

Visitors' Perceptions of iKelirieng for Digital Interpretation of Kelirieng Heritage: A Descriptive Study

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Abstract:

Kelirieng, a traditional burial monument associated with Indigenous communities in Sarawak, holds historical, cultural and symbolic significance. Although physical displays present tangible heritage objects, supplementary interpretation may be needed to communicate detailed historical, cultural and symbolic information. This study evaluates iKelirieng, a digital heritage interpretation platform developed for Kelirieng heritage at Muzium Negara, Kuala Lumpur. The platform integrates QR-code access, mobile augmented reality (AR), digital storytelling and interactive quizzes. A quantitative, cross-sectional survey was conducted with 122 purposively selected respondents who had used iKelirieng. Data was collected through an online questionnaire and summarised using frequencies and percentages. The questionnaire covered self-reported digital readiness, perceived usefulness, perceived ease of use and attitudes towards using the platform. Responses were predominantly positive across the reported items, suggesting that participants generally viewed iKelirieng as accessible and potentially useful for museum-based heritage interpretation. These findings provide preliminary evidence of favourable user perceptions; they do not demonstrate improved learning outcomes, increased heritage knowledge or actual future use. The study offers an initial user evaluation of a digital approach to interpreting Kelirieng heritage and identifies priorities for further development and evaluation.

Keywords — iKelirieng, digital heritage, augmented reality, heritage interpretation, user perceptions, technology acceptance

I. INTRODUCTION

Indigenous cultural heritage contributes to collective identity, historical knowledge and cultural practice. In Sarawak, Kelirieng is a traditional burial monument associated with Indigenous communities, including the Sekapan and Punan Bah and reflects the cultural beliefs, carving traditions and local knowledge associated with these communities [1]. Interpreting this heritage involves more than presenting an object's physical appearance; visitors also need accessible explanations of its historical context, motifs, structure and cultural significance. Museums therefore face the challenge of communicating complex cultural knowledge in ways that are informative while remaining respectful of the communities to whom that knowledge belongs.

Digital technologies can complement object-based displays by providing layered information and interactive forms of interpretation. Augmented reality (AR) can connect digital content with physical objects or locations, while mobile access and multimedia storytelling can support self-paced exploration [2],[3]. Nevertheless, the presence of interactive features does not, by itself, establish that a platform is usable, accepted by visitors or effective for learning. Evaluating users who have experienced iKelirieng can provide preliminary evidence of how they perceive its usefulness, ease of use and suitability for interpreting Kelirieng heritage.

To address this need, iKelirieng was developed as a digital interpretation platform for Kelirieng heritage at Muzium Negara, Kuala Lumpur. It combines QR-code access, AR, digital storytelling and interactive

learning through four components: History, Motifs, Structure and Quiz. This study examines users' self-reported digital readiness and perceptions of iKelirieng, including perceived usefulness, perceived ease of use and attitude towards using the platform. It addresses the following questions: (1) What digital-learning preferences and self-reported readiness do respondents report? (2) How do respondents perceive the usefulness and ease of use of iKelirieng? and (3) What attitudes do respondents report towards using iKelirieng for museum-based heritage interpretation? The study provides a descriptive evaluation of user perceptions and does not directly measure learning gains or changes in cultural knowledge.

because it can combine digital information with physical environments and offer context-sensitive ways to explore heritage [2],[3] in a systematic review, map AR applications across cultural heritage contexts and identify both implementation challenges and opportunities. This literature supports the relevance of AR for heritage interpretation while emphasising the need to evaluate applications in relation to their context, interface and intended users rather than if the inclusion of AR guarantees a positive experience.

Digital interpretation in museums extends beyond AR and may include digital narratives, multimedia content and interactive activities that enable visitors to explore information at their own pace. Research on museum digital culture highlights the evolving relationship between physical collections and digital access [4], while studies of digital interpretation at heritage sites emphasise the importance of evaluating visitors' experiences of the technologies provided [5]. In iKelirieng, QR-code access and the four content components are intended to support exploration of Kelirieng's history, motifs and structure while keeping the physical artefact as the interpretive anchor.

Interactive quizzes and gamified tasks can encourage active participation and provide opportunities to engage with content beyond reading static descriptions. [6], [7] examine gamified, location-based AR for cultural heritage education, while [8], [9] review gamification research in tourism and hospitality. Nevertheless, engagement should not automatically be equated with knowledge acquisition. A user-perception survey can indicate whether respondents report a favourable experience, but claims about learning effectiveness require appropriate outcome measures, such as pre- and post-activity knowledge assessments or other validated indicators.

