

**AN INTEGRATED FRAMEWORK FOR
UNDERSTANDING PUBLIC ADOPTION OF
DIGITAL HERITAGE NON-FUNGIBLE TOKEN
(NFT) IN HUNAN, CHINA**

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**AN INTEGRATED FRAMEWORK FOR
UNDERSTANDING PUBLIC ADOPTION OF
DIGITAL HERITAGE NON-FUNGIBLE TOKEN
(NFT) IN HUNAN, CHINA**

by

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LIST OF ABBREVIATIONS

AHP	Analytic Hierarchy Process
ATT	Attitude to using
BB	Benefit barrier
CFA	Confirmatory Factor Analysis
DH-NFT	Digital Heritage Non-Fungible Token
DIT	Diffusion of Innovations Theory
EB	Economic barrier
EFA	Exploratory Factor Analysis
GLAM	Galleries, Libraries, Archives, and Museums
IB	Image barrier
IRT	Innovation Resistance Theory
NFT	Non-Fungible Token
PU	Perceived usefulness
PEU	Perceived ease of use
PV	Perceived value
RB	Risk barrier
SEM	Structural Equation Modeling
TRA	Theory of Reasoned Action
TPB	Theory of Planned Behavior
TAM	Technology Acceptance Model
TS	Technostress
UNESCO	United Nations Educational, Scientific and Cultural Organization
USM-JEPeM	Universiti Sains Malaysia - Jawatankuasa Etika Penyelidikan Manusia
UTAUT	Unified Theory of Acceptance and Use of Technology
VB	Value barrier
VIF	Variance Inflation Factor

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**KERANGKA BERSEPADU UNTUK MEMAHAMI PENERIMAAN
AWAM TERHADAP *NON- FUNGIBLE TOKEN (NFT)* BAGI WARISAN
DIGITAL DI HUNAN, CHINA**

ABSTRAK

Kemunculan teknologi blockchain dan NFT telah membawa kepada pembangunan NFT warisan digital, yang membuka peluang baharu untuk pemuliharaan budaya dan penglibatan awam di China. Namun, kadar penerimaan awam kekal rendah. Kajian ini meneroka faktor-faktor yang mempengaruhi niat awam China untuk menggunakan NFT warisan digital dengan menggabungkan Model Penerimaan Teknologi (TAM) dan Teori Penolakan Inovasi (IRT), serta pemboleh ubah tambahan seperti tekanan teknologi, nilai yang dirasakan dan pengalaman pengguna. Tinjauan ke atas 443 responden di China digunakan sebagai asas analisis. Hasil Proses Hierarki Analitik (AHP) menunjukkan bahawa halangan imej dan ekonomi adalah penghalang utama, diikuti oleh tekanan teknologi dan halangan faedah. Analisis pemodelan persamaan berstruktur mengesahkan bahawa nilai yang dirasakan, pengalaman pengguna, sikap dan kegunaan yang dirasakan memberi kesan positif yang signifikan terhadap niat penggunaan. Walaupun halangan memberi kesan negatif, impaknya lebih lemah tetapi tetap signifikan. Analisis moderasi selanjutnya menunjukkan bahawa pengalaman pengguna boleh mengurangkan kesan negatif halangan terhadap kegunaan yang dirasakan. Kajian ini menyimpulkan bahawa halangan persepsi dan ekonomi menjadi faktor utama kelewatan penerimaan, tetapi pengalaman pengguna yang lebih baik mampu menampan kesan ini dan mengukuhkan niat penggunaan. Integrasi TAM dan IRT menawarkan rangka kerja yang lebih menyeluruh untuk memahami penerimaan teknologi warisan digital. Keterbatasan

kajian termasuk tumpuan kepada responden bandar dan reka bentuk kuantitatif, yang mungkin mengabaikan dimensi simbolik atau emosi dalam penglibatan budaya. Kajian masa hadapan disarankan menggunakan kaedah campuran dan melibatkan kumpulan pengguna luar bandar bagi menangkap dinamika sosio-budaya yang lebih meluas.

**AN INTEGRATED FRAMEWORK FOR UNDERSTANDING PUBLIC
ADOPTION OF DIGITAL HERITAGE NON-FUNGIBLE TOKEN (NFT) IN
HUNAN, CHINA**

ABSTRACT

The emergence of blockchain and NFTs has led to digital heritage NFTs, offering new opportunities for cultural preservation and public engagement in China. Yet, despite increasing visibility, public adoption remains limited. This study explores the factors shaping Chinese public intention to use digital heritage NFTs by integrating the Technology Acceptance Model (TAM) and Innovation Resistance Theory (IRT), incorporating technostress, perceived value, and user experience. A survey of 443 Chinese respondents informs the analysis. Analytic Hierarchy Process (AHP) results identify image and economic barriers as the most prominent deterrents, followed by technostress and benefit barriers. Structural equation modelling confirms that perceived value, user experience, attitude and perceived usefulness significantly enhance usage intention, while barriers exert weaker but significant negative effects. Moderation analysis reveals that user experience mitigates the impact of barriers on perceived usefulness, highlighting its crucial role in reducing resistance within the TAM-IRT framework. This study concludes that slow adoption is primarily driven by image and economic barriers, but enhanced user experience can buffer these effects and strengthen intention. The integration of TAM and IRT offers a more comprehensive model for understanding digital heritage technology adoption. Limitations include the focus on urban respondents and the quantitative design, which may overlook symbolic or emotional dimensions of cultural engagement. Future

research should adopt mixed methods and expand to rural and diverse user groups to capture broader sociocultural dynamics.

