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Beyond Exhibits: Exploring Museum VR Adoption through a Validated UTAUT2 Model for Visitor Usage Behaviour

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ABSTRACT

This study examines the Unified Theory of Acceptance and Use of Technology (UTAUT2) model's suitability for understanding museum visitors' intentions towards Virtual Reality (VR) technology. Compared to the Technology Acceptance Model (TAM), UTAUT2 offers a more comprehensive framework. The study validates its relevance to the museum context and extends it with factors such as design quality and past experience. A questionnaire based on this extended model was developed and validated with 78 participants. The results confirm the model's effectiveness and reliability, suggesting its potential for studying VR intentions in museums. This validated model lays the groundwork for future large-scale studies exploring generational differences in VR usage through age-segmented data analysis. Understanding these variations can inform the development of VR experiences tailored to specific age groups, ultimately enhancing the museum experience.

Keywords: behavioural intention, museum VR, UTAUT2 model, Guangdong Regional Museum

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1 INTRODUCTION

Museums, pillars of every nation, serve as invaluable repositories and conveyors of history and culture. The global museum landscape reflects diverse influences shaped by history, culture, social environment, policy, and economy (Harvey & Mahard, 2020). The steady rise in the number and type of museums contributes to cultural exchange, tourism promotion, and economic development (Qizi, 2021). This trend is evident in China, with the number of museums reaching 6565 in 2022 (Zhang & Yu, 2023), reflecting the nation's rich cultural heritage and commitment to museum development.

Museum development constantly evolves, prompting museum professionals to explore innovative approaches. This extends beyond prioritising audience engagement. Museums increasingly collaborate with advanced digital technologies to enhance exhibition formats and engagement methods (Fleming, 2019). In the era of rapid technological advancement, national governments and museum professionals are eager to leverage cutting-edge Virtual Reality (VR) technology to bridge the gap between traditional culture and the modern world. Chinese museums are actively embracing VR technology to provide richer and more vivid exhibition experiences. Recognising the explosive growth of China's VR industry, the government released the "2022-2026" Action Plan for VR and Industry Integration" in December 2022. This initiative signifies significant government investment in applying VR technology to cultural tourism. By urging museums and cultural exhibition halls to develop VR digital experience products, the plan allows for the revitalisation of excellent cultural content through VR technology, offering visitors innovative ways to engage (Zhao et al., 2019). However, despite the potential VR technology presents for Chinese museums, various difficulties and challenges remain,

1.1 Understanding Visitor Behaviour Towards VR in Guangdong

Guangdong Province, China's economic powerhouse, boasts a rich cultural heritage reflected in its museums. These museums house artefacts representing diverse regional cultures like Cantonese, Hakka, and Chaozhou. Notably, the prevalence of Cantonese dialects sets Guangdong museums apart from those in other provinces. While the local government actively supports digital exploration in museums, challenges persist across the planning, testing, and operation stages of VR exhibitions (Ch'ng et al., 2019). During the planning stage, museum staff often struggle to find suitable VR equipment, determine placement locations, and select display methods, leading to delays (Zhang & Francis, 2024). The testing phase typically overlooks visitor engagement, focusing on hardware functionality and interface presentation rather than visitor preferences and participation (Su et al., 2020). Operational challenges include low usage rates of short-term prototypes due to operational difficulties or unsatisfactory content and the closure of long-term exhibitions due to complexity, duration, or dull content (Ch'ng et al., 2019).

1.2 Addressing The Gap: The Research Focus

However, effectively implementing VR technology requires understanding the Guangdong region's visitor needs and behavioural intentions. As public spaces, museums cater to a diverse

audience with varying cultural backgrounds, interests, and cognitive abilities (Walhimer, 2021; Liu, 2020). Unfortunately, current research in Guangdong museums lacks long-term observations on user behaviour, hindering the capture of evolving user preferences (Li et al., 2023).

Traditional data collection methods, like paper surveys and website messages, often yield limited data that fails to capture visitor behaviour and intentions towards VR technology (Zhuang et al., 2021). Additionally, the absence of effective data analysis systems hinders the integration and interpretation of collected data (Xu et al., 2019).

The Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) models have been instrumental in studying user behaviour towards new technologies (Nizar et al., 2018). However, these models require adjustments to account for the diverse VR products offered by different museums in various regions (Cheng et al., 2023; Dwivedi et al., 2019). A lack of knowledge and proficiency in applying these models further restricts their utilisation by Chinese museum researchers (Luo & Ye, 2020). Hence, with its potential to enhance the understanding and application of these models, this research is poised to significantly impact technology acceptance and museum studies.

This study aims to address these limitations. This research explores the feasibility of using the UTAUT2 model to investigate the behavioural intentions of Guangdong Museum visitors towards VR technology. Subsequently, this research expands the UTAUT2 model variables to suit this specific context better and validates the effectiveness and reliability of this extended model. This research will answer the following questions:

1. Is the UTAUT2 model suitable for studying the behavioural intentions of museum visitors in the Guangdong region towards VR technology?
2. How should the variables of the extended UTAUT2 model be set?
3. How effective and reliable is the extended UTAUT2 model proposed in this study?

1.3 Significance of The Study

This study delves into the behavioural intentions of museum visitors in Guangdong towards VR technology. The well-established UTAUT2 model serves as the theoretical framework, offering a comprehensive approach by considering the technology and social and personal factors influencing visitor behaviour. This choice surpasses simpler models like TAM, providing a more nuanced understanding of user acceptance in complex environments like museums.

The research methods encompass the chosen theoretical model, data collection methods, and data analysis techniques. This detailed approach empowers relevant researchers and museum staff to systematically collect user feedback data through validated methods (e.g., surveys) and identify key influencing factors on visitor intentions towards VR technology through the UTAUT2 lens. This knowledge is crucial for developing successful VR experiences within museums.

The significance of this study extends beyond the immediate research setting. It offers valuable contributions on two key levels. Firstly, it addresses a critical knowledge gap by investigating visitor behaviour towards VR technology, specifically in Guangdong museums. Additionally, by extending the UTAUT2 model with additional variables relevant to the museum VR experience, this research enhances the theoretical framework for studying such behaviour across museums. Secondly, the validated model, questionnaire design, data collection methods, and analysis techniques provide practical solutions for museums. This standardised approach empowers museum professionals to systematically gather user feedback on VR experiences, gain deeper insights into visitor needs and preferences regarding VR technology through UTAUT2 analysis, and ultimately develop more engaging VR exhibitions that cater to their visitors' specific interests and intentions.

The significance of this study extends beyond the immediate research setting. It fills a critical knowledge gap by investigating visitor behaviour towards VR technology in Guangdong museums and enhances the theoretical framework for studying such behaviour across museums by expanding the UTAUT2 model. This approach has the potential to significantly influence future research in similar settings, making it a valuable reference point.

Furthermore, the study offers practical solutions for museum professionals. The proposed model, questionnaire design, data collection methods, and analysis techniques can be directly implemented to systematically gather user feedback, understand visitor needs, and develop more visitor-centred and engaging VR exhibitions.

2 THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1 Theoretical Framework and Extended UTAUT2 Model

This section explores the theoretical models used to understand museum visitor behaviour towards VR technology. Most studies rely on psychological models, sometimes incorporating concepts from other disciplines. A review by Li and Othman (2024) found that nearly 40% of such studies employed the Technology Acceptance Model (TAM). However, researchers often expanded the TAM's two-variable structure by adding factors, placing strain on the original model.

This study utilises the UTAUT2 model, an evolution of TAM proposed by Venkatesh et al. (2012) (See Figure 1). The UTAUT2 model integrates TAM concepts like perceived usefulness and perceived ease of use into variables like performance expectancy and effort expectancy (Abbad, 2021). The UTAUT2 model boasts enhanced predictive power and has been empirically validated, explaining over 70% of the variance in user behaviour (Eneizan et al., 2019). Its focus on user intentions towards new technologies makes it ideal for studying VR adoption among museum visitors. This study builds upon the UTAUT2 model by tailoring it to the specific research context.