The Technology Acceptance Model (TAM) provides a theoretical basis for examining responses to digital systems. [10] identifies perceived ease of use and perceived usefulness as central beliefs associated with technology acceptance. Perceived ease of use refers to the extent to which a person believes that using a system will require little effort, whereas perceived usefulness concerns the extent to which the system is believed to improve task

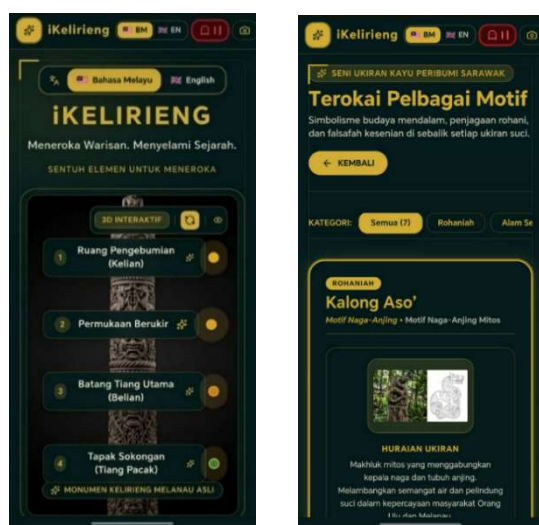


Fig. 1 iKelirieng interface

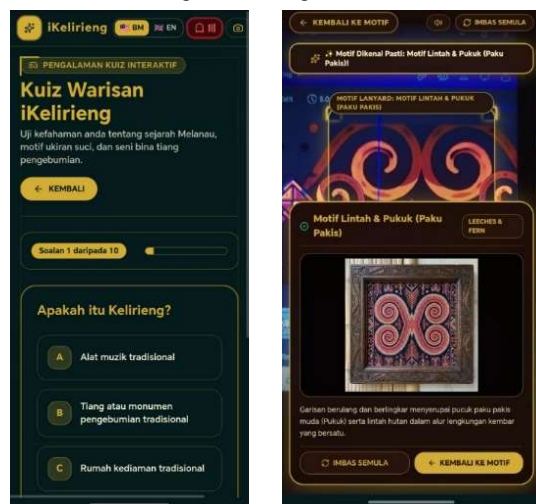


Fig. 2 Interactive activity

II. LITERATURE REVIEW

Augmented reality (AR) has been explored as a tool for tourism and cultural heritage interpretation

performance. Attitude towards using refers to a person's overall evaluation of using the system. In this study, these constructs are considered alongside self-reported digital readiness, which provides context about respondents' preferences for digital learning rather than an objective measure of digital competence.

Overall, previous research establishes the relevance of AR and interactive digital media for heritage interpretation. The contribution of this study is a user-focused, descriptive evaluation of iKelirieng that brings together reported digital-learning preferences and perceptions of usefulness, ease of use and attitudes towards use.

III. METHODOLOGY

This study employed a quantitative, cross-sectional survey to examine users' perceptions of iKelirieng after they had experienced the digital heritage interpretation platform. Purposive sampling was used to recruit 122 respondents who had used iKelirieng. Data were collected using a structured online questionnaire administered through Google Forms. The questionnaire included dichotomous (Yes/No) items and five-point Likert-scale items ranging from strongly disagree to strongly agree. The reported questionnaire sections covered self-reported digital readiness, perceived usefulness, perceived ease of use and attitude towards using the platform, adapted from [11]. Responses were summarised using descriptive statistics, specifically frequencies and percentages. No inferential tests were conducted; therefore, the findings describe response patterns among the participants surveyed.

IV. RESULTS AND DISCUSSION

This section reports responses from 122 participants who had used iKelirieng. The results are organised around the questionnaire areas reported in Table 1: user digital readiness, perceived usefulness, perceived ease of use and attitude towards using the platform. The responses were measured using a five-point Likert scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.

TABLE 1
RESPONSE PERCENTAGES FOR QUESTIONNAIRE ITEMS RELATED TO IKELIRIENG

Item	1	2	3	4	5
User Digital Readiness (DR)					
1. Do you think learning is supposed to be entertaining and fun?	-	0.8% (n=1)	-	-	99.2% (n=121)
2. Do you prefer to learn using digital tools rather than books?	-	2.5% (n=3)	-	-	97.5% (n=119)
3. Do you prefer to see images rather than long text?	-	3.3% (n=4)	-	-	96.7% (n=118)
4. Can you use a new digital gadget without reading the manual?	-	9% (n=11)	-	-	91% (n=111)
5. Can you listen to music, talk on the phone, and use the computer at the same time?	-	9% (n=11)	-	-	91% (n=111)
6. Do you really need the internet to learn or to work?	-	1.6% (n=2)	-	-	98.4% (n=120)
7. Do you prefer to learn out of the school environment rather than traditional?	-	4.1% (n=5)	-	-	95.9% (n=117)
User Experience Survey (PU)					
1. I can obtain information through iKelirieng quickly.	2.5% (n=3)	-	2.5% (n=3)	11.5% (n=14)	83.6% (n=102)
2. Using the iKelirieng helps me expand my knowledge.	2.5% (n=3)	-	2.5% (n=3)	18% (n=22)	77% (n=94)
3. Using the iKelirieng increases my learning effectiveness at Muzium Negara.	2.5% (n=3)	-	1.6% (n=2)	15.6% (n=19)	80.3% (n=98)
4. I believe the iKelirieng will make my visit to Muzium Negara more productive.	-	0.8% (n=1)	0.8% (n=1)	15.6% (n=19)	80.3% (n=98)
Perceived Ease of Use (EU)					
1. I find it easy to learn how to use the iKelirieng.	1.6% (n=2)	3.3% (n=4)	3.3% (n=4)	16.4% (n=20)	78.7% (n=96)
2. I feel that the iKelirieng system is easy to control.	1.6% (n=2)	-	4.1% (n=5)	13.9% (n=17)	80.3% (n=98)
3. My interaction with iKelirieng is clear and understandable.	1.6% (n=2)	-	1.6% (n=2)	13.1% (n=16)	83.6% (n=102)
4. I believe the iKelirieng is easy to use overall.	1.6% (n=2)	-	1.6% (n=2)	13.1% (n=16)	83.6% (n=102)
5. My experience learning to use the iKelirieng was favorable.	1.6% (n=2)	-	3.3% (n=4)	11.5% (n=14)	83.6% (n=102)

