

# A CASE STUDY OF THE SARAWAK CULTURAL VILLAGE (SCV) APPLICATION: AN EVALUATION OF USER PERCEPTION OF SCV APPLICATION

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## ABSTRACT

In the wake of the post-Covid-19 challenges affecting tourism and education, this study delves into the growing importance of virtual museum applications as a means of cultural heritage learning. Focusing on the Sarawak Cultural Village (SCV) application, the research explores user perceptions, media availability, and demands related to virtual museums. Utilizing a case study approach involving Sarawakians at Universiti Malaysia Kelantan, the investigation evaluates their perception of the SCV application and provides recommendations for its enhancement. Notably, all responses indicate agreement with the significance of virtual museums for cultural heritage learning, with a minimum mean score of 3.95. The findings underscore the value of virtual museums in disseminating cultural heritage knowledge within the local context. The study recommends enriching the SCV application with multimedia elements, such as 3D models, animations, and videos, along with clear operational instructions. Furthermore, it suggests incorporating assessment features to reinforce learning. These recommendations are anchored in an established user experience model aiming to deliver a seamless user experience for local cultural heritage content, particularly within the “virtual tour” section in SCV.

**Keywords:** Perception, User Experience, Virtual Museum, Sarawak Cultural Village Application

## INTRODUCTION

Post-Covid-19 is one of the most challenging eras in human history, with several sectors, including tourism and education, being dramatically affected due to the lack of physical participation (Kaushal & Srivastava, 2021; Pokhrel & Chhetri, 2021). The study also reveals a decrease in the number of physical museum visitors over time due to the implications of Covid-19. In recent years, virtual technology in cultural learning through virtual museum applications has garnered significant attention as a new platform that encourages people to learn about cultural heritage without the need for physical presence in a real museum (Wei *et al.*, 2019). Consequently, virtual museums are believed to become the new medium for preserving, conserving, and learning cultural heritage, replacing conventional museums. Previous research has incorporated virtual reality (VR) and augmented reality (AR) presentation technologies to enhance the exhibition of cultural heritage, such as historical sites or museums (Bachiller *et al.*, 2023). A survey conducted in Europe showed that 35% of museums have already implemented VR and AR technologies to engage and interest visitors in their collections (Ibrahim & Ali, 2018).

The usage of virtual museums became essential during the Covid-19 pandemic when movement restrictions were imposed. However, there is limited evidence to prove the effectiveness of virtual museum technology for learning, conserving, and preserving cultural heritage (Povroznik, 2018). On the other hand, studies suggest that virtual museum technology can provide a more rewarding experience through the implementation of multimedia information data (Pietroni *et al.*, 2018; Styliani *et al.*, 2009). To understand how this rewarding experience of virtual museums can be achieved in learning, conserving, and preserving cultural heritage, this paper aims to determine user perceptions of virtual museums, while reviewing existing virtual museums to investigate the potential of virtual reality technology for archiving artifacts and its suitability as a medium for cultural heritage learning.

A study was conducted to explore user perceptions, media availability, and demands regarding virtual museums. Sarawak Cultural Village (SCV), a living museum that attracts numerous visitors annually, has embraced virtual technology in preserving and exhibiting cultural heritage artifacts. The Sarawak Cultural Village application (SCV Experience) was chosen as the virtual museum application to be tested by Sarawakians, with the goal of investigating their perception towards developed virtual museum. Additionally, this paper aims to (1) conduct a case study among Sarawakian in Universiti Malaysia Kelantan in order to evaluate the their perception on SCV application, and (2) provide recommendations for improving the efficiency, effectiveness, and user satisfaction of the Sarawak Cultural

Village application based on the user experience model proposed by Abdul Ghani & Wan Shamsuddin (2020), which considers elements of user experience.