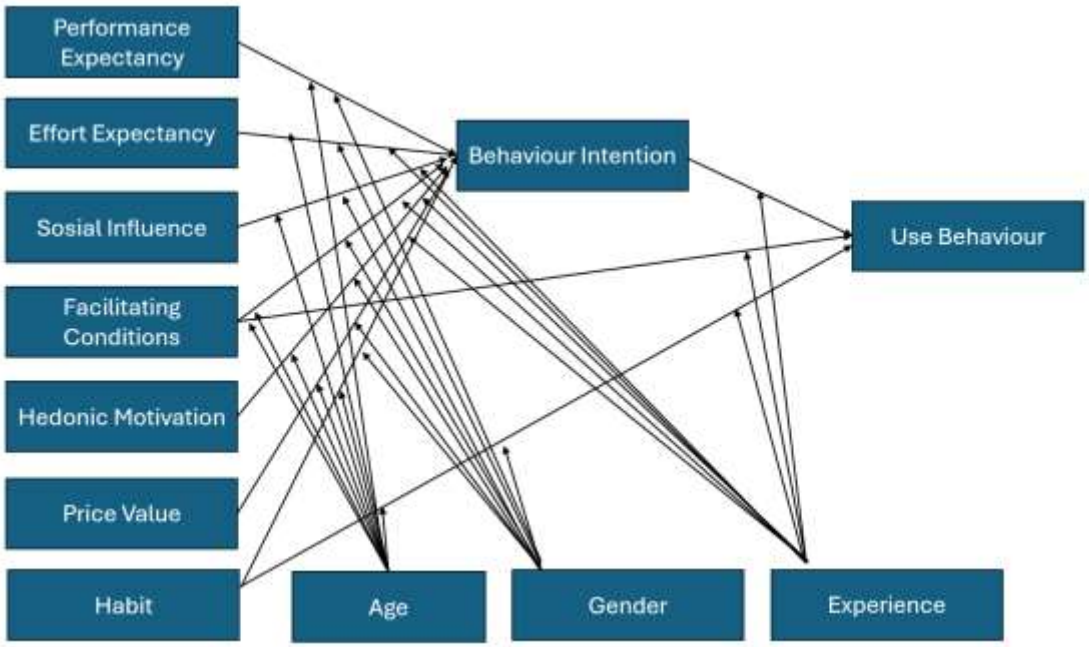

Figure 1. Unified Theory of Acceptance and Use of Technology2 (Venkatesh et al., 2012).

2.2 Key Factors Influencing Museum Visitors' Behavioural Intentions to Use VR

Reviewing existing literature gives insights into the factors influencing visitor behaviour toward VR technology. These factors will be considered for inclusion or exclusion in the extended model. According to Li and Othman (2024), several key factors emerge alongside the core UTAUT2 variables. Visitor acceptance of VR technology in museums hinges on several factors. First, visitors need to believe VR enhances their experience, fosters emotional connections, or improves understanding of the exhibits (perceived usefulness) (Wu et al., 2022). Second, intuitive interfaces, accessibility for all ages, and readily available technical support are crucial for perceived ease of use and encouraging engagement (Shehade & Stylianou-Lambert, 2020; Jiang et al., 2022). Social influence also plays a role, with positive experiences from others, positive reviews, or peer recommendations significantly influencing participation (Elgammal et al., 2020; Wang et al., 2019). Beyond that, both the content and interface quality matter. Visitors value VR experiences that offer accurate and rich information alongside intuitive interfaces and clear guidance (Elgammal et al., 2020; Wang et al., 2019). Finally, system quality – reliable hardware, robust software performance, and minimal technical glitches – contributes to a positive experience and influences engagement (Elgammal et al., 2020; Wang et al., 2019

2.3 Building the Extended UTAUT2 Model

The present study tailors the traditional UTAUT2 model by modifying independent and moderator variables. The core variables retained include performance expectation, effort expectation, social influence, and hedonic motivation. These variables are crucial for examining visitor intentions

towards VR technology and have been emphasised in previous research. Additionally, the recurring themes of system quality and information quality in the literature are consolidated into a new variable—design quality. This encompasses the device environment, hardware support, product interface, and script content (see Figure 2).

Based on existing literature, the extended model incorporates perceived risk as a core variable due to its potential impact on user behaviour. Past experience replaces Habit, reflecting the influence of a user's VR education level on behavioural intention, not formal education but exposure to VR training or experiences. Price Value is deemed inapplicable as this study focuses on publicly accessible museum VR experiences with minimal cost considerations.

The conventional moderator set of gender, age, experience, and voluntariness is revised. Gender is excluded as it lacks moderating influence on visitor VR usage. The gender ratio and identity do not significantly affect behavioural intentions. Voluntariness, referring to the freedom to adopt a technology, is excluded as our study does not enforce VR usage, giving visitors a complete choice. Finally, experience overlaps with past experience, introducing redundancy and leading to its exclusion.

