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**A CONCEPTUAL MODEL OF INTERACTIVE MUSEUM
EXHIBITION FOR INTANGIBLE DONGBA CULTURAL
HERITAGE**



**DOCTOR OF PHILOSOPHY
UNIVERSITI UTARA MALAYSIA
2025**



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ABSTRAK

Kaedah pendedahan tradisional di muzium-muzium budaya Dongba seringkali gagal mempersembahkan kekayaan dan kompleksiti budaya unik ini. Bentuk pendedahan tidak interaktif mereka gagal menarik penonton moden, terutamanya generasi muda. Walaupun banyak kajian berfokus pada pameran muzium interaktif untuk artefak warisan Budaya Ketara, didapati bahawa kekurangan model konseptual untuk pameran muzium interaktif yang disesuaikan dengan warisan budaya tak berwujud. Oleh itu, dengan mengambil Muzium Budaya Dongba Lijiang sebagai kajian kes, tesis ini memperkenalkan model konseptual untuk pameran muzium interaktif bagi warisan budaya tak berwujud Dongba. Objektif penyelidikan adalah: (i) mengenal pasti komponen utama pameran muzium interaktif online dan offline yang sesuai untuk warisan budaya tak berwujud Dongba, (ii) membangunkan model konseptual pameran muzium interaktif bagi warisan budaya tak berwujud Dongba, dan (iii) mengesahkan model konseptual pameran muzium interaktif bagi warisan budaya tak berwujud Dongba. Metodologi penyelidikan sains reka bentuk diadaptasi, melibatkan kajian awal dengan 126 responden untuk mengenal pasti komponen utama pameran muzium interaktif online dan offline, dibenarkan dengan literatur sebelum mereka bentuk model konseptual. Semakan pakar dijalankan bersama tujuh pakar untuk menyahkan model tersebut. Evaluasi pengguna meraih 123 peserta, di mana semua komponen model konseptual pameran muzium interaktif didapati diterima dan mampu menyediakan kandungan pendidikan, interaktif, dan kepuasan, mengikut turutan, kepada pengguna. Model konseptual ini berfungsi sebagai garis panduan bagi pengarah muzium dan pembangun pameran muzium interaktif untuk menerima kedua-dua pameran muzium interaktif online dan offline untuk warisan budaya tidak ketara secara meluas.

Kata kunci: Pengalaman pengguna, Pameran interaktif, Budaya Dongba, Warisan budaya tidak ketara.

ABSTRACT

The traditional display methods in the Dongba culture museums often fail to present the richness and complexity of this unique culture. Their non-interactive display forms fail to attract modern audiences, especially the younger generation. While numerous studies focus on interactive museum exhibitions for tangible heritage artifacts, it is found that a lack of a conceptual model for interactive museum exhibitions tailored to intangible cultural heritage. Therefore, taking Lijiang Dongba Cultural Museums as a case study, this thesis introduces a conceptual model for interactive museum exhibition for intangible Dongba cultural heritage. The study objectives are: (i) to identify the main components of online and offline interactive museum exhibitions suitable for intangible Dongba cultural heritage, (ii) to develop a conceptual model of interactive museum exhibition for intangible Dongba cultural heritage, and (iii) to validate the conceptual model of interactive museum exhibition for intangible Dongba cultural heritage. The design science research methodology is adapted, involving a preliminary study of 126 respondents to identify the main components of online and offline interactive museum exhibitions, justified with literature prior to designing the conceptual model. An expert review is conducted with seven experts to verify the model. User evaluation garnered 123 participants, where all components of the conceptual model for interactive museum exhibition are found acceptable and able to provide educational content, interactivity, and satisfaction, in that order, to the users. This conceptual model serves as guidelines for museum directors and interactive museum exhibition developers to embrace both online and offline interactive museum exhibitions for intangible cultural heritage at large.

Keywords: User experience, Interactive exhibition, Dongba culture, Intangible cultural heritage

ACKNOWLEDGEMENT

I am deeply grateful for the collective support of many people who directly or indirectly helped me along the way during my doctoral studies; without them, this thesis would not have been possible. To all of them, I extend my sincere gratitude. First, I would like to express my heartfelt thanks to Dr. Juliana Aida Abu Bakar for her guidance. Her support, kindness, patience, motivation, and expertise were crucial throughout my study. I feel truly fortunate to have had such a dedicated mentor to guide me to the finish line. I am also immensely grateful to my husband for his unwavering support, patience, and resilience through the challenges of my studies. In addition, I wish to thank my parents, whose encouragement and support have been my driving force. I am also thankful to my son, who, despite the distance, was willing to accompany me on this journey, offering encouragement and warmth by my side. I am truly blessed to have them in my life.

I extend my sincere appreciation to the experts who reviewed and enriched my work with their valuable suggestions and feedback. Special thanks go to the scholars at the Lijiang Museum, the inheritors of Dongba culture, my students, and all participants who dedicated their time to help me complete this study. I would also like to thank the people of Malaysia for their warmth and generosity, and Universiti Utara Malaysia (UUM) for providing extensive resources and support, especially the professors, faculty members, and teachers at the School of Creative Industry Management & Performing Arts (SCIMPA). Finally, I am grateful to my home country for the invaluable opportunity. As a member of the associate professor team at the Lijiang College of Culture and Tourism, I extend my sincere gratitude for the financial and holistic support that enabled me to complete this doctoral journey.

TABLE OF CONTENTS

PERMISSION TO USE	ii
ABSTRAK.....	iii
ABSTRACT	iv
ACKNOWLEDGEMENT	v
List of Tables.....	xi
List of Figures.....	xiii
CHAPTER ONE INTRODUCTION	1
1.1 Introduction	1
1.2 Background	3
1.2.1 Integration of technology and online-offline convergence into museums	3
1.2.2 Preliminary Study on the integration of technology into Dongba Culture Museum among museum visitors	8
1.3 Problem Statement	10
1.3.1 Lack of Conceptual Model Related to Interactive Museum Exhibition for Intangible Cultural Heritage	14
1.3.2 Lack of Efforts in Preserving Intangible Dongba Cultural Heritage	16
1.3.3 Research Gap	18
1.3.4 Research Questions	20
1.4 Research Objectives	20
1.5 Research Scope	21
1.6 Operational Definitions	22
1.7 Summary	24
CHAPTER TWO LITERATURE REVIEW	25
2.1 Introduction	25
2.2 Interactive Museum Exhibition	26
2.2.1 Concept of Interaction in Museums	27
2.2.2 Digital Technologies in Museums	29
2.2.3 Virtual Reality	31