This study aims to determine the user perception of the Sarawak Cultural Village application and investigate the availability of media in the applications and then provide suggestions for improvement. The study was conducted from November 15th to November 20th, 2022, to examine the perception of Sarawakians towards the virtual digital museum. The Sarawak Cultural Village application will be subjected to analysis based on the User Experience Model. This analysis aims to identify the diversity of media elements and uncover potential issues that can be addressed for the purpose of enhancing the overall user experience. Since virtual museums are considered a new technology in cultural heritage preservation and learning, it is crucial to understand the perceptions of users towards learning and preserving cultural heritage through virtual reality technology before widespread implementation in other sectors such as education, tourism, and training.

In summary, the supportive findings from this introduction and the literature review demonstrate the positive impact of virtual museums on cultural heritage learning during the post-Covid-19 pandemic. However, it is essential to consider the opinions of potential users of virtual museum technology. Therefore, user perceptions and demands must be investigated to obtain accurate results regarding of virtual museum technology usage for cultural heritage learning in the Sarawak region.

## LITERATURE REVIEW

### Virtual Museum

The emergence of virtual museum concepts traces back to the 1990s, and it prompted the International Council of Museums (ICOM) to revisit and update its definition of what constitutes a museum (Paquin, 2016). According to Article 3, Section 1 of the ICOM Statutes, a museum is characterized as follows:

A non-profit institution that is accessible to the public, enduring within society and its evolutions, dedicated to the preservation, exploration, communication, and display of both tangible and intangible aspects of human heritage and their surrounding environments, all with the goal of facilitating education, research, and enjoyment (Paquin, 2016). While, Pietroni *et al.* (2016) emphasize that the concept of a virtual museum extends beyond merely delivering information about cultural heritage. Instead, they assert that it should offer a comprehensive learning and emotional experience for its users, thereby enhancing the overall user experience. Furthermore, they underscore the importance of a well-structured

content framework, which includes Graphic User Interface (GUI) design and storytelling elements. This cohesive approach is essential to facilitate the natural, accessible, and emotionally engaging cognitive processes of museum visitors in the virtual realm.

The primary objective of virtual museums is centered on the discovery and preservation of cultural heritage, along with the mission to educate the public about significant historical aspects. According to Szabo *et al.* (2017), they emphasize that digital cultural heritage, or virtual museums, aim to create immersive experiences that boost visitor engagement. They argue that a virtual museum can be seen as a communicative extension of physical museums, designed to elevate the appreciation and understanding, or learning, of specific cultural facets.

Another notable trend in virtual museum technologies and methodologies is the provision of interactive exhibitions, communication platforms, and learning activities that center around cultural heritage, as highlighted by Karadimas *et al.* (2019). In addition to this, virtual museums aim to offer a personalized and immersive experience while simultaneously contributing to the preservation of cultural heritage.

## **User Experience**

In the field of human-computer interaction (HCI), the concept of user experience (UX) is described as a dynamic interplay of individual perception, emotions, cognitive processes, motivation, and actions. This interplay extends to how individuals interact with their surroundings, including the physical environment, temporal aspects, interactions with people, and engagement with objects, as outlined by Kuliga *et al.* (2015). According to Pietroni *et al.* (2016), UX serves as a valuable framework for understanding how individuals perceive value in their interactions with various products, applications, or experiences.

UX, as per the ISO 9241-210 definition, serves as an overarching term encompassing a user's overall perception, which includes usability. However, it is important to note that the measurement methods for these aspects can differ significantly. Usability is primarily concerned with objective measurements, focusing on the efficiency and effectiveness of a system, while UX places a stronger emphasis on subjective measurements, considering the user's emotional and experiential responses to a product or system.

It is worth highlighting that there are clear distinctions in measurement methods between usability and UX. Usability is predominantly assessed using objective metrics, whereas UX relies on subjective assessments that capture the user's feelings, satisfaction, and overall experience. Additionally, it is important to recognize that usability measures do not encompass all the facets of the broader UX, as pointed out by Rusu *et al.* (2017).