The final extended model encompasses seven independent variables: Performance Expectancy (PE), Effort Expectancy (XX), Social Influence (SI), Hedonic Motivation (HM), Design Quality (DQ), Past Experience (PEx), and Perceived Risk (PR). Age Remains The Sole Moderator Variable. These seven factors comprehensively cover individual internal factors, external influences, device quality, and usage experience. The present study proposes that these variables collectively explain museum visitors' behavioural intentions towards VR technology. The subsequent chapter will define research methodologies and analytical tools based on the extended model's attributes, research questions, and objectives.

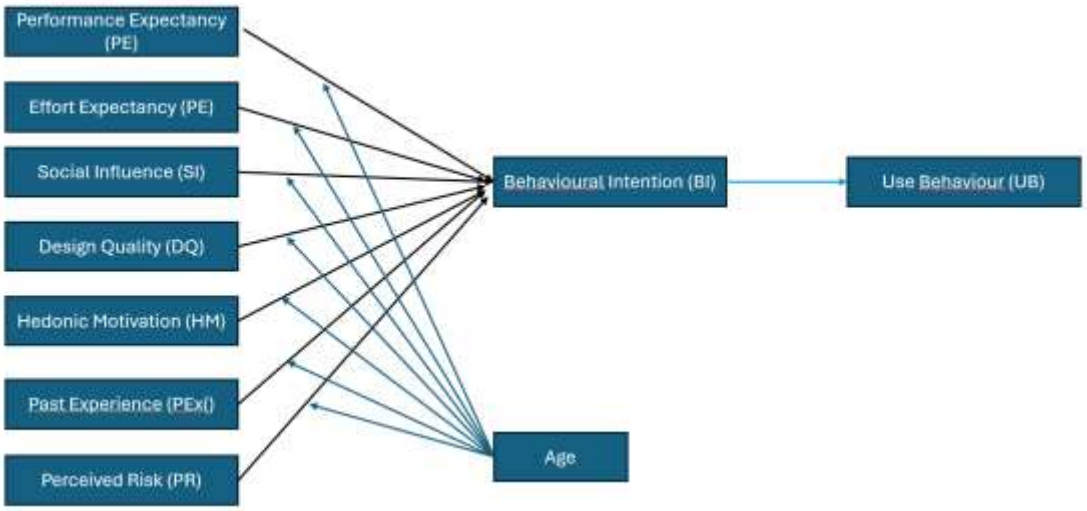

Figure 2. Extended UTAUT2 model for museum visitor behaviour and VR technology.

3 METHODS

3.1 Research Design

This research adopts a quantitative approach, aligning with the majority of previous studies in this field. While some studies have utilised qualitative methods like interviews (Shehade, 2020) and case studies (Durmus, 2023), these approaches are less suited to our research objectives. The extended UTAUT2 model relies on a large amount of data for effective and accurate validation. Therefore, a survey-based data collection method is most suitable for gathering a large sample size for analysis.

3.2 Questionnaire Design

This study was conducted to develop and validate a 28-item questionnaire based on the extended UTAUT2 model. The extended UTAUT2 model included the core constructs of performance expectancy, effort expectancy, and social influence. Additionally, the model was expanded to incorporate design quality, past experience, and perceived risk. For details on the specific questionnaire, please refer to Appendix A.

The questionnaire items were carefully crafted to measure the constructs of interest. The questionnaire is titled "Questionnaire on Behavioural Intentions of Museum Visitors about VR Technology Utilisation." The introduction section explains the purpose of the study, the researcher's identity, and the scoring method. Before responding, participants will receive an informed consent form and a verbal explanation of the study content.

The questionnaire is divided into two parts. The first part, Demographics, gathers basic information about the respondents, such as their age, gender, and how long they have been using VR technology. The second part, the Core Survey, focuses on variables from the extended UTAUT2 model. This section is divided into eight groups of questions, each corresponding to one of the model's seven independent variables and one moderating variable. All questions use a five-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5) to allow for nuanced responses. Only completed questionnaires were included in the analysis to ensure data accuracy.