2.2.4 Augmented Reality	34
2.2.5 Artificial Intelligence	39
2.2.6 H5 Interactive Display	40
2.3 Intangible Dongba Cultural Heritage	43
2.3.1 Historical Review of Dongba Culture	43
2.3.2 Definition and Value of Dongba Culture	46
2.3.3 Digital Display of Dongba Culture	46
2.3.4 Challenges and Future Directions	47
2.4 Museums and Intangible Cultural Heritage	48
2.4.1 Definition of Museum and Intangible Cultural Heritage	48
2.4.2 Concept Drawing of Non-Interactive and Interactive Museum Exhibition ..	50
2.4.3 SWOT of Museums and Intangible Cultural Heritage	52
2.5 Conceptual Model of Interactive Museum Exhibitions	54
2.5.1 Methods for Building Digital Museums	54
2.5.2 Online Digital Museum Construction Methods	61
2.5.3 Research on the Design of the Digital Conceptual Model of Dongba Culture	65
2.5.4 SWOT of Conceptual Model of Interactive Museum Exhibitions	74
2.6 User Experiences	75
2.6.1 Six Elements for Testing	75
2.6.2 SWOT of User Experiences	76
2.7 Museum Function and Goals	77
2.7.1 Functions	77
2.7.2 Goals	78
2.7.3 SWOT of Museum Function and Goals	79
2.8 Summary	80
CHAPTER THREE METHODOLOGY	81
3.1 Introduction	81
3.2 Design Science Research	82
3.2.1 Literature Review, Case Analysis	84
3.2.2 Interview, Survey, Questionnaire Methods	84
3.2.3 Data Collection Method	84

3.2.4 Ethics Consideration	87
3.3 Problem Identification	89
3.3.1 Status of the Dongba Culture Museum	89
3.3.2 Research and Development of Dongba Culture Digitisation	91
3.4 Identifying Solution	93
3.4.1 Scope and Boundaries	94
3.4.2 Demographics	94
3.4.3 Virtual Reality for Dongba Intangible Cultural Heritage	96
3.4.4 Interactive Exhibition for Intangible Cultural Heritage	98
3.4.5 Integration of Online and Offline Development	100
3.5 Design and Development	102
3.5.1 User Requirements	102
3.5.2 Conceptual Model Design	105
3.5.3 Navigational Experience and Interface Design	110
3.5.4 Development and Design of Online Museums	112
3.6 Demonstration	121
3.7 Pilot Test	124
3.8 Evaluation	126
3.8.1 Construction and Development Evaluation Method	127
3.8.2 Sampling & Procedure	127
3.9 Communication	130
3.10 Summary	131

CHAPTER FOUR A CONCEPTUAL MODEL OF MUSEUM INTERACTIVE EXHIBITION FOR INTANGIBLE DONGBA CULTURAL HERITAGE

133

4.1 Introduction	133
4.2 Expert Review	134
4.2.1 Expert Background	135
4.2.2 Data Presentation	137
4.2.3 Key Findings	143
4.2.4 Discussion of Research Findings	152
4.2.5 Expert Comments	153

4.3 Verified Model	157
4.3.1 Selection of Model Themes	157
4.3.2 Creative Ideas	158
4.3.3 Integration of Technology Requirements	159
4.3.4 Validation Results	161
4.3.5 Verified Model	161
CHAPTER FIVE INTERACTIVE MUSEUM EXHIBITION PROTOTYPE DEVELOPMENT	167
5.1 Introduction	167
5.2 Development Method	168
5.3 The 3D Representation of Physical IME	170
5.4 Proposed Layout of IME	173
5.5 Prototype for IME	179
5.5.1 H5 Prototype for IME	179
5.5.2 VR Prototype for IME	188
5.5.3 AR Prototype for IME	191
5.5.4 AI Prototype for IME	192
5.6 Pilot Test	194
5.6.1 Data Coding	195
5.6.2 Pilot Test Results	197
5.7 Summary	198
CHAPTER SIX USER EVALUATION ON MUSEUM MODEL	200
6.1 Introduction	200
6.2 Evaluation Session	200
6.2.1 Background of the Participants	201
6.2.2 Validity	203
6.2.3 Correlation & Multicollinearity Test	207
6.2.4 Descriptive Statistics	208
6.3 Discussion of Research Findings	215
6.4 Significant Observations from the Dongba IME Experience	218

6.5 Summary	220
CHAPTER SEVEN CONCLUSION	222
7.1 Introduction	222
7.2. Research Discussion	222
7.2.1. Research Objective One	224
7.2.2. Research Objective Two	224
7.2.3 Research Objective Three	226
7.3 Contributions of the Study	229
7.3.1 Theoretical Contributions	229
7.3.2 Methodological Contributions	231
7.3.3 Practical Contributions	232
7.3.4 Cultural Contributions	233
7.3.5 Innovative Contributions	233
7.4 Limitations of the Study	234
7.5 Future Work	236
7.6 Chapter Summary	237
REFERENCES	239
Appendix A	253
Appendix B	260
Appendix C	266
Appendix D	269
List Of Publications	271

List of Tables

Table 2.1 Museum classification.....	52
Table 2.2 SWOT of Museums and Intangible Cultural Heritage.....	53
Table 2.3 SWOT of Conceptual Model of Interactive Museum Exhibitions.....	74
Table 2.4 SWOT of User Experiences.....	76
Table 2.5 SWOT of Museum Function and Goals.....	79
Table 3.1 Participating research institutions.....	95
Table 4.1 Specialist areas of expertise.....	136
Table 4.2 Assessment of the Requirements for Online and Offline Museum Elements by Experts.....	137
Table 4.3 Experts' assessment results on museum functions.....	139
Table 4.4 Experts' assessment results regarding museum goals.....	140
Table 4.5 Results of the questionnaire survey on the immersive exhibition.....	143
Table 4.6 Results of the questionnaire survey on the online necessary.....	144
Table 4.7 Results of the questionnaire survey on the developed.....	144
Table 4.8 Results of the questionnaire survey on the offline.....	145
Table 4.9 Results of the questionnaire survey on the immersive exhibition.....	145
Table 4.10 Results of the questionnaire survey on the VR.....	146
Table 4.11 Results of the questionnaire survey on the AR.....	147
Table 4.12 Results of the questionnaire survey on the AI.....	147
Table 4.13 Results of the questionnaire survey on the learning environment.....	148
Table 4.14 Results of the questionnaire survey on the exhibition.....	148
Table 4.15 Results of the questionnaire survey on the goals.....	149
Table 4.16 Results of the questionnaire survey on the goals.....	149
Table 4.17 Results of the questionnaire survey on the expert opinions (1).....	149
Table 4.18 Experts' Suggestions (1).....	150
Table 4.19 Results of the questionnaire survey on the expert opinions (2).....	150
Table 4.20 Experts' Suggestions (2).....	151
Table 5.1 Key Tools and Technology Stack.....	170

Table 5.2 Data Coding for Elements.....	196
Table 5.2 Pilot Study Measurement Reliability.....	198
Table 6.1 Profile of participants' background.....	202
Table 6.2 Results of exploratory factor analysis for elements of engagement.....	206
Table 6.3 Matrix of Pearson correlation.....	208
Table 6.4 Descriptive Analysis of Technology Usability.....	209
Table 6.5 Descriptive Analysis for Aesthetics.....	210
Table 6.6 Descriptive Analysis for User Experience.....	211
Table 6.7 Descriptive Analysis for Content Effectiveness.....	212
Table 6.8 Descriptive Analysis for Satisfaction.....	213
Table 6.9 Descriptive Analysis for Enjoyment.....	213
Table 6.10 Descriptive Analysis for Elements of Engagement.....	215
Table 6.11 Observation of Dongba IME Experience.....	219



