questions

1. Users' Perceptions of Usefulness and Usability

a. Cultural Relevance and Identity Connection

Participants viewed cultural heritage apps as meaningful tools for accessing and preserving traditional knowledge. When applications incorporated local stories, languages, and visual symbols, users—especially elders—experienced a sense of pride and cultural validation. This emotional resonance strengthened user engagement and aligned with prior research emphasising cultural authenticity in digital heritage platforms (Li et al., 2025), and the theoretical framework referred to by experts (Chhabra, 2021; Li et al., 2025; Muenstermann, 2025; Silverman, 2015). Rather than serving as generic content repositories, effective mobile heritage apps must be co-designed with local communities to ensure cultural specificity. This participatory approach transforms mobile apps from passive consumption tools into mechanisms of cultural empowerment.

b. Usability Challenges and the Digital Literacy Divide

Despite cultural relevance, usability perceptions varied across age groups. Younger users reported ease of navigation, while older users struggled with the unfamiliar interface and expressed anxiety over potential errors. These findings underscore the digital literacy gap in rural populations, consistent

with previous research. (Arion et al., 2024; Chetty et al., 2018; Reddy et al., 2020, 2023; Singh et al., 2024). Intergenerational collaboration emerged organically, as digitally literate youth assisted older family members using the apps. This highlights the importance of designing inclusive features such as icon-based interfaces, offline accessibility, and local language support, as well as implementing community-based digital onboarding programs to bridge usability gaps. (Anuyah et al., 2023; Southard et al., 2024). These patterns support the Technology Acceptance Model (TAM): perceived usefulness was enhanced by cultural relevance, and perceived ease of use was influenced by interface design and user support structures. (Bhattacharya et al., 2024).

2. Accessibility and Digital Literacy

a. Design Features

The study identified key design features that significantly enhanced engagement and retention of cultural knowledge:

- 1) Multimedia storytelling
- 2) Gamified features
- 3) Local symbolism, including traditional attire, colours, and motifs, created a familiar and respectful user experience.
- 4) Narrative personalisation enhances emotional investment, allowing users to contribute family stories.

These features appealed to multiple learning styles—auditory, visual, and kinesthetic—and supported memory retention by embedding cultural knowledge in interactive and emotionally resonant forms. (Dushyanthen et al., 2025).

b. Digital Tools

One of the most compelling findings was the role of mobile apps in fostering intergenerational dialogue. Interactive elements—such as audio stories and quizzes—naturally became shared experiences between children and elders. These collaborative moments opened up conversations about local customs,

family histories, and traditional values, many of which might not have occurred otherwise. This dynamic reveals the potential of mobile applications to act as social technologies—not only distributing content but also reinforcing family bonds and revitalising oral traditions in modern formats. Elders, who were initially hesitant, expressed satisfaction in seeing their knowledge appreciated and carried forward by younger generations.

3. Interconnectedness of Culture, Design, and Community

The study's conceptual framework highlights the interdependence of the three thematic elements:

- a. Cultural relevance fosters identity, connection, and emotional engagement.
- b. Accessible design enables inclusive participation across age and literacy levels.
- c. Intergenerational interaction enhances both knowledge transmission and community cohesion.

Together, these elements form a holistic model for designing culturally sustainable digital heritage tools. The implications extend beyond application design: developers, educators, and cultural institutions must engage with local contexts, user capabilities, and socio-cultural dynamics to create meaningful digital interventions. Table 1 provides a summary of the main themes and descriptive findings, while Figure 1 presents a visual representation of the thematic relationships identified in the study..

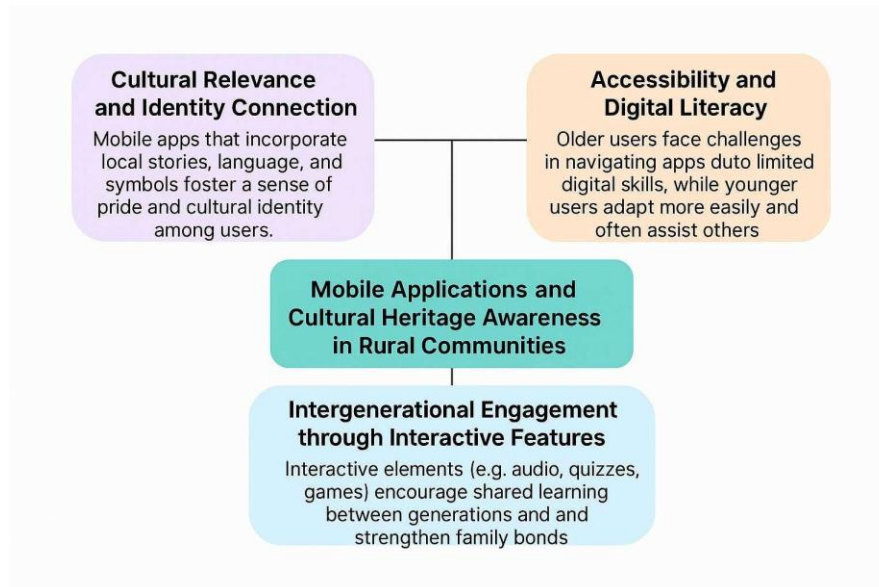


Fig 1. The thematic relationships

Table 1. The main themes and descriptive findings

Theme	Descriptive Findings
Cultural Relevance and Identity Connection	Field data revealed that participants felt a strong emotional connection when mobile applications reflected their local culture. Apps that included traditional stories, regional languages, and familiar symbols were perceived as more meaningful. Elders expressed pride in seeing their heritage represented digitally and viewed the app as a tool to pass on cultural knowledge to younger generations. This emotional resonance enhanced user engagement and reinforced cultural identity.
Accessibility and Digital Literacy	While mobile apps were generally accessible, digital literacy emerged as a significant barrier, particularly among older users. Many participants expressed hesitation or fear of using unfamiliar technology, citing concerns about making mistakes or damaging the device. In contrast, younger users—especially school-aged children—easily navigated the apps and often assisted older family members. The findings suggest that simple interfaces, offline functionality, and visual cues are essential for improving usability in rural settings.

Intergenerational Engagement through Interactive Features	Interactive features such as audio storytelling, quizzes, and games were highly effective in fostering engagement across age groups. These elements encouraged collaborative use between children and elders, creating opportunities for intergenerational dialogue. Participants
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CONCLUSIONS

This study explored the role of mobile applications in enhancing cultural heritage awareness among rural communities in Indonesia. Three key themes were identified through thematic analysis of interviews, app walkthroughs, and field observations: Cultural Relevance and Identity Connection, Accessibility and Digital Literacy, and Intergenerational Engagement through Interactive Features.

The findings highlight that when designed with cultural sensitivity and local participation, mobile apps can foster emotional connections, reinforce cultural identity, and serve as modern tools for transmitting traditional knowledge. However, digital literacy remains a significant barrier, particularly for older users, emphasising the need for inclusive design and community-based onboarding efforts. Interactive features such as storytelling and games increased engagement and encouraged intergenerational dialogue, making digital tools effective mediums for preserving intangible cultural heritage.

Overall, this study underscores the importance of designing mobile heritage applications that are both technologically functional and socially and culturally responsive. Future research should consider testing prototype applications in rural settings and incorporating quantitative methods to assess broader impacts and scalability.

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