3.3 Data Collection and Analysis

A convenience sample of 78 participants was recruited for this study. The data collection process involved distributing paper-based questionnaires to museum visitors in Guangdong. The primary objective of this pilot study was to assess the reliability and validity of the newly developed questionnaire. Exploratory factor analysis (EFA) was employed to achieve this. EFA is a statistical technique that helps identify underlying factors (latent constructs) that explain the relationships between observed variables (questionnaire items). In this context, EFA evaluated whether the questionnaire items grouped as intended based on the constructs within the extended UTAUT2 model. This analysis contributes to establishing the construct validity of the questionnaire, ensuring it measures the intended concepts. The EFA results (including details like KMO and

Bartlett's test statistics) can be presented in a separate table (refer to section 4.2), allowing readers to assess the data's suitability for factor analysis.

4 RESULTS

4.1 Descriptive Statistical Analysis of the Sample

A series of calculations, including reliability and validity tests, are performed to assess the questionnaire's effectiveness. Based on the results, refinements can be made to ensure data accuracy and model effectiveness.

The primary research site, the Guangdong Maritime Silk Road Museum, features VR exhibitions and attracts visitors across various age groups, aligning with the target population. A total of 78 questionnaires were collected. Table 1 summarises the preliminary data's descriptive statistics.

Table 1. Results of descriptive statistics.

Sample statistical characteristics	Classification	Frequency	Percentage
Gen	X（1965-1979）	26	33.3
	Y（1980-1994）	28	35.9
	Z（1995-2004）	24	30.8
Gender	Male	43	55.1
	Female	35	44.9
VR takes time	1-5 minutes	32	41
	5-10 minutes	29	37.2
	More than 10 minutes	17	21.8

4.2 Instrument Validity and Reliability

The initial assessment of the questionnaire's reliability using Cronbach's Alpha coefficient revealed that some sections needed improvement. As shown in Table 2 (details not explicitly mentioned here but can be found in the referenced table), specifically, the Design Quality (DQ) section had a coefficient below the recommended threshold of 0.7, indicating lower reliability. Further analysis using Corrected Item-Total Correlation (CITC) helped pinpoint question DQ4 within the DQ section as a weak link. This is because DQ4 had a CITC value significantly lower than 0.4, signifying a weak correlation with the other Design Quality items. Similarly, other sections, like Usage Behaviour (UB), showed lower reliability based on the Alpha coefficient.

Following this identification of problematic questions, DQ4 and UB3 (identified through a similar process based on CITC values in Table 2) were removed from the questionnaire. This revision aimed to enhance the questionnaire's internal consistency by removing items not strongly aligned with their respective sections.

Table 2. Summary of reliability analysis for the small sample scale questionnaire.

	CITC value	Alpha if Item Deleted	Cronbach's Alpha
PE1	0.771	0.866	
PE2	0.799	0.844	0.894
PE3	0.809	0.835	
EE1	0.771	0.819	
EE2	0.776	0.814	0.877
EE3	0.742	0.845	
DQ1	0.673	0.394	
DQ2	0.55	0.480	0.641
DQ3	0.657	0.405	
DQ4	-0.003	0.866	
SI1	0.816	0.835	
SI2	0.759	0.886	0.895
SI3	0.814	0.834	
HM1	0.795	0.843	
HM2	0.766	0.869	0.893
HM3	0.81	0.831	
PEx1	0.796	0.842	
PEx2	0.796	0.830	0.889
PEx3	0.776	0.854	
PR1	0.848	0.794	
PR2	0.758	0.880	0.893
PR3	0.777	0.864	
BI1	0.802	0.797	
BI2	0.731	0.865	0.88
BI3	0.776	0.826	
UB1	0.53	0.183	
UB2	0.589	0.050	0.543
UB3	0.069	0.905	

The initial assessment of the questionnaire's internal consistency using Cronbach's Alpha coefficient (see Table 3) revealed that some sections, particularly Design Quality (DQ), needed improvement. The DQ section's coefficient fell below the recommended threshold of 0.7. Further analysis using Corrected Item-Total Correlation (CITC) pinpointed question DQ4 as a weak link due to its low correlation with other Design Quality items. Similarly, the Usage Behaviour (UB) section also showed lower reliability (see Table 4). Following this identification, questions DQ4 and UB3 (identified through a similar CITC analysis) were removed from the questionnaire to enhance its internal consistency.

Table 3. Cronbach's reliability analysis for DQ1-DQ4.