List of Figures

Figure 1.1. Consequence of Q4.....	8
Figure 1.2. Consequence of Q5.....	9
Figure 1.3. Consequence of Q7.....	9
Figure 1.4. Consequence of Q8.....	10
Figure 2.1. Google Arts & Culture: Face recognition	32
Figure 2.2. Google Arts & Culture: Face recognition	33
Figure 2.3. Digital Protection System of Intangible Cultural Heritage in Jiangsu Section of the Grand Canal	56
Figure 2.4. Conceptual model of digital museum 1	58
Figure 2.5. Conceptual model of digital museum 2.....	59
Figure 2.6. Conceptual model of digital museum 3.....	60
Figure 2.7. The Palace Museum "WeChat" applet.....	65
Figure 2.8. Research road map of this study	71
Figure 3.1. The Research Framework	83
Figure 3.2. The current Dongba Culture Museum	90
Figure 3.3. Naxi Genesis Exhibition Hall	92
Figure 3.4. The scene of Naxi's creation story	92
Figure 3.5. Summary chart of the keywords of the research on the participants' demand for the Dongba Culture Museum.....	103
Figure 3.6. Chart of Users' Demand Proportions for Dongba Culture Museum.....	103
Figure 3.7. Conceptual Model Design Drawing of Dongba Culture	106
Figure 3.8. Exhibition Hall Layout Guide Map	107
Figure 3.9. Inter map	108
Figure 3.10. Home design	110
Figure 3.11. Content pages	110
Figure 3.12. Exhibition Interactive Page	110
Figure 3.13. AR cultural tourism explores the Palace Museum.....	115
Figure 3.14. H5 production flow chart	123

Figure 4.1. A Conceptual model of Museum Interactive Exhibition for Intangible Dongba Cultural Heritage.....	134
Figure 4.2. The CVI ratings for Conceptual model of Museum Interactive Exhibition for Intangible Dongba Cultural Heritage Appreciation	141
Figure 4.3. The word cloud of expert opinion	156
Figure 4.4. A Conceptual model of Museum Interactive Exhibition for Intangible Dongba Cultural Heritage	163
Figure 5.1 Dongba script "mascot"Map	171
Figure 5.2 Exhibition Hall Layout Guide	171
Figure 5.3. The 3D model from (a) Top view, (b) Side view,(c)Front view,(d) Overall effect Dongba Culture Interactive Museum.....	172
Figure 5.4. Proposed layout design	173
Figure 5.5. Physical Exhibition Hall	174
Figure 5.6. Digital Interactive Exhibition Hall	175
Figure 5.7. Peripheral Product Sales Hall	176
Figure 5.8. Creative Arts Hall	177
Figure 5.9. Central Panorama Exhibition Hall	178
Figure 5.10. H5 prototype for IME mind map	179
Figure 5.11. Home design	180
Figure 5.12. Content pages	180
Figure 5.13. Exhibition Interactive Page	181
Figure 5.14. H5 interactive design.....	187
Figure 5.15. Effect of central VR hall	188
Figure 5.16. AR cultural tourism explores the Palace Museum.....	189
Figure 5.17. Effect of central AR hall	191
Figure 5.18. Effect of central AI hall	192
Figure 6.1. Conducting project tests at Lijiang Culture and Tourism College	201
Figure 6.2. Conducting project tests at Lijiang Dongba Culture Research Institute	201

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This study selects interactive museum as the focal point of its investigation, particularly focusing on the Dongba culture of Lijiang, China as a case study. It is imperative to delve into the emergence and progression of this culture to achieve a more profound understanding. Prior to embarking on an exhaustive and comprehensive exploration, it is important to conduct preliminary research on pertinent matters, significance, current research status, and proposed methodologies.

Firstly, the interactive museum outlined in this study represents a marriage of conventional physical museum with modern online museum. It utilises digital technology and the Internet to provide a dynamic digital showcase and interactive experience of museum artefacts. This innovative approach enables participants to engage with the rich interactive displays of a physical museum in a realistic and immersive manner, while also affording them the convenience of exploring and comprehending cultural heritage online. Additionally, the digital museum boasts features that promote global communication, interaction, and education.

Secondly, in the realm of human civilisation, cultural heritage holds immense significance and embodies our profound historical legacies, traditional practices, and artistic expressions. Among the diverse and vibrant cultural landscapes globally, the Dongba culture of Lijiang stands out as a repository of ancient wisdom and artistic magnificence. Nevertheless, like numerous other forms of intangible cultural heritage, the Dongba culture confronts challenges

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Appendix A

The questionnaire was designed as follows (a total of 126 valid questionnaires were returned as summarised below):

Q1. Do you know anything about Dongba culture?

A.Yes B.No

Q2. Have you ever visited a traditional Dongba culture museum or related exhibition?

A.Yes B.No

Q3. Do you support the digitisation of the Dongba Culture Museum?

A.Yes B.No C.Not sure

Q4. What do you think are the advantages of digitising the Museum of Dongba Culture?

(Please select all that apply)

A. Allows easy access and browsing of artefacts and exhibition

B. Provides more information and interpretation of exhibition

C. the ability to communicate and share with other users

D. Can provide more educational resources and learning opportunities

Other (please specify): _____

Q5. What features or experiences do you expect to have in the Digital Museum of Dongba Culture? (Please select all that apply)

A. Virtual Reality (VR) or Augmented Reality (AR) experiences

B. Interactive exhibition and games

C. Multilingual support

D. Personalised recommendations and guided tours

E. Opportunities for user engagement and content contribution

Other (please specify): _____

Q6. What educational resources do you think should be provided in a digital museum of Dongba culture? (Please select all that apply)

- A. Text narration and introduction
- B. Audio narration and guided tours
- C. Video presentations and lectures
- D. Interactive learning activities and games
- E. Online learning courses or resources

Other (please specify): _____

Q7. How do you think digital Dongba cultural museums should be integrated with social media and online communities?

- A. Allow users to share museum content and exhibition on social media
- B. Provide a platform for online community discussion and exchange
- C. Integrate social media elements such as liking, commenting and sharing

Other (please specify): _____

Q8. Any other suggestions or comments you would like to make about the Digital Museum of Dongba Culture?

Kindly take note that the aforementioned questionnaire serves merely as a template, and it is permissible for you to customise and tailor it according to your specific requirements. When crafting the questionnaire, it is imperative to guarantee that the questions are unambiguous, succinct, and accompanied by pertinent choices, thereby enabling the collection of pertinent feedback and observations.

So more and more people want to know about Dongba culture and want to visit the Dongba

Culture Museum, this study also hope to interact online and combine online and offline with each other to provide more entertainment.

Q1. Do you know anything about Dongba culture?

A.Yes B.No



Figure A.1. Consequence of Q1

Q2. Have you ever visited a traditional Dongba culture museum or related exhibition?

A.Yes B.No



Figure A.2. Consequence of Q2

Q3. Do you support the digitisation of the Dongba Culture Museum?