CHAPTER 1

INTRODUCTION

1.1 Introduction

The rapid advancement of blockchain technology has facilitated the emergence of non-fungible tokens (NFTs)—a distinct class of digital assets that represent ownership and authenticity of unique digital or physical items. Unlike cryptocurrencies, which are fungible and interchangeable by value (e.g., one Bitcoin equals another Bitcoin), NFTs are inherently non-fungible: each token is unique and irreplaceable (Dowling, 2022a; Vairagade et al., 2022). This uniqueness is preserved through metadata stored on the blockchain, which records verifiable information such as ownership, provenance, and transaction history (Scheiding, 2022). As such, NFTs are especially valuable for certifying authenticity, scarcity, and ownership in the digital domain.

NFTs have been widely adopted across various industries, including digital art, music, gaming, intellectual property, and virtual real estate. Popular blockchain platforms like Ethereum, Flow, and Tezos support the minting and trading of NFTs, enabling new forms of digital ownership and market structures (Sarkodie et al., 2022). While many NFTs emphasize aesthetic, entertainment, or speculative value, a growing category of Digital Heritage NFTs—those that tokenize cultural heritage assets—has emerged as a tool for preservation, education, and public engagement.

Digital heritage NFTs leverage blockchain's permanence and transparency to digitally preserve and disseminate tangible and intangible cultural heritage. They enable cultural institutions such as museums, archives, and heritage organizations to authenticate and share their collections in new, interactive formats. Moreover, they offer financial opportunities through new monetization models, helping institutions

address funding challenges (L. Li, 2022; L. Zhao et al., 2023). Importantly, digital heritage NFTs help bridge the gap between heritage custodians and the public by making cultural content more accessible and participatory (Díaz-Andreu, 2017; Morse et al., 2021; Nassaney, 2021; Ongena et al., 2013).

In the Chinese context, while the practical adoption of digital collections has accelerated—driven by NFT-powered mobile applications and government-led digital initiatives—theoretical research remains underdeveloped (Pengju W, 2022). Despite the cultural and technological momentum, the adoption of digital heritage NFTs by the general public remains uneven, with clear disparities across age, region, and digital literacy. Moreover, significant variations in adoption rates between countries highlight the need to explore socio-cultural, psychological, and technological factors that influence public acceptance and resistance (Halim et al., 2023; S. Lee et al., 2022; Rabaa'i et al., 2024; Soon et al., 2024).

Understanding public adoption of digital heritage NFTs is critical for both academic inquiry and practical implementation. On the one hand, these digital tokens present a novel intersection of cultural preservation and technological innovation (Stublić et al., 2023a); on the other, their societal impact depends heavily on public willingness to engage with them (Díaz-Andreu, 2017; Nassaney, 2021; Richardson, 2014). In a country as culturally rich and digitally ambitious as China, assessing the factors that drive or hinder public participation in digital heritage projects is essential for achieving inclusive and sustainable digital transformation in the cultural sector (J. Taylor & Gibson, 2017; Wen et al., 2023; Zahidi et al., 2014). Without such understanding, initiatives risk being technologically advanced but socially disconnected—failing to achieve their intended cultural, educational, or economic outcomes.

To investigate the underlying mechanisms that drive or hinder public adoption of digital heritage NFTs, this study adopts an integrated theoretical framework that combines the extended Technology Acceptance Model (TAM) (Davis, 1989) with Innovation Resistance Theory (IRT) (Ram & Sheth, 1989). This complementary approach enables a balanced examination of both drivers and barriers influencing behavioral intention from the end-user perspective (Rahaman & Tan, 2010, 2011). By applying this integrated model, the study offers a comprehensive understanding of the public's perceptions, attitudes, and willingness to engage with digital heritage NFTs in the Chinese cultural and technological context.

To guide this inquiry, the chapter is structured into seven key sections: research background, problem statement, research questions, research objectives, the proposed theoretical model and hypotheses, the scope and significance of the study, and operational definitions of key terms.

1.2 Research Background

Heritage represents the wealth accumulated throughout human history, embodying the wisdom of ancestors and witnessing the evolution of civilizations. It encompasses both natural and cultural forms and serves as a vital resource for the continuity of human memory and identity. With the rapid development of new media technologies, the digitization of heritage has accelerated significantly. This transformation involves the creation, access, distribution, and preservation of heritage in digital form, giving rise to what UNESCO (2003) terms digital heritage. Scholars have since expanded this concept, referring to the integration of new media into heritage services as virtual or digital heritage (Kalay et al., 2008).