While, perception indeed holds a fundamental role in the realm of user experience (UX), especially in the context of cultural heritage applications (Konstantakis & Caridakis, 2020). In UX, perception encompasses the intricate process through which individuals interpret and derive meaning from sensory information in their surroundings. When applied to cultural heritage applications, perception can significantly impact users' attitudes, behaviors, and overall satisfaction with the application (Chen & Chen, 2010).

### **Cultural Heritage**

According to UNESCO, Cultural heritage, the legacy of past generations, is an invaluable resource that reflects the identity, history, and values of societies worldwide. It encompasses tangible artifacts, monuments, and historic sites as well as intangible elements like traditions, languages, and knowledge systems. Preservation and understanding of cultural heritage have become increasingly crucial in the face of globalization, urbanization, and technological advances (Elfaragy & Rizq, 2018). Cultural heritage plays a crucial role in shaping the identity and character of communities and nations. It serves as a repository of collective memory, enabling individuals to connect with their roots and fostering a sense of belonging and continuity (Harun *et al.*, 2017). Moreover, it has educational, social, and economic implications, contributing to cultural diversity, tourism, and sustainable development.

## **METHODOLOGY**

This research constitutes a case study involving Sarawak students in Universiti Malaysia Kelantan (UMK) who have experienced visiting the physical Sarawak Cultural Village. The research employed two type of methods in order to achieve the objective of the research, which are: user perception evaluation and observation.

### **Perception Evaluation**

First method is perception evaluation, this approach is a quantitative method to measure user perception of the Sarawak students towards the Sarawak Cultural Village (SCV) application. Perception evaluation often referred to as perceptual evaluation, a process used to assess and measure the quality or characteristics of sensory stimuli, such as audio, visual, or other sensory information. It involves the subjective judgement or assessment of individuals to evaluate various aspects of these stimuli. Perception evaluation can be used to gauge users' subjective experiences when interacting with a product, website, or application. It helps identify issues related to aesthetics, and overall user satisfaction or feelings. Therefore a

case study has was employed in order to evaluate UMK students evaluation or judgement towards the SCV application.

### **Observation**

In the second method, data collection for the case study was conducted through the analysis of the Sarawak Cultural Village application. An observational study was conducted to review and identify application's features, functionality, and media availability. This analysis aimed to provide improvements that would contribute to diversity of the medias as well as a good and comprehensive features in order to enhance user experience and suite with the user emotion during the application interaction. According to Yahya (1997), observation is considered a direct evaluation approach for assessing application effectiveness and is the most suitable method for evaluating an educational application. This method has been employed in museum content evaluations for many years and was popularized by psychologists Edward S. Robinson and Arthur W. Melton. Since then, numerous studies on museum content have utilized the observation method, such as (Champion, 2016; Chandini Pendit *et al.*, 2016; Economou *et al.*, 2017)

### **Instrument**

Research data regarding user perception of virtual museum technology applications in cultural heritage learning was collected through the administration of a set of questionnaires in a survey. The designated questionnaire served as the instrument for data collection, which was adopted from Al-Aidarooos (2017) as a well-known and appropriate instrument for measuring user acceptance and perception of technology (Pendit *et al.*, 2018). The original questionnaire was initially designed to assess perceptions of technology use in the context of Umrah content. Subsequently, it was adapted for the evaluation of cultural heritage content. The questionnaire utilized a five-point scale, with options ranging from 5 (strongly agree) to 1 (strongly disagree). Ten questions were designed to assess user perception towards the SCV application as a virtual museum for cultural heritage learning and conserving (refer to Table 1).

**Table 1:** Questionnaires Items.

No	Questions
Q1	Virtual Museum is a better medium than the traditional mode of a museum to deliver information about the Sarawak Culture Village.
Q2	Virtual Museum is a better medium than the traditional mode of a museum to educate the user about the history of the Sarawak Culture Village.