A.Yes B.No C.Not sure

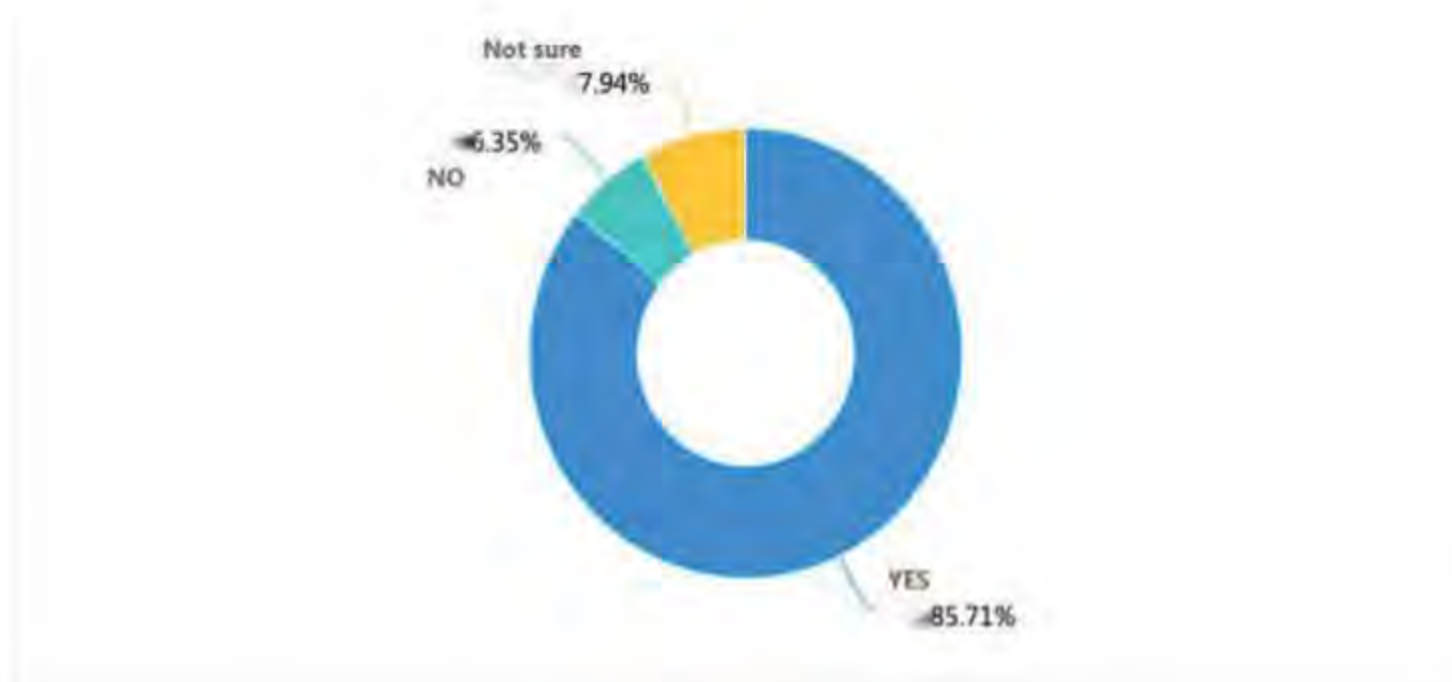


Figure A.3. Consequence of Q3

Q4. What do you think are the advantages of digitising the Museum of Dongba Culture?

(Please select all that apply)

A. Allows easy access and browsing of artefacts and exhibition

B. Provides more information and interpretation of exhibition

C. the ability to communicate and share with other users

D. Can provide more educational resources and learning opportunities

Other (please specify): _____

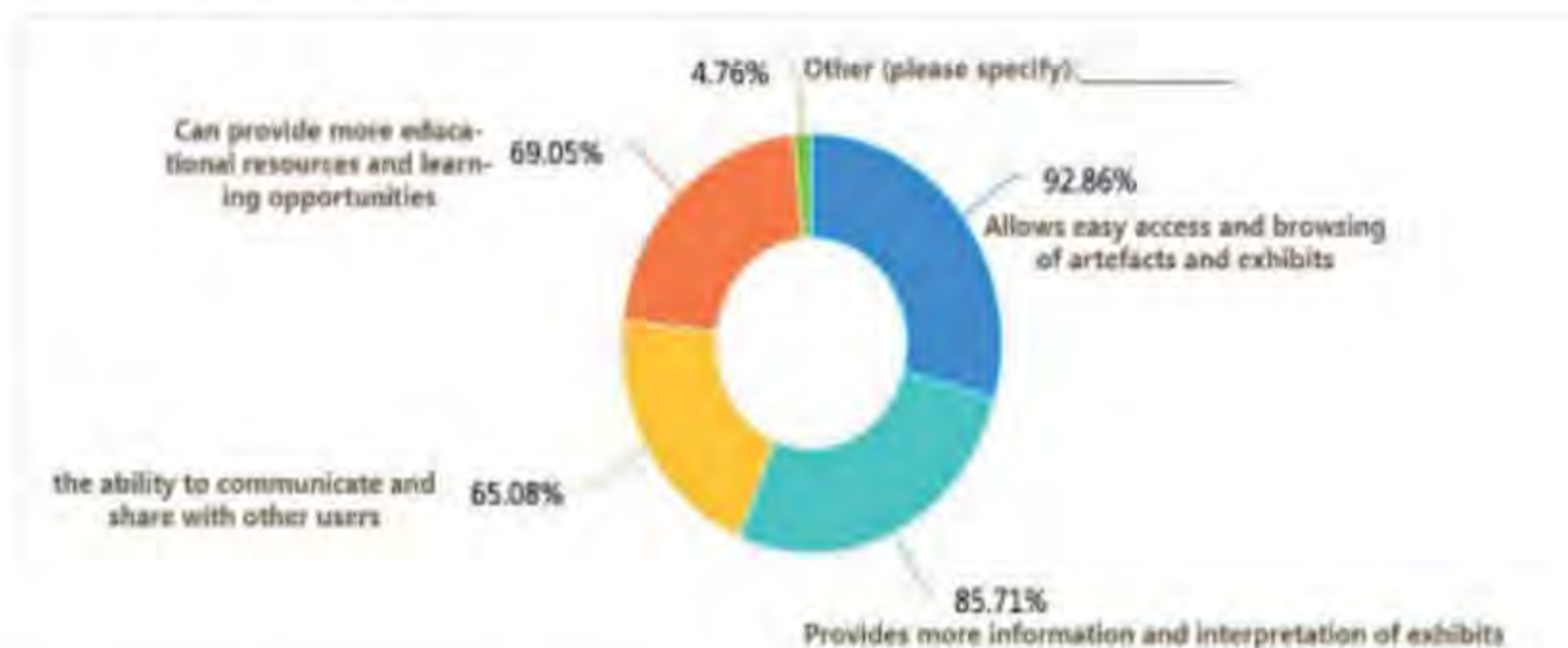


Figure A.4. Consequence of Q4

Q5. What features or experiences do you expect to have in the Digital Museum of Dongba Culture? (Please select all that apply)