Researchers from diverse disciplines such as architecture, history, museum studies, and computer science have explored the potential of digital heritage in communicating both tangible and intangible cultural value (Mason & McCarthy, 2008; Wingström et al., 2024; K. Zhang & Fan, 2024). Projects like Melbourne Museum’s “Virtual Room” exemplify how digital technologies can enrich visitor experiences by enabling immersive, three-dimensional interactions with cultural artifacts (Kalay et al., 2008). However, despite UNESCO’s Charter on the Preservation of Digital Heritage (2003), public awareness regarding the risks of digital heritage loss remains limited, particularly considering that much of today’s knowledge is created and transmitted digitally (Sullivan, 2016) (Li Jing, 2014). Consequently, sustainable strategies must ensure that digital heritage is accessible, representative of cultural diversity, and preserved across generations (X. Wu et al., 2022).

In recent years, blockchain technology and non-fungible tokens (NFTs) have emerged as promising tools for digital heritage protection. In China, institutional interest in digital copyright and cultural innovation has led to the introduction of blockchain-based systems, such as the China Copyright Chain, which facilitates copyright confirmation, infringement detection, and judicial protection of digital content (Xiao, 2022). These efforts are supported by revisions to the Copyright Law in 2021, emphasizing the legal and technological foundations for protecting digital cultural assets.

As shown in Figure 1.1 and Figure 1.2, initiatives like the Palace Museum’s “Digital Cultural Relics Library” and the Dunhuang Academy’s collaboration with global institutions to release NFT-based cultural relics highlight the growing use of NFTs in cultural dissemination and heritage monetization (X. Wu et al., 2022; Y. Wu et al., 2022; L. Zhao et al., 2023). These innovations are redefining cultural

consumption, shifting from passive preservation to proactive public engagement (Addis et al., 2015).



Figure 1.1 The Palace Museum's Digital Cultural Relic Library. Source: <https://digicol.dpm.org.cn>, The Palace Museum, 2023



Figure 1.2 The Dunhuang Research Institute has launched a cultural and innovative digital collection (NFT) as a public service. Source: <https://baijiahao.baidu.com/s?id=1733140092042328431&wfr=spider&for=pc>, China Daily Online, 2022

However, the global adoption of NFTs remains uneven. The adoption of NFTs faces notable barriers, particularly among general users who often lack the necessary technical knowledge or digital literacy (Hsiao & Shen, 2023; Kili & Ekizler, 2022; J. Lee, 2022a). Even blockchain researchers question its scalability across industries (Potts & Rennie, 2018; Rennie et al., 2019). As Rennie notes, “the unknown factor is

not what blockchain is, nor even its use cases, but how it shapes the actions of those who utilize it”—emphasizing a critical research gap in understanding user behavior.

Cross-national differences further complicate the landscape. As summarized in Table 1.1, while the United States emphasizes the financialization of NFTs on public chains for speculative purposes, Europe and China focus on cultural value, consumer protection, and regulatory control (Jiang et al., 2023). China’s government classifies NFTs as digital cultural creations, restricts secondary market trading, and promotes their use in cultural dissemination rather than speculative investment (Jin, 2021; L. Li, 2022; L. Zhao et al., 2023). These contrasting regulatory models shape how users perceive and adopt NFT-based applications.

Table 1.1 Comparison of NFT Usage and User Behaviour: USA vs. EU vs. China

Category	USA	EU	China
Primary Uses	Investment speculation, art collection, gaming, social identity, brand marketing	Art collection, cultural heritage, brand marketing, gaming, green NFTs	Digital collectibles, cultural IP, social identity, brand marketing
Trading Model	Free market, high liquidity, some NFTs reach high prices	Regulated, KYC required, speculation is restricted	No secondary market trading, only for collection
Technology Base	Ethereum, Solana, Flow, and high-liquidity public chains	Ethereum, Polygon, Tezos, and other eco-friendly blockchains	Consortium chains (Alibaba Jingtian, Tencent Zhixin Chain, Baidu Super Chain)
Legal Regulation	Relatively relaxed, free NFT transactions	Strictly regulated under MiCA, financialization is limited	Heavily regulated, NFTs are restricted to cultural collection purposes
Main Applications	Art, investment, gaming assets, social identity (e.g., BAYC)	Cultural IP, museum NFTs, luxury brand NFTs, in-game assets	Traditional cultural IP, social identity, brand collaborations on digital collectibles
Representative Cases	Bored Ape Yacht Club (BAYC), NBA	Sorare (NFT football cards), Gucci Vault NFT, Louvre	Alibaba Jingtian, Tencent Huanhe (shut

Category	USA	EU	China
	Top Shot, The Sandbox	Museum digital collections	down), Xiaohongshu R-Planet
User Behaviour Goals	Speculation (short-term investment), social identity (BAYC, etc.), digital art collection	Cultural collection (museum IP), brand social identity, virtual asset transactions (gaming)	Commemorative collection (Dunhuang, Forbidden City), brand interaction (consumer goods/automobile NFTs), social display (Xiaohongshu NFTs)
Social Influence	NFT profile pictures (e.g., BAYC) are seen as social status symbols	Some NFTs serve as membership access, such as exclusive luxury brand events	Brand communities (e.g., Xiaohongshu R-Planet), fan engagement (celebrity NFTs)
Speculative Nature	Highly speculative, frequent NFT trading	Low, due to regulatory restrictions	Restricted by policy, speculation is banned
Environmental Awareness	Moderate, the market is still dominated by Ethereum, which has high energy consumption	High, eco-friendly blockchains (Tezos, Polygon) are preferred	Less focus, mainly reliant on consortium chains operated by large enterprises

Given such complexities, it is essential to understand how users interact with digital heritage NFTs—not merely in terms of access and availability but through the lens of behavioral intention, resistance, and engagement. Despite China's active deployment of digital platforms for cultural heritage, research on what drives or hinders public acceptance of digital heritage NFTs remains limited (Chang et al., 2024; White et al., 2022; C. H. Wu & Liu, 2023). Understanding these dynamics is critical for ensuring that digital heritage technologies are not only technically feasible but also socially and culturally embraced.