**Table 1:** Continued.

No	Questions
Q3	I preferred to use a virtual museum than visit a traditional mode of museum.
Q4	I learn better about the Sarawak Culture Village using a Virtual Museum than a physical visit
Q5	The virtual museum allows learners to understand the Sarawak Culture Village contents better.
Q6	Conservation of the Sarawak Culture Village using visual technology is necessary.
Q7	Virtual museum keeps me motivated to learn about the Sarawak Culture Village.
Q8	Virtual Museum is an innovative way to conserve the Sarawak Culture Village.
Q9	Delivering information about the Sarawak Culture Village using virtual museums is more effective.
Q10	The virtual museum provides me more meaningful experience than a physical visit.

### Participants

Forty (40) respondents were selected from the Sarawak community in UMK, all of whom had prior experience of physically visiting the Sarawak Cultural Village, to participate in this investigation. According to Othman *et al.* (2022), a sample size of 40 respondents is deemed sufficient for evaluating an application. Before taking part in the survey, the respondents were required to interact with the Sarawak Cultural Village application. This process allowed users to differentiate and compare their experiences of visiting the Sarawak Cultural Village virtually versus physically. Subsequently, the respondents responded to the questionnaire based on their prior knowledge and understanding of the Sarawak Cultural Village Application. Finally, descriptive analysis will be used to analyze the collected data.

### Perception Evaluation Procedure

The research procedure aligns with the recommendations put forth by Othman *et al.* (2022).

The study procedure unfolded as follows:

1. **Participant Recruitment:** We recruited a group of 40 participants to take part in the study.
2. **Orientation Session:** Participants received a comprehensive briefing about the study's objectives and the testing procedures.
3. **Virtual Tour Assessment:** Following the briefing, participants were presented with a demonstration on how to navigate and utilize the system. They were then invited to explore the virtual tour at their own pace.
4. **Survey Administration:** Upon completing their virtual tour experience, participants were asked to fill out a questionnaire to provide their feedback and insights.

5. **Debriefing Session:** To address any questions or concerns, an instructor facilitated a debriefing session, ensuring that participants had the opportunity to seek clarification or offer additional comments.

### **Observation Evaluation Procedure**

The process of reviewing or evaluating the SCV application using the UX model involves several steps:

1. **Choose a Model:** The choice of the user experience model by Abdul Ghani & Wan Shamsuddin (2020) for this study was deliberate. This particular model was selected due to its tailored focus on user experience in the context of cultural heritage content applications, as well as its systematic development.
2. **Define Criteria:** The criteria for evaluating the Sarawak Cultural Village (SCV) will encompass the pragmatic quality, hedonic quality, behavioral factors, and psychological constructs outlined in the model. Additionally, the availability and accessibility of media will also be considered in the evaluation process. (The criteria as shown in Table 1)
3. **Create Evaluation Tool:** The identified criteria will be transformed into a checklist tool (Table 1) for assessing the Sarawak Cultural Village (SCV). This tool will serve as a guide during the evaluation, facilitating the collection of structured data.
4. **Collect Data:** This process involves direct interaction with the application, observation, or reviewing the SCV application's design and functionality. The availability of the criteria will be assessed and documented within the evaluation tool by the researcher.
5. **Analyze Data:** The collected data will be analyzed to assess the alignment of the SCV application with the UX model.
6. **Interpretation:** The evaluation results will be interpreted to identify any gaps in media within the CSV application. Possible suggestions for improvement and enhancement of the SCV application will then be discussed for future development.
7. **Documentation:** Document the entire evaluation process, including the model used, evaluation tools, data collection methods, results, and any insights gained during the evaluation.

## **ANALYSIS AND FINDING**

In the case study, a total of forty (40) respondents participated, with 35% being male and 75% female. The majority of respondents fell into the age range of 19 to 25 years old (78%),



followed by 26 to 35 years old (12%), 36 to 45 years old (7%), and 46 years old and above (3%).

Based on the questionnaire data, it was found that 68% of the respondents had never heard about the Sarawak Cultural Village Application, and 32% had not visited or used the application to learn about cultural heritage in Sarawak. However, all respondents had physically visited the Sarawak Cultural Village.