- A. Virtual Reality (VR) or Augmented Reality (AR) experiences
- B. Interactive exhibition and games
- C. Multilingual support
- D. Personalised recommendations and guided tours
- E. Opportunities for user engagement and content contribution
- Other (please specify): _____

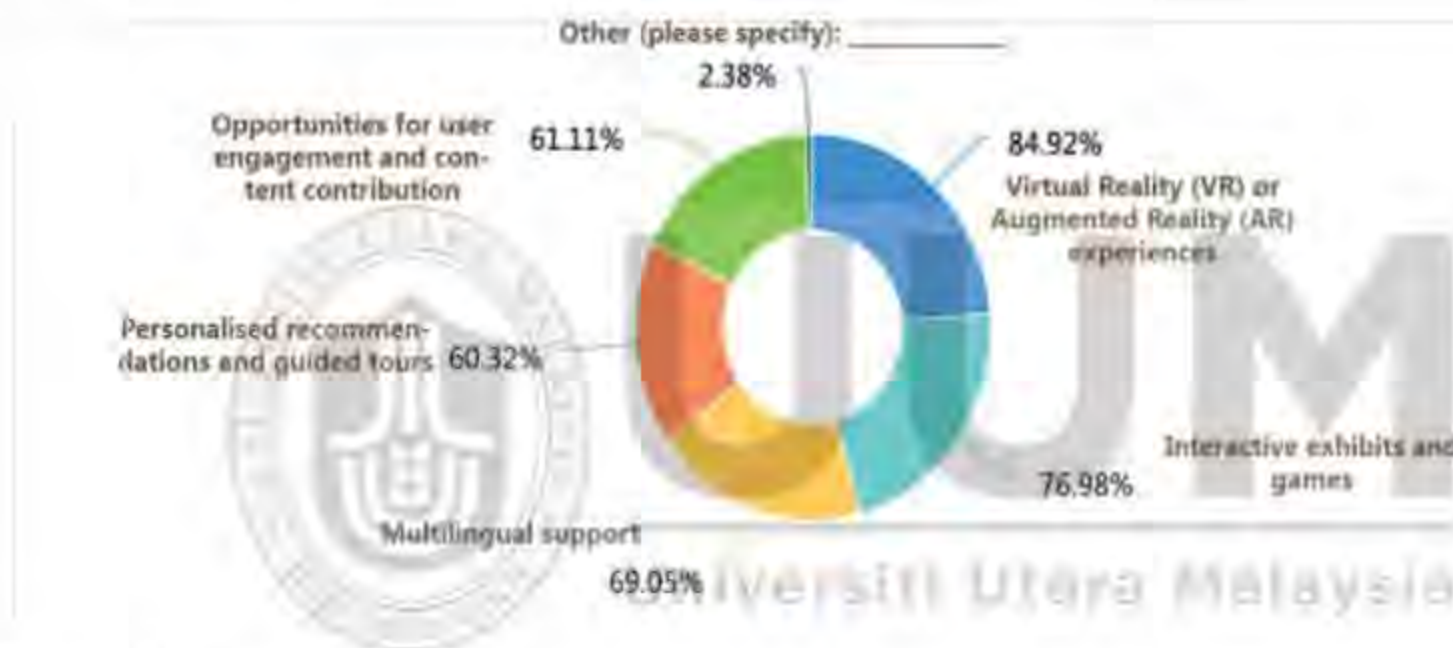


Figure A.5. Consequence of Q5

Q6. What educational resources do you think should be provided in a digital museum of Dongba culture? (Please select all that apply)

- A. Text narration and introduction
- B. Audio narration and guided tours
- C. Video presentations and lectures
- D. Interactive learning activities and games
- E. Online learning courses or resources
- Other (please specify): _____

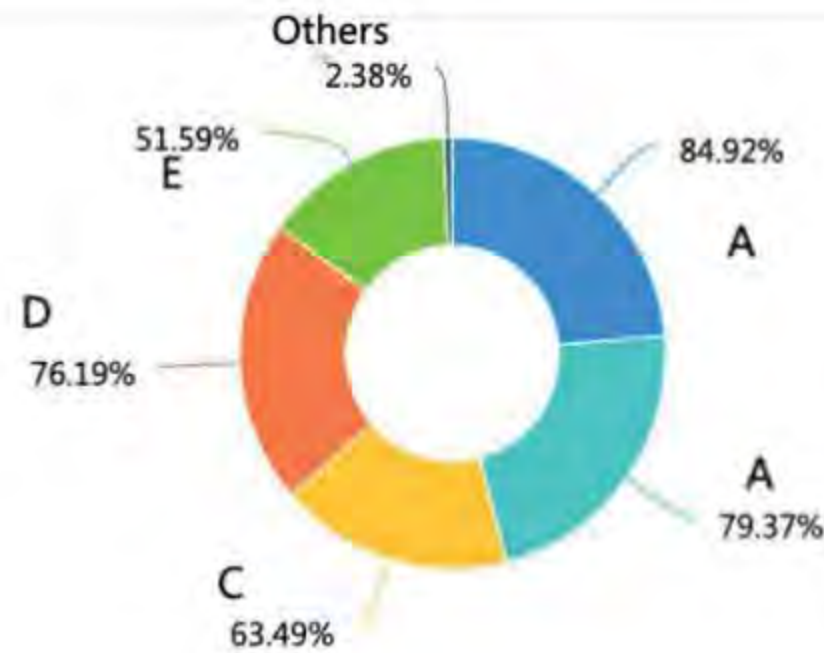


Figure A.6. Consequence of Q6

Q7. How do you think digital Dongba cultural museums should be integrated with social media and online communities?