1.3 Problem Statement

The rapid advancement of blockchain and NFT technologies has brought transformative possibilities to the field of cultural heritage, enabling new forms of access, preservation, and engagement. In China, this technological shift has been accompanied by state-level initiatives and institutional efforts that embed NFTs within the cultural and creative industries, with particular emphasis on public education, copyright protection, and digital innovation. Despite these developments, public adoption of digital heritage NFTs remains limited and uneven. As UNESCO (2003) cautioned, technological innovation often outpaces public awareness and institutional readiness—an observation that remains highly relevant in the current digital heritage context.

Although digital heritage NFTs present unique advantages in terms of authenticity, traceability, and long-term preservation, their adoption among the general public is hindered by a variety of perceptual, psychological, and technological barriers. Existing literature has primarily focused on the technological feasibility, legal frameworks, or institutional applications of NFTs (Belteki et al., 2025; Friedman & Ormiston, 2022; Rehman et al., 2021), while scholarly attention to end-user behavior, particularly in cultural heritage settings, remains scarce (White et al., 2022; C. H. Wu & Liu, 2023; L. Zhao et al., 2023). Studies that do examine NFT adoption often center on financial speculation, gaming, or digital art ownership, leaving a significant gap in our understanding of how the public engages with NFTs as a means of cultural participation and digital preservation (Chang et al., 2024; Lyu et al., 2023b; Soon et al., 2024; Yilmaz et al., 2023).

Moreover, prior research has largely emphasized the enablers of technology adoption (e.g., perceived usefulness or ease of use), while resistance and inhibition

factors remain underexplored. This one-sided approach may result in an incomplete understanding of behavioral intention, especially in the cultural domain where emotional, cognitive, and contextual factors interact. In China, where NFTs are positioned as non-speculative “digital cultural creations,” the motivations, concerns, and behaviors of everyday users are likely shaped by both positive drivers and negative barriers, such as risk perception, technostress, or lack of trust in digital platforms (Chang et al., 2024; Q. Wang et al., 2024; Zarifis & Castro, 2022).

To address this gap, the current study proposes an integrated theoretical framework combining the Technology Acceptance Model (TAM) and Innovation Resistance Theory (IRT). This framework enables a dual-perspective analysis—examining both facilitating factors (e.g., perceived value, user experience) and resistance factors (e.g., risk barrier, economic barriers, image barriers)—that shape behavioral intention. By focusing on public users in Hunan Province, this research provides a localized and socially grounded understanding of how digital heritage NFTs are perceived, accepted, or resisted by non-expert users in China.

Through this approach, the study aims not only to bridge a critical academic gap but also to inform policymakers, museum professionals, and digital platform developers on how to enhance public engagement with NFT-based cultural initiatives.

1.4 Research Questions

Research questions are also organized according to the research phase. The questions are as follows:

RQ1: What are the key technological and psychological factors that positively influence the public's intention to adopt digital heritage NFTs in China?

RQ2: What are the primary resistance factors that hinder public adoption of digital heritage NFTs, and how do these factors interact with enabling conditions?

RQ3 : How does an integrated TAM-IRT framework explain the causal relationships between drivers, barriers, and the public's behavioral intention to use digital heritage NFTs in a Chinese cultural context?

1.5 Research Objectives

To examine the impact of motivating and discouraging factors on the public's willingness to use digital heritage NFTs.

RO1 : To identify and examine the enabling factors—such as perceived usefulness, perceived ease of use, perceived value, and user experience—that promote the public's behavioral intention to adopt digital heritage NFTs.

RO2: To explore and analyze resistance factors—such as risk barriers, value barriers, economic barriers, benefit barriers, image barriers, and technostress—that negatively affect public adoption of digital heritage NFTs.

RO3: To develop and empirically test an integrated TAM-IRT model that explains the combined effects of both drivers and barriers on public adoption behavior in the digital cultural heritage context of Hunan, China.

1.6 Research Hypothesis

This study aims to explore the key factors influencing the public's intention to use digital cultural heritage NFTs through the adoption of a quantitative research methodology. The research model integrates the Technology Acceptance Model (TAM) and the Innovation Resistance Theory (IRT), thereby addressing the limitations

of relying on a single theoretical framework. Together, these theories provide a foundation for understanding the relationships among variables such as barriers, drivers, and usage intentions. The study employs Structural Equation Modeling (SEM) and utilizes the graphical approach provided by Amos (Byrne, 2016) to analyze the complex relationships and pathways between variables (Blanthorne et al., 2006). SEM is particularly well-suited for examining both the direct and indirect effects of multiple latent constructs; therefore, it is capable of revealing the driving and hindering factors that affect the public's adoption of digital cultural heritage NFTs.