The results indicate that respondents who had physically visited the Sarawak Cultural Village believed that a virtual museum or digital application is a better medium for delivering cultural content and historical building information. They also perceived it as a promising approach to interactively and effectively educate people about the local cultural heritage (Q1 = mean 4.10, SD = 0.778 and Q2 = mean 4.15, SD = 0.770), as shown in Figure 1. Moreover, respondents preferred using the Sarawak Cultural Village application (virtual museum) compared to physically visiting the traditional mode of the Sarawak Cultural Village (Q3 = mean 3.95, SD = 0.932). They also felt that they could learn and understand the cultural heritage and local ethnic group houses of Sarawak better using the digital application rather than through a traditional visit (Q5 = mean 4.05, SD = 0.876). This perception was influenced by the respondents' high motivation to learn about history and cultural heritage through the application when they interacted and engaged with the device (Q7 = mean 4.20, SD = 0.758). Additionally, the respondents believed that the local ethnic group houses or artifacts in the Sarawak Cultural Village should utilize visual technology as an innovative way to conserve the local cultural heritage (Q6 = mean 3.95, SD = 1.061 and Q8 = mean 4.45, SD = 0.639).

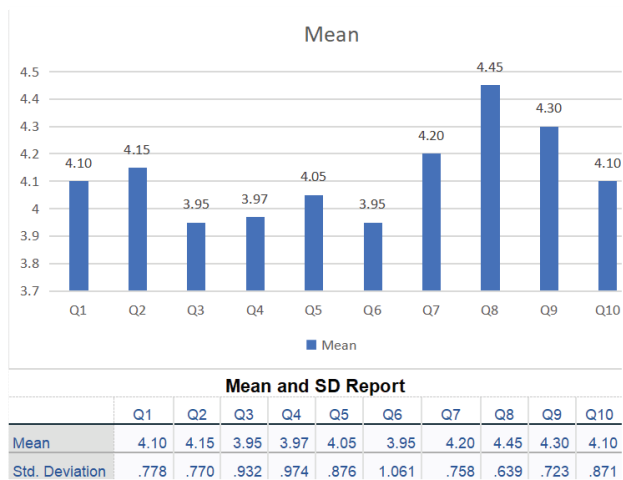


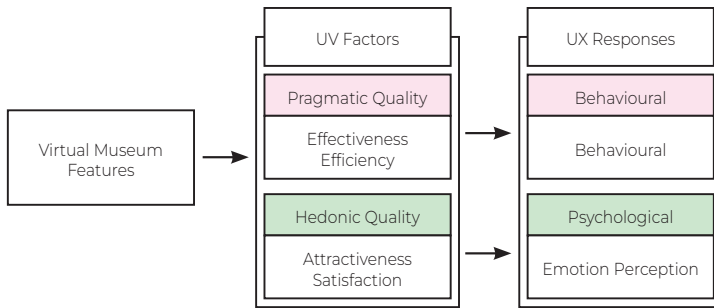
Figure 1: Means score for items in questionnaires.

However, the study found that the effectiveness of delivering information, learning through the virtual museum, and the meaningful experience of using the Sarawak Cultural Village application for delivering information about the history of historical buildings and cultural heritage was perceived to be moderate (Q4 = mean 3.95 SD = 0.974, Q9 = mean 4.30 SD = 0.723, and Q10 = mean 4.10 SD = 0.871). This moderate agreement is attributed to some respondents facing difficulties in handling digital applications, especially elderly users. Additionally, some respondents had no prior experience using virtual museums for cultural heritage learning, and only a few of them were familiar with the virtual museum, particularly the Sarawak Cultural Village application.