CITC value	Alpha if Item Deleted	Cronbach's Alpha

DQ1	0.673	0.394	0.641
DQ2	0.55	0.480	
DQ3	0.657	0.405	
DQ4	-0.003	0.866	

Table 4: Cronbach's reliability analysis for UB1-UB3.

	CITC value	**Alpha if Item Deleted**	**Cronbach's Alpha**
UB1	0.530	0.183	0.543
UB2	0.589	0.050	
UB3	0.069	0.905	

After removing these questions, the revised questionnaire demonstrated good reliability, with Cronbach's Alpha coefficients exceeding 0.8 for all variables. This indicates a strong internal consistency within each section. Additionally, all CITC values were above 0.4, signifying a good correlation between each item and the other items within its respective section (see Table 5).

Table 5. Summary of reliability analysis for the revised questionnaire.

	Correction term Total correlation (CITC)	**Alpha if Item Deleted**	**Cronbach's Alpha**
PE1	0.771	0.866	0.894
PE2	0.799	0.844	
PE3	0.809	0.835	
EE1	0.771	0.819	0.877
EE2	0.776	0.814	
EE3	0.742	0.845	
DQ1	0.755	0.802	0.866
DQ2	0.697	0.856	
DQ3	0.784	0.775	
SI1	0.816	0.835	0.895
SI2	0.759	0.886	
SI3	0.814	0.834	
HM1	0.795	0.843	0.893
HM2	0.766	0.869	
HM3	0.81	0.831	
PEx1	0.796	0.842	0.889
PEx2	0.796	0.83	
PEx3	0.776	0.854	
PR1	0.848	0.794	0.893
PR2	0.758	0.88	
PR3	0.777	0.864	

BI1	0.802	0.797	
BI2	0.731	0.865	0.880
BI3	0.776	0.826	
UB1	0.828	.	0.905
UB2	0.828	.	

Exploratory Factor Analysis (EFA) was conducted to assess the questionnaire's construct validity. EFA helps identify underlying factors (latent constructs) that explain the relationships between observed variables (questionnaire items) in the study. This ensures that the questionnaire measures the intended concepts within the extended UTAUT2 model.

Table 6. KMO and Bartlett's test results for pre-survey.

KMO and Bartlett's test		
	KMO value	0.720
Bartlett's test for sphericity	Approximate chi-square	1413.64
	df	325
	p-value	0.000

The analysis resulted in the removal of two questions (DQ4 and UB3) to improve the questionnaire's reliability. The revised questionnaire demonstrated good reliability and validity, suggesting it is an effective instrument for measuring the intended constructs.

5 DISCUSSION

5.1 Applicability of the UTAUT2 Model (Addressing Research Question 1)

This study builds upon the well-established UTAUT2 model, surpassing the simpler TAM model by considering a broader range of factors influencing user technology acceptance behaviour. UTAUT2 integrates multiple theoretical frameworks like TAM, TPB, and SCT, allowing for a multi-dimensional analysis. It goes beyond purely technical aspects, incorporating social and personal influences to paint a holistic picture. Notably, the model's core focus on predicting behavioural intentions, the direct precursors to actual usage behaviour (Tamilmani et al., 2021), aligns perfectly with the goals of this research: investigating museum visitors' intentions towards VR technology. This addresses research question (1).

5.2 Development of the Extended UTAUT2 Model (Addressing Research Question 2)

This study confirmed UTAUT2's suitability and adjusted the model variables based on the foundational framework. The conclusions of other researchers in the same field were reviewed and discussed. According to previous literature, factors such as perceived usefulness, ease of use, social influence, information quality, and system quality are frequently mentioned as influencing visitors'

intentions. Ultimately, this study identified seven independent variables and one mediating variable. Some of these variables are derived from the core UTAUT2 model (performance expectancy, effort expectancy, social influence, and hedonic motivation), while design quality, experience, and perceived risk were added. This addresses research question (2).

5.3 Validity and Reliability of the Extended Model (Addressing Research Question 3)

A 28-item questionnaire based on the extended model was designed and tested. Reliability and validity analyses were performed on a sample of 78 respondents to assess the effectiveness and reliability of the extended UTAUT2 model used in this research.