A. Allow users to share museum content and exhibitions on social media

B. Provide a platform for online community discussion and exchange

C. Integrate social media elements such as liking, commenting and sharing

Other (please specify): _____

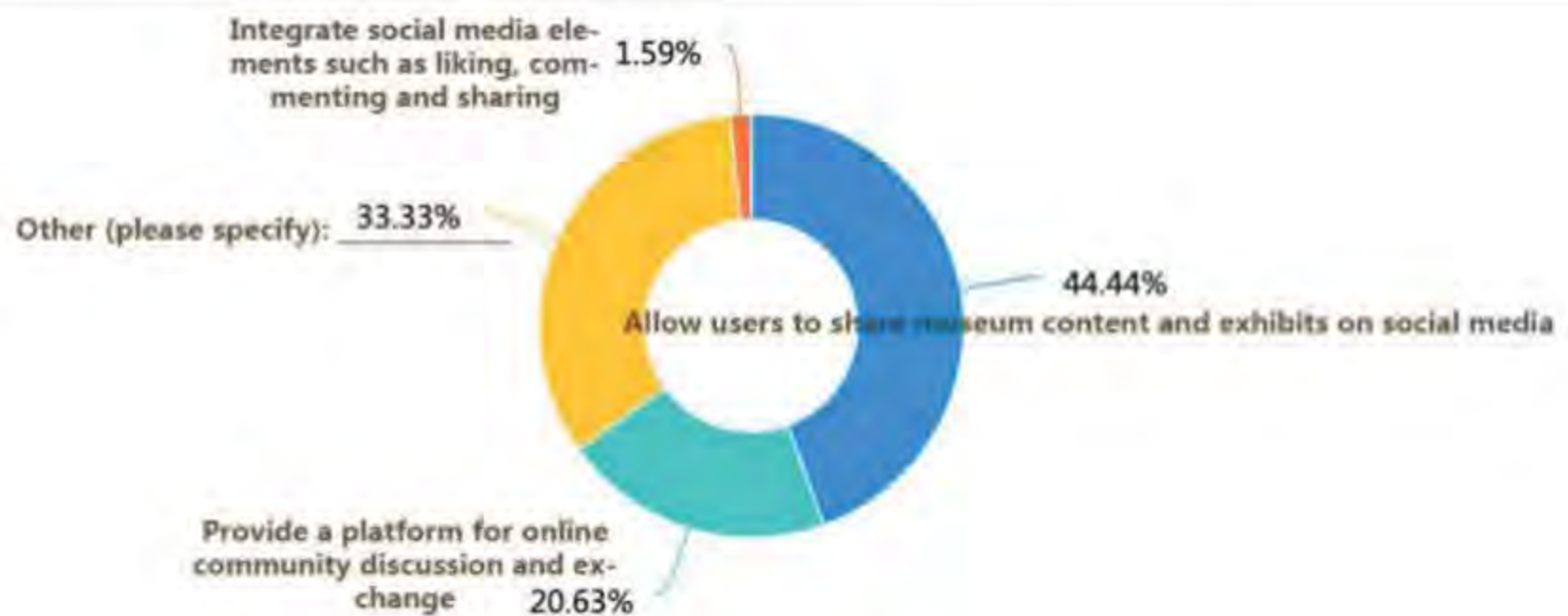


Figure A.7. Consequence of Q7

Q8. Any other suggestions or comments you would like to make about the Digital Museum of Dongba Culture?

Please note that the above is only a sample questionnaire and you may modify and adapt it to suit your needs. When designing the questionnaire, ensure that the questions are clear, concise and provide appropriate options in order to gather useful feedback and comments.

So more and more people want to know about Dongba culture and want to visit the Dongba Culture Museum, this study also hope to interact online and combine online and offline with each other to provide more entertainment.



Figure A.9. Consequence of Q8

So more and more people want to know about Dongba culture and want to visit the Dongba Culture Museum, this study also hope to interact online and combine online and offline with each other to provide more entertainment.

Appendix B

CONSENT FORM

A conceptual model of museum interactive exhibition for intangible Dongba cultural heritage.

This experiment will serve to validate the effectiveness of the conceptual model of museum interactive exhibition for intangible Dongba cultural heritage. During this study, you will be asked to complete some tasks as to discover how you learn using museum interactive exhibition. This experiment was designed to be approximately 35 minutes in length. However, if there are any tasks or questions you would rather not to answer or that you do not feel comfortable answering, please say so and we will stop the interview or move on to the next question, whichever you prefer.

This study employs 126 participants to undertake this experiment. The participants include college students in LiJiang province who are selected by purposive sampling.

All the information will be treated in the strictest confidence and the data will only be used for academic purposes.

Principal Investigator: _____

Participant's Agreement:

I am aware that my participation in this experiment and interview is voluntary. I understand the objectives of this research. If, for any reason, at any time, I wish to stop the experiment and interview, I may do so without having to give an explanation.

The researcher has reviewed the individual and social benefits of this project with me

The data gathered in this study are confidential with respect to my personal identity unless I specify otherwise. I understand if I say anything that I believe may incriminate myself the interviewer will immediately rewind the tape and record over the potentially incriminating information. If I have any questions about the study or this questionnaire, I am free to contact the researchers.

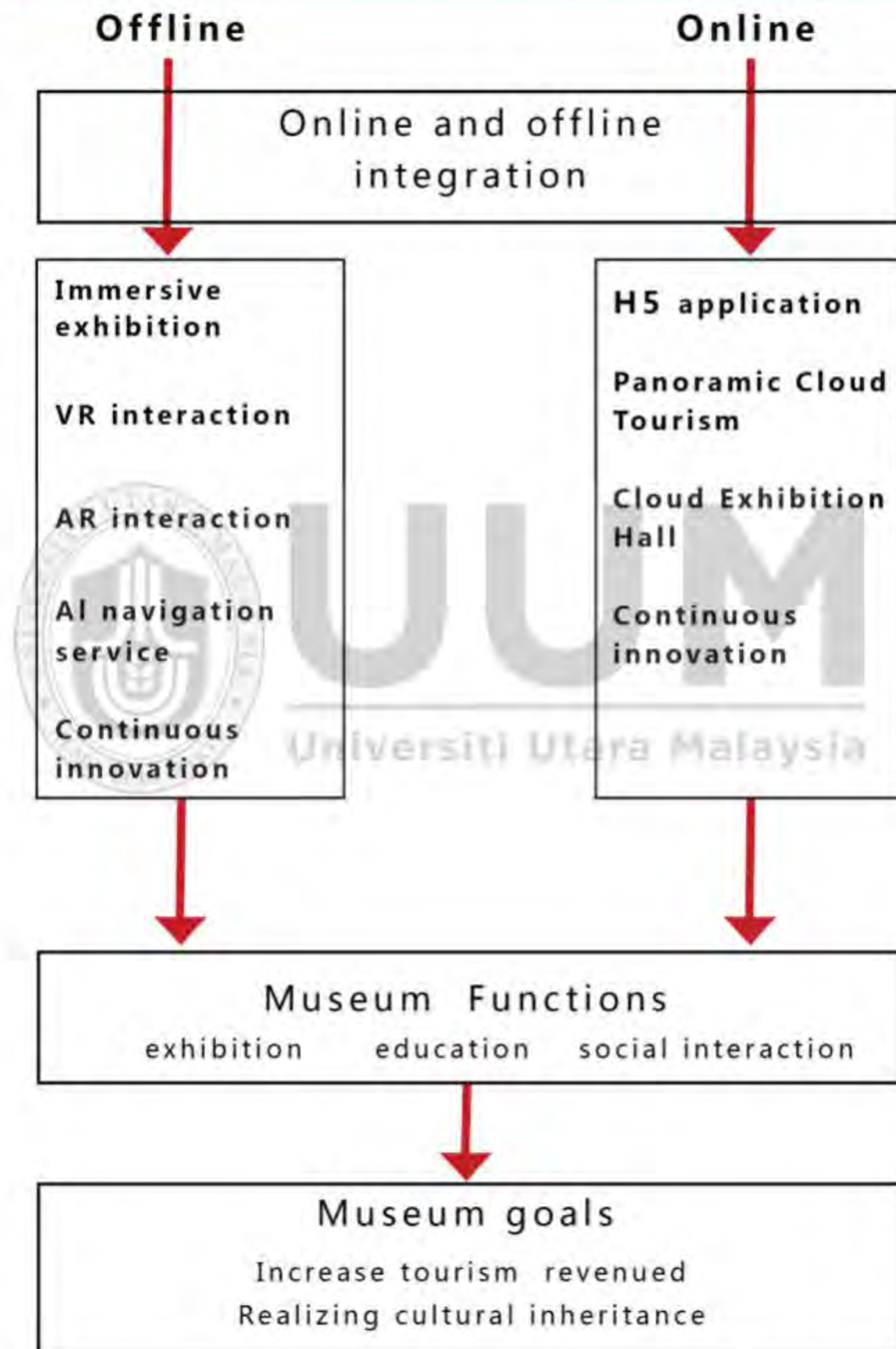
I have read this consent form and, with the understanding that I can withdraw at any time and for whatever reason, I agree to take part in this study.