Despite these challenges, the study's findings demonstrate an overall positive perception. Therefore, the virtual museum can be considered a better medium for delivering information and educating users about cultural heritage, historic buildings, and local customs. It can be concluded that virtual museums hold strong potential as a platform for cultural heritage preservation and learning. Virtual museums provide added value to the visitor experience, save exhibition space and management costs, and offer higher visitor satisfaction (Elfarargy & Rizq, 2018; Karadimas *et al.*, 2019; Rahim *et al.*, 2018; Skamantzari & Georgopoulos, 2016). Moreover, they offer interactive exhibitions and educational activities, contributing to the learning process (Clini *et al.*, 2018; Ismaeel & Al-Abdullatif, 2016; Karadimas *et al.*, 2019). Considering the user experience (UX) in virtual museum development enhances the meaningfulness of the learning process (Pietroni *et al.*, 2018; Vermeeren *et al.*, 2016). Therefore, this study incorporates user experience components from the User Experience Model (Abdul Ghani & Wan Shamsuddin, 2020) to improve the existing Sarawak Cultural Village application for informal learning and enhance the performance of the virtual museum application while prioritizing user experience.

### **Cultural Sarawak Village Application Review**

The Sarawak Cultural Village Application has been evaluated using the observation method, and the findings will now be presented along with recommendations for improvement based on the User Experience Model by Abdul Ghani & Wan Shamsuddin (2020). This model (depicted in Figure 2) was selected for the review and analysis of the application because it is the most up-to-date model pertaining to virtual museum development, aiming to enhance the user experience during application interaction. Furthermore, the model has been specifically designed with consideration for Malaysian cultural conservation and preservation. It is important to note that different cultures, beliefs, and geographical contexts can influence perceptions, experiences, and acceptance of technology, as emphasized by Wu *et al.* (2019). Therefore, this model enables an accurate analysis from a Malaysian perspective.



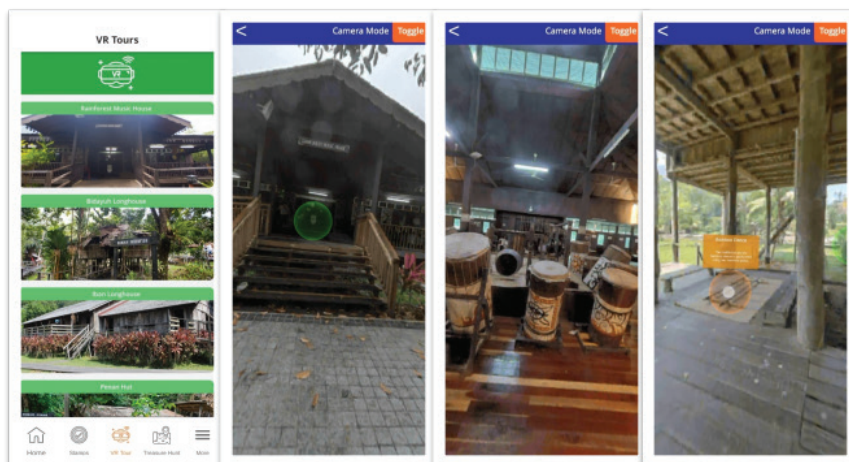
**Figure 2:** User experience model for digital application development (Abdul Ghani & Wan Shamsuddin, 2020).

Based on the user experience model by Abdul Ghani & Wan Shamsuddin (2020), achieving a comprehensive user experience involves considering four main elements: Pragmatic Quality, Hedonic Quality, User Behavioral Responses, and Physical Responses. With these elements in mind, the Sarawak Cultural Village application will be reviewed and analyzed to enhance the user experience.

The Sarawak Cultural Village application, also known as “SCV Experience,” is a mobile application that offers various features such as a virtual tour, maps, and online ticket purchasing for attractions in the Sarawak Cultural Village. The virtual tour feature is categorized based on different types of Sarawak traditional houses, as illustrated in Table 2. The application includes virtual representations of eight traditional houses, namely the Rainforest Music House, Bidayuh Longhouse, Iban Longhouse, Penan Hut, Orang Ulu Longhouse, Melanau House, Malay House, and Chinese House.