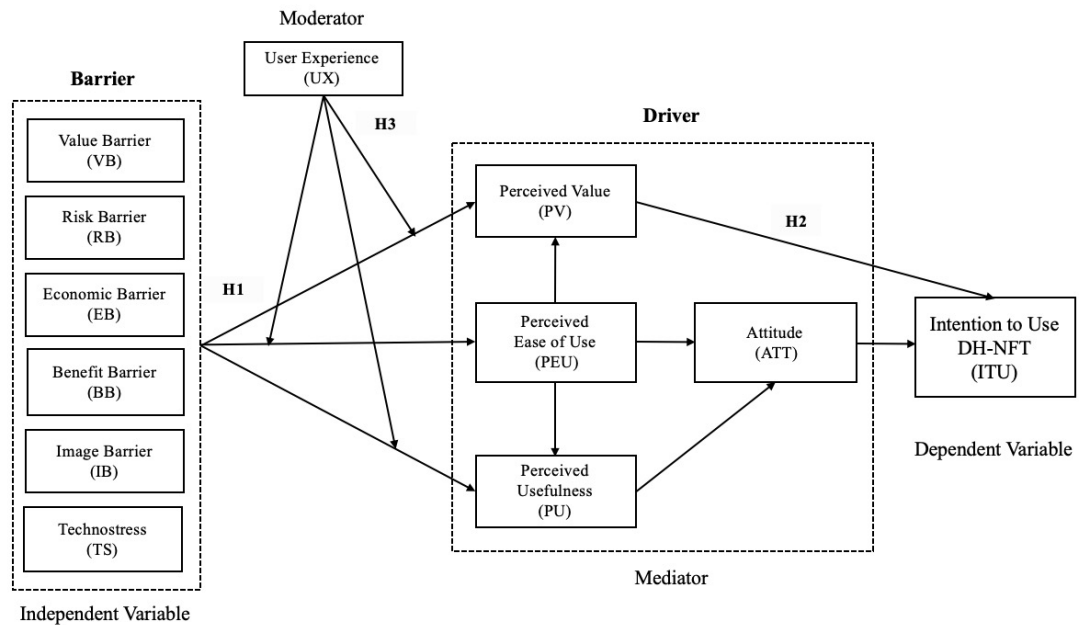


Figure 1.3 Hypothesized model

As illustrated in Figure 1.3, this study explores the relationships among barriers, drivers, and intention to use digital heritage NFT, and proposes three key hypotheses. First, Hypothesis 1 (H1) examines the relationship between barriers and drivers. The barriers include value barrier (VB), risk barrier (RB), economic barrier (EB), benefit barrier (BB), image barrier (IB), and technostress (TS), all of which may exert negative effects on the drivers. Specifically, these barriers might reduce users' perceived value (PV), perceived ease of use (PEU), and perceived usefulness (PU), and attitude (ATT)

of digital heritage NFTs. For instance, users might perceive high risks or costs associated with NFTs, thereby diminishing their perceived value and usefulness. Additionally, technostress could lead users to consider the NFT technology as overly complex, thus lowering their perceived ease of use. This suggests that the presence of barriers may weaken the positive effects of drivers, consequently inhibiting users' positive perceptions of NFTs.

H1: Barriers (VB, BB, RB, EB, IB, and TS) negatively influence drivers (PEU, PU, and PV).

Second, Hypothesis 2 (H2) examines the relationship between drivers and the intention to use digital heritage NFTs. According to the Technology Acceptance Model (TAM), perceived ease of use and perceived usefulness are key drivers that influence users' behavioral intentions. When users perceive NFTs to be both easy to use and useful, they are more likely to develop a strong intention to use them (ITU). Additionally, the model incorporates perceived value as a critical driver, given that digital cultural heritage NFTs are closely related to tangible cultural heritage, possessing unique historical and cultural value. Therefore, these drivers play a crucial role in users' decision-making processes, and positive drivers significantly enhance users' behavioral intentions.

H2: Drivers (PEU, PU, PV, and ATT) positively influence the intention to use digital heritage NFTs (ITU).

Lastly, Hypothesis 3 (H3) posits that user experience (UX) acts as a moderating variable, influencing the relationship between barriers (VB, BB, RB, EB, IB, and TS) and drivers (PEU, PU, PV and ATT). A positive user experience can mitigate the negative impacts of barriers on perceived value, perceived ease of use, and perceived usefulness. For example, despite the presence of high costs or technical complexities,

if users have a favorable experience during usage, they may still perceive NFTs as valuable and easy to use. Thus, user experience has the potential to alleviate the negative effects of barriers.

H3: User experience (UE) positively moderating the relationship between the barriers (VB, BB, RB, EB, IB, and TS) and the drivers (PEU, PU, PV and ATT).

The three research hypotheses proposed above suggest both direct and indirect relationships between barriers, drivers, and usage intention. The specific hypothesized relationships among these variables are thoroughly explained in Chapter 2, where the researcher provides a detailed discussion grounded in the literature review. This approach ensures that the proposed relationships are well-supported by existing studies, thus reinforcing the logical consistency and theoretical basis of the research framework.