Participant's Name _____

Participant's Signature _____

Date

Museum Interactive Exhibition for Intangible Dongba Cultural Heritage



A. Online + offline		Improvement in the definition (State if there are any)			
Interactive exhibition					
Definition Enhancing the visitor experience of interactive exhibitions through online and offline offers a new approach (Haugstvedt & Ludvigsen, 2022).					
Components		Definition	Essential	Slightly essential	Not essential
I	Offline				
1	Offline	Offline interactive multimedia technology can increase the fun and engagement of cultural displays through gamified elements and interactive experiences (Liu, 2020).	6	1	
2	Immersive exhibition	Enhancing visitor engagement and experience through technology and design (Johnson & Lee, 2022).	6	1	
3	VR	Emotional responses and immersive experiences in virtual reality, especially in games and simulations (Parsons & Rizzo, 2021).	5	2	
4	AR	AR technology is able to combine virtual information with the real environment to make cultural presentations more vivid and interactive (Wang, 2021).	5	1	1
5	AI	The AI navigation system can provide personalised guided tours to enhance visitors' experience and satisfaction (Li, 2020).	5		2
II	Online				
1	Online	Online museums can break through time and geographical limitations, enabling global audiences to access and learn about cultural heritage anytime (Li, 2020).	5	2	
2	H5	H5 often referred to as HTML5, introduces a number of new features and APIs designed to improve the functionality and performance of web applications while providing richer multimedia support and more powerful interactive capabilities (Liu & Wu, 2020).	4	3	
3	Panoramic cloud tourism	The potential of panoramic cloud tourism in remote cultural sites,			

		its role in cultural preservation and promotion, and its revolutionary impact on the tourist experience (Chen & Li, 2021).	5	2	
4	Cloud exhibition	Expanding the functionality and reach of traditional museums by enabling the presentation and management of virtual museums through cloud computing, The museum experience has been transformed through digital technology (Wang & Liu, 2022).	5	2	
In what other ways do you think technology can enhance the user experience at the Dongba Culture Museum?					
<p>AI</p> <p>Rich and easy to understand the Dongba culture content.</p> <p>Some more participatory and experiential content</p> <p>Make more rituals.</p> <p>All technologies need to be simple and operable, and the operation process should not be too complex, increasing the difficulty of experience and the cost of later personnel maintenance.</p> <p>The deep excavation of folk culture can realize the cognitive promotion of folk culture. Publish applicable books and videos related to folk culture, animation, and divination. Cooperate with remote intangible cultural heritage, museums and other institutions to achieve communication exposure.</p> <p>Different sacrificial activity scenes are designed to give online users different experiences, so as to systematically display the atmosphere of the Dongba sacrificial ceremony and enrich the experience.</p>					
B. Museum functions		Improvement in the definition (State if there are any)			
Definition					
Museums can fulfil their educational, community engagement and economic development functions. The function of museums as a platform for cultural exchange in the process of globalisation, analysing their role in promoting cross-cultural understanding (Zhang& Chen, 2021).					
Components		Essential	Slightly essential	Not essential	
I	Exhibition				
Definition		An activity or place where something is organised, planned and systematically displayed for public viewing and learningHow interactive exhibitions can engage audiences and improve exhibition effectiveness through participatory design (Martin & Gonzalez, 2021).			
1	Interactive exhibitions provide me with a lively learning environment.	5	2		
2	Exhibit help to appreciate cultural exchange.	6	1		
3	Use the exhibition increases my engagement and helps to deepen my understanding and feelings about the content of the display.	5	2		

4	Use exhibition can help me understand the Dongba culture.	6	1	
5	Use exhibition makes it easy for me to know the history of the culture.	5	2	
6	Use exhibition can urge me to repeat my visit.	4	3	
7	The exhibition can stimulate my and imagination about the Dongba culture.	2	5	
II	Education			
Definition		The Role of Museum Education in Community Engagement, Promoting Community Inclusion and Social Interaction through Educational Activities (Carter & Davis, 2020).		
1	The museum enables me to accomplish my Dongba culture learning greatly.	4	3	
2	The museum increases my understanding and learning in the areas of Dongba history, culture, and technology.	4	2	1
3	The museum promotes my participation in Dongba cultural activities through educational programmes and community events.	3	4	
4	The museum Deepen my emotional connection to art and culture through first-hand experience and feelings.	4	3	
5	The museum provides me with the opportunity to learn and experience the culture in depth.	4	3	
III	Social interaction			
Definition		Museums serve as social spaces that promote interaction and communication between visitors, Promote audience learning and engagement through a combination of digital and physical (White& Brown, 2022).		
1	Using museum exhibition allows me to better interact and exchange culture with others.	4	3	
2	The museum exhibition taught me that it is important to preserve cultural heritage.	4	3	
3	The museum enhances my sense of identity and pride in Dongba culture by sharing with my friends online.	3	4	
4	Online and offline events help me to engage other visitors.	3	4	
5	Online and offline activities make me curious to communicate with others.	3	4	
Please provide suggestion(s) in describing the museum functions.				
<p>The digital function of the museum can cross the boundaries of time, place and space, and help the audience to establish complete and equal viewing conditions.</p> <p>Educational research and exchange not have</p> <p>Science science, products need to be excavated</p> <p>In the Internet era, in addition to online and offline museums, there should also be substantial museums</p> <p>Let more future generations know the contributions of their predecessors</p> <p>In addition to the cultural exhibition, we should also strengthen the research and development and sales of cultural and creative products, coordinate the "organic combination of exhibition and sales", to maximise the development interests of museums.</p>				