In the virtual tour, 360-degree panoramic views are utilized for exploration and navigation. To begin the tour, users are required to select their preferred house, which will then provide them with a 360-degree panoramic view. These panoramic views are captured using a special camera to digitally recreate the virtual environment. Users can explore the interior and exterior of the selected houses by rotating their phone to control the perspective of the panoramic view. They can also navigate through different points within the virtual environment to examine the overall structure of the houses.

The virtual tour application incorporates eyesight gesture control, enabling users to navigate and control the view specifically designed for phone-based VR headsets. As a result, the view in the virtual tour aligns with the movement and rotation of the user’s phone. The application provides brief information about the Sarawak traditional houses, local culture, and the lifestyle of ethnic groups through basic text elements.



**Figure 3:** The Sarawak Cultural Village Application (Virtual Museum).

User perception of the virtual museum and the need for its preservation and conservation are significant contributions of this research. The findings highlight the importance of improving the existing application to enhance the user experience in learning cultural heritage, specifically about Sarawak culture and ethnic group lifestyle. According to Abdul Ghani & Wan Shamsuddin (2020), two elements, hedonic and pragmatic quality, play a crucial role in achieving good user experience.

To improve the hedonic quality of the application, it is suggested to diversify multimedia elements in the virtual tour. Currently, the application primarily utilizes text elements, but incorporating video, audio, animation, and interactivity can make the experience more engaging and attractive. By enhancing these multimedia elements, the user's satisfaction value can be increased, resulting in a more immersive and enjoyable learning experience.

In terms of pragmatic quality, providing a self-directed learning environment is recommended. Currently, the application limits user movement by categorizing the traditional houses, requiring users to click on different buttons to access each house. This restriction can hinder self-directed learning and reduce system efficiency. Allowing users to freely explore and learn about the cultural heritage in Sarawak Cultural Village according to their preferences without limitations can enhance the application's pragmatic quality.

Additionally, incorporating assessments or quizzes after interacting with the virtual tour can increase user participation and focus. These activities not only engage users but also serve as a means to evaluate their understanding and learning of the content. Furthermore, providing clear instructions within the application on how to control, navigate,

and explore the virtual Sarawak Cultural Village will help users easily understand and operate the application, improving efficiency and user experience.

By considering these elements of effectiveness, efficiency, attractiveness, and satisfaction, the Sarawak Cultural Village virtual tour can enhance user experience, leading to improved behavioral and psychological responses and overall application performance.

**Table 2:** The review of the Sarawak Cultural Village application based on the User Experience Model Component.

		Sarawak Traditional House								
UX Factors	UX Parameter	Rainforest Music House	Bidayuh Longhouse	Iban Longhouse	Penan Hut	Orang Ulu Longhouse	Melanau House	Malay House	Chinese House	Review
	Eff Assessment	x	x	x	x	x	x	x	x	Virtual tour in all houses does not have assessment or quiz activity.
Pragmatic Quality	Instruction	x	x	x	x	x	x	x	x	No instruction on how to control and navigate all virtual houses.
	Efc Organize learning	x	x	x	x	x	x	x	x	The user cannot plan and organize the learning in the virtual tour.
	Texts	x	√	√	√	√	√	√	√	Most of the houses in the virtual tour obtain the text for artifacts explanation.
	Image	x	x	x	x	x	x	x	x	Virtual tour in all houses does not have an image as visual aids.
Hedonic Quality	Att Audio	x	x	x	x	x	x	x	x	Virtual tour in all houses does not have audio for detailed explanation and background music.
	Video	x	x	x	x	x	x	x	x	Virtual tour in all houses does not have video as visual aids in their presentation.
	Animation	x	x	x	x	x	x	x	x	Virtual tour in all houses does not have animation as visual aids in their presentation.