The questionnaire yielded positive results for both reliability and validity. Following a detailed numerical analysis, two questions (DQ4 and UB3) were removed, and the reliability of the revised questionnaire was re-evaluated. This process resulted in a refined dataset, confirming the questionnaire's robust reliability. From a validity perspective, the factor analysis model explained 72% of the total variance, indicating its effectiveness in capturing the primary patterns and structures within the data. Additionally, the convergence of factors after six rotations improved the interpretability of the rotated factors. All commonalities in this study exceeded 0.5, indicating the factors' strong ability to extract valid information.

Overall, the model demonstrated commendable reliability and validity, confirming that the extended UTAUT2 model employed in this study performed well in terms of effectiveness and reliability. This also underscores the revised UTAUT2 model's suitability for this research, with robust explanatory capabilities. This addresses research question (3).

6 CONCLUSION AND FUTURE WORK

This study explored the UTAUT2 model, demonstrating its advantages over the TAM model in understanding user technology acceptance. UTAUT2's broader range of variables allows for a more comprehensive analysis of user behaviour towards new technologies. Furthermore, the core UTAUT2 variables are relevant to the museum context, aligning with prior research findings. This validates the choice of UTAUT2 as a suitable framework for investigating museum visitors' intentions towards VR technology.

The research extended the UTAUT2 model and conducted a validation process. Based on the extended model, a questionnaire was developed and tested. Data collection involved distributing paper-based questionnaires to 78 participants. Reliability and validity analyses were performed to assess the instrument's effectiveness. Following these analyses, some questionnaire items were removed to refine the instrument.

The results confirmed the effectiveness and reliability of the extended UTAUT2 model. This indicates its suitability for studying museum visitors' intentions towards VR technology in Guangdong. The validated, extended model serves as a strong foundation for future research

involving large-scale data collection and analysis. Applying this model enables researchers to identify the key factors influencing visitors' intentions towards VR experiences in Guangdong museums. Future studies could explore user experience by segmenting data by age groups. This would reveal potential variations in perspectives and usage intentions across generations (e.g., Gen X, Gen Y, Gen Z). Understanding these generational differences will be valuable for tailoring VR exhibitions and services to better suit visitors of various ages, ultimately enhancing their overall museum experience.

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Appendix A

Initial Questionnaire Items (28 items).

Constructs	Items	Source(s)
Performance Expectancy	PE1: When visiting a museum, I believe using VR technology can effectively enhance my museum experience.	Xie (2017), Mi (2022), Zhao (2019), Liang & Liu (2022)
	PE2: Using VR technology can help me better understand the exhibition content.	
	PE3: Using VR technology can provide me with more information and knowledge at the museum.	
Effort Expectancy	EE1: I believe that with effort, I can learn VR technology.	
	EE2: I believe that using VR products only requires learning simple operating methods.	
	EE3: I am confident that I can quickly master VR skills.	
Social Influence	SI1: The people around me all support using VR products, and I would consider using them.	
	SI2: I think using VR products is a trend, and I will follow the trend to try it.	
	SI3: If the people I am with and the people in my environment are using VR products, I would also consider using them.	
Design Quality	DQ1: I hope that the information content of VR products is accurate and rich.	
	DQ2: I believe that the high-quality graphics and information provided by VR technology make my usage experience more enjoyable.	
	DQ3: I believe that the high-quality interface design of VR products makes my usage experience more enjoyable.	
	DQ4: I believe the interface guide design of VR products can guide me to operate efficiently. [REMOVED]*	
Hedonic Motivation	HM1: I find using VR products an interesting thing.	
	HM2: It makes me feel very happy during the use.	
	HM3: Using VR products brings me a sense of curiosity and excitement.	
Past Experience	HB1: Using VR products has become a habit for me.	
	HB2: Even without others' suggestions, I would choose to use VR products to visit the museum.	
	HB3: Past experience can help me use VR technology.	

Perceived Risk	PR1: I think there are health risks in using VR products, such as physical discomfort, equipment not being disinfected, etc.	
	PR2: I have some worries and fears when using VR products.	
	PR3: I always feel that VR products have safety risks, such as losing direction in the real world after wearing VR glasses.	
Behavioural intention	BI1: I plan to continue using museum VR products in the future.	
	BI2: I am willing to try more museum VR products.	
	BI3: I would recommend more people to use it.	
Usage behaviour	UB1: I prefer to go to museums with VR technology.	
	UB2: I will continue to use VR products and encourage those with me to use them.	
	UB3: I will encourage others to use VR products. [REMOVED]*	