C. Museum goals				
Components		Essential	Slightly essential	Not essential
I	Increase tourism revenue			
Definition		The contribution of museums to regional tourism development explores how museums can contribute to the local economy by increasing visitor traffic (Nguyen& Lee, 2020).		
1	The exhibition design and interactive experience made me want to go back multiple times.	2	5	
2	The different technology can be worthwhile for me to experience multiple times.	3	4	
3	I love buying museum after encountered interactive exhibition.	1	5	
4	The museum exhibition is also a big draw for me to go there.	3	4	
5	The smart service made my experience better.	4	3	
6	The museum hosts online and offline exhibitions that I enjoy attending.	4	3	
II	Realising Cultural Inheritance			
Definition		Museums achieve the preservation and transmission of cultural heritage through exhibitions, storytelling and presentation, exploring the multiple layers of museum display and cultural expression (Macdonald, 2020).		
1	The museum effectively showed me the intangible heritage of the Dongba culture through interactive exhibitions and collections.	4	3	
2	The museum taught me and studied Dongba culture through interactive exhibitions, lectures, seminars and other educational activities.	5	2	
3	Local communities and cultural organisations show me the lifestyle and values of the Dongba culture through interactive exhibitions.	4	3	
4	Dongba culture is presented to us, extending the influence and sustainability of the heritage, using state-of-the-art technology for interactive exhibition.	5	2	
5	It made me feel proud, when I see a lot of people using interactive exhibition to learn about Dongba culture.	4	3	
If there are any missing items describing the museum goals, please give a suggestion.				
<p>In the original exhibition design, and then superimposed 5D holographic projection equipment, the experience will be more immersive.</p> <p>In the display of content, culture and art are combined, and pictures and pictures complement each other.</p> <p>The construction of the site needs to be spent heavily to ensure the throughput and adaptation space of the museum</p> <p>Add content that is acceptable to the young, and get more young generation involved.</p> <p>Early to ask our eldest brother and long red to build up the Dongba shop!</p>				

Appendix C

SECTION I: PARTICIPANTS' BACKGROUND

Please tick (✓) in the appropriate box.

1. Gender:

Male ☐

Female ☐

2. Age:

<20 years ☐

21-29 years ☐

30-39 years ☐

40-49 years ☐

over 50 years ☐

3. Your Experience with Mobile Applications:

One year or less ☐

More than one year ☐

SECTION II: ELEMENTS OF ENGAGEMENT

Please indicate your degree of agreement on the following statement by circling the most appropriate choice using the scale below:

1	2	3	4	5
Strongly	Disagree	Neutral	Agree	Strongly
Disagree				Agree

AESTHETICS

Aesthetics refers to visual beauty or the study of natural and appealing mobile environments. This section aims to understand the aesthetics of the Dongba IME.

Items Scale					
1.	The Dongba IME is attractive.	1	2	3	4 5
2.	The Dongba IME is appealing to my visual senses.	1	2	3	4 5
3.	The Dongba IME screen layout is suitable.	1	2	3	4 5

USABILITY

This step validates the application of selected technologies (e.g., VR, AR, H5) in real scenarios, assessing their stability and response speed. It helps identify potential technical issues, allowing for adjustments and optimisations before formal implementation.

Items Scale					
1.	The Dongba IME was easy to use.	1	2	3	4 5
2.	The Dongba IME overall effect of these technologies in the exhibition was very good.	1	2	3	4 5
3.	The Dongba IME can be easily updated.	1	2	3	4 5

INTERACTIVE

By involving actual users in the pilot test, feedback on exhibition content, layout design, and interactive methods is collected. This helps evaluate audience engagement and satisfaction and allows for improvements based on the feedback.

Items Scale					
1.	The Dongba IME content of this exhibition is better.	1	2	3	4 5
2.	The Dongba IME layout design is reasonable.	1	2	3	4 5
3.	The Dongba IME interactive methods are easy to use.	1	2	3	4 5

EDUCATION

This evaluates whether the exhibition content can effectively convey cultural information, capture the audience's attention, and achieve the exhibition's educational goals.

Items Scale					
1. The Dongba IME exhibition content effectively convey cultural information.	1	2	3	4	5
2. The Dongba IME exhibition captures your attention.	1	2	3	4	5
3. The Dongba IME exhibition achieves its educational goals	1	2	3	4	5

SATISFACTION

Satisfaction refers to the act of being content and fond with an app. This section aims to understand the satisfaction after using the IME app.

Items Scale					
1. Generally, I am satisfied with the Dongba IME.	1	2	3	4	5
2. The Dongba IME provided me with enough information to understand the exhibition content.	1	2	3	4	5
3. I will recommend the Dongba IME to others.	1	2	3	4	5

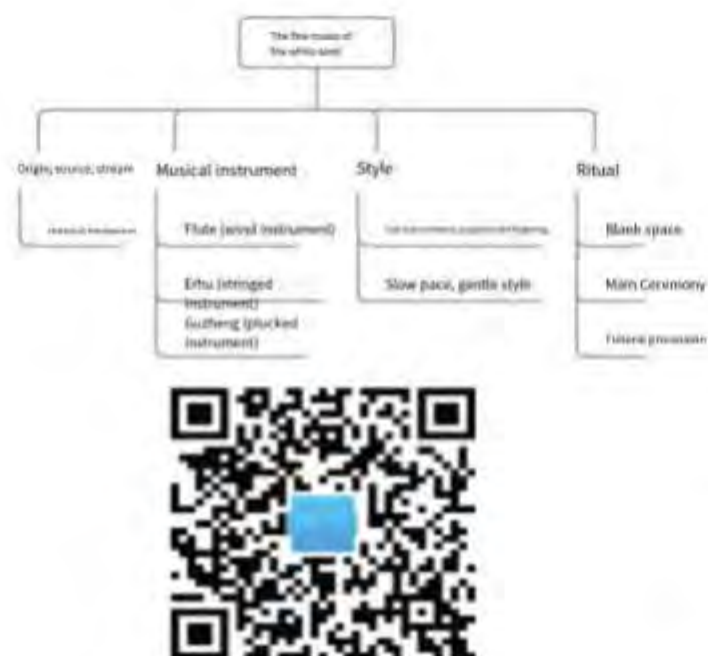
ENJOYMENT

Enjoyment refers to the user experiencing fun, enjoy, and entertainment with the usage of the app. This section aims to understand the enjoyment while using the Dongba IME.

Items Scale					
1. I enjoyed visit the Dongba IME.	1	2	3	4	5
2. The atmosphere of the Dongba IME enhances my entertainment experience.	1	2	3	4	5
3. It was fun using the Dongba IME.	1	2	3	4	5
4. I did not feel the time has passed Dongba IME while using.	1	2	3	4	5

Appendix D

There are some H5 cases of Dongba culture that were created in the preliminary stage of this study.



作品二维码链接



H5 | "The Naxi People Who Work Under the Stars and Over the Moon"

Play Dream 2021-12-31 11:56



《木府风云h5》作品二维码



QR code of H5 works related to Dongba culture

Universiti Utara Malaysia

List of Publications

- Yang, W. (2021). The Composition of Dongba Characters Interpreted by Multimedia Interactive Design. Art Panorama.
- Yang, W. (2022). Conceptual Design of the Digital Village Museum of Dongba Culture in Lijiang — Taking Dadong Township in Lijiang as an Example. Chinese National Art.
- Yang, W. (2022). The Application and Research of Dongba Culture in the New Media Era. Chinese Artists.
- Yang, W. (2023). Design Scheme of the "Fuying Mosuo" Series of Landscape Art Installations. Shanghai Textile Science & Technology.
- Yang, W. & Abu Bakar, J. A. A. (2024). Teaching research on H5 application of digital publishing of Dongba culture. Pakistan Journal of Life and Social Sciences, 22.