**Table 2:** Continued.

		Sarawak Traditional House								
UX Factors	UX Parameter	Rainforest Music House	Bidayuh Longhouse	Iban Longhouse	Penan Hut	Orang Ulu Longhouse	Melanau House	Malay House	Chinese House	Review
	3D Model	x	x	x	x	x	x	x	x	Virtual tour in all houses does not have 3D model used to illustrate their artifacts.
	Interactivity	√	√	√	√	√	√	√	√	All the virtual houses have minimum interactivity.
Sat	Self-Directed Learning	x	x	x	x	x	x	x	x	The application has not provided self-directed learning, which does not allow the user to freely explore and learn about the contents.

\*Eff: effectiveness, Efc: Efficiency, Att: Attractiveness, Sat: Satisfaction, x: Not available, √: Available.

The Sarawak Cultural Village application analysis revealed several shortcomings in meeting the guidelines and parameters for delivering a good user experience in cultural heritage learning, as shown in Table 2. The application lacked in various aspects, with only minimal achievements in text availability and interactivity. The brief use of text elements and limited interactivity in controlling the camera view and navigation hindered the comprehensive understanding and engagement of users.

To address these deficiencies and enhance the user experience, several recommendations are proposed for improving the Sarawak Cultural Village application. First and foremost, interactivity should be expanded to involve users in actively interacting with digital materials and artifacts within the exhibition. Enabling features like zooming, holding, and capturing virtual artifact images during the virtual tour will create a more immersive and engaging experience. Additionally, the application should focus on providing comprehensive explanations for text elements, offering detailed information about instrument names, artifacts, and local lifestyle. This will ensure that users gain a thorough understanding of the cultural heritage being presented. Furthermore, it is crucial to integrate the identified UX parameters from Table 1 into the existing application. This entails addressing attractiveness, satisfaction, self-directed learning, assessments/quizzes, clear instructions, and efficient

navigation. By incorporating these elements, the application can significantly enhance the user experience and improve user learning performance.

Overall, by implementing these recommendations, the Sarawak Cultural Village application can overcome its shortcomings, deliver a more comprehensive user experience in cultural heritage learning, and increase user engagement and understanding of Sarawak's rich cultural heritage.

## **CONCLUSION**

This investigation is a case study to evaluate perception of the Sarawakian in UMK towards the SCV application, the respondents participating in this investigation have prior experience visiting the Sarawak Cultural Village in person. Additionally, it involves a comprehensive review of the SCV application to evaluate the availability of media elements. The ultimate goal is to provide recommendations for improvement using the UX Model. This investigation has provided valuable insights into the perception and demands of consumers regarding virtual museum applications in cultural heritage learning. All the questions demonstrate a minimum mean score of 3.95, aligning with the "Agree" stage of agreement regarding the significance of virtual museums as platforms for learning and preserving cultural heritage (1.00-1.80: Strongly disagree, 1.81-2.61: Disagree, 2.62-3.42: Neutral, 3.43-4.23: Agree, and 4.24-5.00: Strongly Agree). The positive results and data obtained during the perception evaluation have shed light on the necessity of virtual museums in the local context for the effective dissemination of cultural heritage knowledge. These findings not only contribute to the understanding of cultural heritage learning and digitalization but also serve as a foundation for further research in this field.

Additionally, the recommendations derived from the analysis of the existing application are a significant contribution of this study. This investigation recommends the incorporation of additional multimedia elements, such as 3D models, animations, and videos, within the Sarawak Cultural Village (SCV) application. It also suggests providing clear instructions on how to operate the application effectively. Furthermore, the study recommends the inclusion of assessment features that allow users to reflect on and reinforce their learning from the application. These recommendations are specifically aimed at improving the performance of the Sarawak Cultural Village application, with a focus on enhancing the "virtual tour" section. The suggestions are based on an established user experience model, ensuring that the proposed improvements align with the goal of delivering a seamless user experience in virtual museum applications, particularly in the context of local cultural heritage content.

By incorporating these recommendations, developers and stakeholders can make informed decisions to improve the existing application and create more engaging and effective virtual museum experiences. This study thus not only highlights the importance of virtual museums in cultural heritage preservation and learning but also provides practical guidance for enhancing the performance and user experience of such applications.

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