1.7 Research Aim and Scope

This study aims to promote the widespread adoption of digital heritage NFTs and to enhance public awareness of digital heritage protection. Digital heritage, as a crucial component of cultural heritage protection, is increasingly influenced by technological innovations. Particularly under the impetus of blockchain technology and non-fungible tokens (NFTs), cultural heritage can now be preserved and disseminated in novel ways. Digital heritage NFTs, as a distinctive form of Chinese digital cultural products, also offer unprecedented opportunities for public participation. This study examines the factors influencing the public's intention to use digital heritage NFTs, providing both theoretical foundations and empirical support for promoting public engagement in digital heritage preservation and dissemination. Additionally, it aims to facilitate the adoption of digital heritage NFTs in China to enhance public awareness of digital heritage conservation.

Literature indicates that public participation in cultural heritage protection has gained increasing attention from the academic community. Díaz-Andreu (2017) asserts that public interest and involvement in cultural heritage are critical to the success of its preservation. Arnstein (2019) further emphasizes that with the advancement of digital technologies, the public can not only serve as bystanders but also play an active role in contributing to cultural heritage protection. This form of public participation is facilitated by platforms such as social media and blockchain, leading to significant improvements in information sharing and knowledge dissemination within digital heritage projects. Moreover, Gu (2022) demonstrates that NFT technology provides new pathways for the digitization and sustainable development of cultural heritage, contributing to a deeper public understanding of and engagement in heritage preservation.

This study selects Hunan Province as the primary data collection site due to its unique convergence of cultural, technological, and policy advantages. As the third-ranking province nationwide in terms of cultural relics, Hunan has a rich heritage foundation supported by prominent institutions such as the Hunan Museum, which alone has welcomed over 10 million visitors since 2017. In recent years, Changsha has emerged as a digital innovation hub, integrating cultural preservation efforts with blockchain development through university–museum–enterprise collaborations (Hunan Provincial Department of Culture and Tourism, 2024). Notably, in 2024, the provincial government launched initiatives such as “museum-university integration” and authorized universities to digitize and commercialize relics from the Mawangdui Han Tombs using NFT and blockchain technologies (Hunan Daily, 2024).

In this context, Hunan represents a pioneering region in China’s experimentation with digital heritage NFTs. However, despite these advancements,

public understanding and adoption of digital heritage NFTs remain limited, and empirical data on user perceptions are lacking. As such, conducting this study in Hunan provides a timely and strategic opportunity to investigate public behavioral intention at a critical intersection of policy innovation and cultural practice.

The survey was conducted in the public areas surrounding the Hunan Museum, targeting Chinese citizens aged 18 to 59, a demographic both eligible for digital NFT participation and most likely to engage with mobile digital collections. Individuals under 18 were excluded due to legal and cognitive limitations, while those over 59 were excluded due to higher levels of technological anxiety (Mariano et al., 2022). To avoid sampling bias, experts and researchers were also excluded to ensure the results reflect the views and behavioral tendencies of the general public (Zahidi et al., 2014), not early adopters or domain specialists.

By focusing on Hunan, this study not only leverages a highly relevant and data-rich environment but also addresses a pressing gap in understanding how non-specialist users engage with digital heritage technologies, offering valuable implications for wider national adoption and public cultural participation strategies.

1.8 Significance of Study

This study provides significant theoretical value by establishing a comprehensive framework to enhance the understanding of public adoption of digital heritage NFTs. Scholars and researchers in the fields of digital heritage preservation, cultural heritage management, and technology acceptance will benefit from the findings of this research. By extending the Technology Acceptance Model (TAM) through the incorporation of variables such as user experience (UE), perceived value

(PV), and innovation resistance, this study enriches the existing theoretical model and offers a robust foundation for future research. These insights pave the way for scholars to further investigate the complex interplay of technological and cultural variables that shape user adoption in the heritage domain. Furthermore, the study addresses a notable gap by focusing on the Chinese context—offering culturally grounded, cross-contextual insights that contribute to the global discourse on digital heritage engagement in non-Western settings. As such, this research advances theory in both cultural heritage and technology adoption fields, providing a nuanced framework that promotes future academic inquiry.

From a practical standpoint, this study offers valuable guidance for decision-makers—including cultural institutions, policymakers, and creative industries—who aim to promote the public adoption of digital heritage NFTs. The identification of key influencing factors such as user experience, perceived value, and innovation barriers yields actionable insights for practice. These findings can inform strategies that optimize user-centered design, alleviate technostress, and enhance perceived value, thus expanding public participation and unlocking new pathways for financial sustainability in cultural preservation. Moreover, by offering a user behavior model grounded in empirical evidence, this research supports stakeholders in formulating effective engagement and communication strategies. Ultimately, by diagnosing both the enablers and obstacles to NFT adoption, the study contributes to the sustainable preservation and promotion of cultural heritage in the digital era.