6. The layout and information on the iKelirieng are easy to understand.	1.6% (n=2)	-	4.1% (n=5)	11.5% (n=14)	82.8% (n=101)
7. It was easy for me to become skillful at using the iKelirieng.	1.6% (n=2)	-	3.3% (n=4)	13.9% (n=17)	81.1% (n=99)
8. I believe the iKelirieng is flexible to use.	1.6% (n=2)	1.6% (n=2)	2.5% (n=3)	16.4% (n=20)	78.7% (n=96)
Attitude Toward Using (AT)					
1. Using the iKelirieng to explore Muzium Negara is a good idea.	1.6% (n=2)	-	2.5% (n=3)	9% (n=11)	86.9% (n=106)
2. The iKelirieng has a more positive influence on my experience than static displays.	1.6% (n=2)	-	4.1% (n=5)	8.2% (n=10)	86.1% (n=105)
3. I intend to visit Muzium Negara and use the iKelirieng again in the future.	1.6% (n=2)	-	1.6% (n=2)	12.3% (n=15)	82.8% (n=101)

The responses indicate strong self-reported preferences for digital and engaging learning experiences. The highest level of strong agreement was recorded for the statement that learning should be entertaining and fun (99.2%, $n = 121$). A total of 98.4% ($n = 120$) strongly agreed with the statement that internet access was necessary for learning or work. Preferences for digital learning tools and visual content also recorded high levels of strong agreement, at 97.5% and 96.7%, respectively. Respondents generally reported favourable perceptions of iKelirieng in relation to information access and perceived learning benefits. A total of 83.6% ($n = 102$) strongly agreed that the platform enabled them to obtain information quickly, while 80.3% ($n = 98$) strongly agreed that it increased learning effectiveness at Muzium Negara. A further 80.3% ($n = 98$) strongly agreed that iKelirieng could make their museum visit more productive. These results suggest that respondents perceived potential benefits for museum exploration. The findings indicate favourable self-reported perceptions of iKelirieng's ease of use. Strong agreement was highest for interaction clarity, overall ease of use and the favourability of the learning-to-use experience (83.6% for each item). In addition, 82.8% strongly agreed that the platform's layout and information were easy to understand. These responses suggest that participants generally found the platform understandable and relatively easy to use. Respondents reported positive attitudes towards using

iKelirieng for museum exploration. A total of 86.9% ($n = 106$) strongly agreed that using the platform to explore Muzium Negara was a good idea, while 86.1% ($n = 105$) strongly agreed that it had a more positive influence on their experience than static displays. Additionally, 82.8% ($n = 101$) strongly agreed that they intended to use iKelirieng again in the future. These findings indicate favourable reported attitudes and intention to reuse the platform. Taken together, the results show predominantly positive responses across the reported questionnaire areas: digital readiness, perceived usefulness, perceived ease of use and attitude towards using iKelirieng. Respondents generally favoured digital and visual learning experiences and perceived the platform as accessible and potentially useful for museum exploration. Previous studies have examined the use of digital technologies and augmented reality in museum experiences and cultural heritage learning [7], [12], [13], [14].

V. CONCLUSION

This study examined users' perceptions of iKelirieng, a digital heritage interpretation platform that integrates QR-code access, AR, digital storytelling and interactive quizzes to support interpretation of Kelirieng heritage at Muzium Negara. Among the 122 respondents, reported responses were predominantly positive across self-reported digital readiness, perceived usefulness, perceived ease of use and attitudes towards using the platform. Participants generally viewed iKelirieng as accessible and potentially useful for museum exploration. The study contributes an initial, context-specific account of user perceptions of a digital approach to interpreting Kelirieng heritage. For museum practice, iKelirieng may complement physical displays by providing additional contextual information and interactive ways to explore the heritage's history, motifs and structure. It should not replace physical collections, curatorial interpretation or community knowledge. Evaluating visitors' experiences is therefore important for understanding how these technologies are received in specific heritage contexts [5], [15].

Several limitations should be acknowledged. Purposive sampling and descriptive statistics limit the extent to which the findings can be generalised to

other museum visitors. Future research could use mixed methods, task-based usability testing or pre- and post-activity knowledge measures to examine educational outcomes. Subject to these limitations, iKelirieng shows promise as a complementary digital heritage interpretation resource and provides a foundation for further user-centred development.

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