1.9 Operational Definitions

The following definitions provide clarity on key terms used in this study:

Digitization of Cultural Heritage - Encompasses not only the digital management of museum collections and exhibitions but also the integration of emerging technologies to enhance engagement and promote cultural heritage (H. Yang, 2023). In the context of digital heritage NFTs, digitization extends beyond traditional archival practices to include blockchain-based authentication, ownership verification, and interactive digital experiences, enabling broader public participation and long-term preservation of cultural assets.

Digital heritage NFTs - A novel cultural innovation product that leverages blockchain technology for copyright protection while enabling public accessibility and commercial utilization of cultural heritage (Gu, 2022). For users, digital heritage NFTs offer a new way to engage with cultural artifacts, providing a sense of ownership, verifiability, and potential economic value, while also fostering global appreciation and awareness of digital heritage.

Technology Acceptance Model (TAM) - A theoretical framework developed to explain and predict user acceptance and usage behaviour of new technologies or systems. TAM is primarily based on two core constructs: perceived usefulness and perceived ease of use (Davis, 1989). In the context of digital heritage NFTs, TAM helps assess how users perceive the practical benefits and usability of these digital cultural innovation products, influencing their willingness to engage with and integrate them into their cultural appreciation and preservation practices.

Innovation Resistance Theory (IRT) - A theoretical model that explains consumer resistance to new technologies or innovations. IRT posits that resistance is not merely a refusal to adopt but may arise due to perceived risks, habitual behaviours, social influences, or other factors. It categorizes barriers into two primary types: functional barriers and psychological barriers (Ram & Sheth, 1989). When applied to

digital heritage NFTs, IRT provides insights into why some users hesitate to engage with these digital cultural assets.

Value Barrier - Refers to consumers' perception that a new product lacks sufficient performance or monetary value compared to existing alternatives, thereby reducing its adoption potential (Ram & Sheth, 1989). For digital heritage NFT users, the key concern is whether the NFT provides unique cultural, artistic, or collectible value. When no significant advantage is perceived over free digital content or physical artifacts, adoption is less likely.

Economic Barrier - Arises when consumers perceive that the pricing of a new product or service is unreasonable or does not justify its value (Talwar et al., 2021). Digital heritage NFT users may hesitate due to concerns about pricing transparency or high costs relative to similar digital assets. A lack of clear added benefits may further discourage adoption.

Benefit Barrier - Occurs when users perceive that a new service provider offers insufficient benefits or that the provided benefits hold little practical value (Talwar, Dhir, et al., 2020). Digital heritage NFT users often expect exclusive perks, such as museum access or community engagement opportunities. When an NFT functions solely as a digital collection without meaningful added value, users may lose interest.

Risk Barrier - Refers to the anticipated uncertainty or possible adverse outcomes linked to the adoption of emerging technology (Cheng et al., 2006). For digital heritage NFT users, concerns may include financial loss, security risks, or the long-term value of purchased assets. A lack of regulatory protection or market stability can further heighten reluctance.

Image Barrier - Describes the negative perception associated with a product, service, or technology that affects user adoption (Ram & Sheth, 1989). In the context of digital heritage NFTs, users may worry about their association with speculative investments or question their cultural legitimacy. Negative media portrayals or public skepticism can further reinforce resistance (Laukkanen, 2016; Joachim et al., 2018).

Technostress - A psychological strain resulting from difficulties in adapting to or managing new technologies (Brod, 1986). Digital heritage NFT users may feel overwhelmed by the complexity of blockchain systems, concerns over data security, or the fast-evolving nature of the technology. Uncertainty about its long-term viability can further contribute to stress and reluctance to adopt.

Perceived Ease of Use - The degree to which an individual believes that using a specific technology will be effortless and free of difficulty (Davis, 1989; Venkatesh et al., 2003; Venkatesh & Davis, 2000). For digital heritage NFT users, this reflects their ability to navigate platforms, complete transactions, and manage their collections without requiring extensive technical knowledge. Key factors influencing perceived ease of use include an intuitive interface, streamlined interactions, and a seamless operational experience.

Perceived Usefulness - The extent to which a user believes that adopting a particular technology will enhance their efficiency and ability to achieve personal or professional goals (Davis, 1989). In the context of digital heritage NFTs, this pertains to how users perceive the value of NFTs in enriching their cultural engagement, expanding their collections, or providing financial and social benefits. A higher perceived usefulness increases motivation to adopt the new technology product.

User Experience - The overall perception and response of users when interacting with a product or service, an essential concept in human-computer

interaction design (Datig, 2015). For digital heritage NFT users, user experience extends beyond ease of use to encompass visual aesthetics, interaction fluidity, personalized recommendations, and system responsiveness. A high-quality user experience enhances user satisfaction and fosters long-term engagement with the digital cultural product.

Perceived Value - The consumer's overall assessment of a product or service based on the perceived benefits relative to the associated costs (Zeithaml, 1988). Digital heritage NFT users evaluate whether these digital assets provide cultural, aesthetic, or financial worth that justifies the investment. A strong perceived value encourages adoption, while doubts about authenticity, exclusivity, or long-term worth may create hesitation.

Attitude - A psychological tendency expressed through evaluative reactions toward an object, which can influence behavior and intentions. Stronger attitudes are more predictive of future actions (Albarracin & Shavitt, 2018). For digital heritage NFT users, attitude reflects their overall appraisal of NFTs, including perceived cultural significance, technological appeal, and potential benefits or drawbacks, which in turn influence their willingness to adopt and engage with the technology.

Intention - The motivational factor that drives individuals toward a specific behavior (Rezvani et al., 2012). While attitude reflects an individual's judgment of a product, intention signifies the underlying motivation to take action (Shoham & Brenčič, 2003). In the context of digital heritage NFTs, intention manifests as users' willingness to explore, purchase, or engage with NFTs, driven by factors such as perceived value, ease of use, and cultural interest.

1.10 Summary

This chapter examines the significance of digital heritage NFTs (non-fungible tokens) in the context of cultural heritage preservation, emphasizing their background, associated challenges, and the research framework. With the advancement of new media technologies, digital heritage has increasingly become a crucial component of cultural heritage protection. However, theoretical research in this field within China has lagged behind, resulting in significant disparities in public engagement and awareness regarding digital heritage preservation. Consequently, this gap has prompted researchers to explore the factors influencing public acceptance of digital heritage NFTs.

The research background highlights that the digitization of cultural heritage faces challenges across technological, legal, and cultural dimensions. Therefore, this study integrates the extended Technology Acceptance Model (TAM) with Innovation Resistance Theory (IRT) to establish a comprehensive framework for analyzing public behavioral intentions regarding the use of digital heritage NFTs. The research questions focus on the overall public perception of digital heritage NFTs and the driving and hindering factors influencing their usage intentions. Moreover, the study aims to identify the drivers and barriers affecting public intentions while validating the relationships between these factors.

To achieve this, three hypotheses are proposed to examine the negative effects of barriers on drivers, the positive effects of drivers on usage intention, and the moderating role of user experience. The research will be conducted in Hunan Province, targeting the general public aged 18 to 59, to conduct a comprehensive investigation of their perceptions and intentions to use digital heritage NFTs. In summary, this chapter underscores the theoretical and practical significance of the research,

providing a new theoretical foundation for the field of cultural heritage preservation, while offering actionable recommendations for policymakers and cultural institutions. Such insights are expected to enhance public engagement and awareness of digital heritage protection, thereby contributing valuable experiences and guidance for global cultural heritage preservation and public participation.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Building on the previous chapter, which outlined the research background, problem statement, research questions, objectives, scope, and significance, this chapter provides a comprehensive review of the relevant literature. It begins with an exploration of digital heritage preservation and the concept of digital heritage NFTs, followed by an examination of the benefits and significance of public adoption. Furthermore, key findings from previous studies are analyzed to identify research gaps concerning the public's readiness to adopt digital heritage NFTs. The primary focus of this chapter is the Chinese public's behavioral perception of digital cultural heritage NFT adoption. Additionally, it reviews empirical and theoretical research, as well as relevant methodological approaches. Encouraging public engagement with digital heritage NFTs—valued for their cultural, historical, and economic significance—is essential to preserving national identity in the digital era and safeguarding digital heritage assets for future generations. The chapter concludes with a discussion of the study's theoretical framework and the development of research hypotheses.

2.2 Guidelines for The Digitization and Preservation of Cultural Heritage

As a modern approach to digital heritage preservation, UNESCO's Charter on the Preservation of the Digital Heritage has evolved from a focus on individual objects and static displays to a broader perspective that encompasses narratives, practices, representations, and knowledge systems within their original socio-cultural contexts (Kalay et al., 2008). Recognizing the significance of documentary heritage in archives,

libraries, and museums as a vital part of collective memory, UNESCO, in collaboration with the University of British Columbia, organized the international conference The Memory of the World in the Digital Age: Digitization and Preservation in 2012. This initiative aimed to address key challenges in digital documentary heritage preservation and develop strategies to ensure its continuity, accessibility, and authenticity.

In Europe, cultural heritage digitization is supported by EU policies and funding programs, notably Creative Europe (2021–2027), which allocates €2.44 billion to the protection and promotion of Europe’s cultural and linguistic diversity, as well as the development of the cultural and creative sectors, particularly the audiovisual industry. Additional funding is available through Horizon 2020, Erasmus+, Europe for Citizens, and the European Structural and Investment Funds (About the Creative Europe Programme | Culture and Creativity, n.d.). The European Commission's Directorate-General for Communication Networks, Content and Technology (CNECT) oversees policy coordination and funding for cultural digitization and online access. For instance, Europeana, a digital platform, provides free access to digitized collections from European museums, archives, and libraries, supporting cultural heritage preservation and public engagement (Discover Europe’s Digital Cultural Heritage | Europeana, n.d.). Furthermore, through Horizon 2020, the Commission invests in digital tools and advanced technologies for conservation, museum sustainability, the revival of traditional crafts, and fostering innovation in the cultural and creative industries.

Digitization has become a global trend in the 21st century, transforming the preservation and promotion of cultural heritage (B. C. G. Lee, 2025). Estonia’s MuIS museum information system and five-year digitization plan (2018–2023), Latvia’s Digitization of Cultural Heritage Content project, and Lithuania’s Cultural Heritage Digitization Council and VEPIS virtual electronic *information system* demonstrate