

Research on the Intention of Subway Public Art Reception Based on TAM

Tai Shuai¹ SONG Hai-Jun²

1.Inner Mongolia Normal University, International Design Art College, 010022, Hohhot;

2.Inner Mongolia Normal University, International Design Art College, 010022, Hohhot)

E-mail of the corresponding author: 1402555620@qq.com

Abstract

Objective: This study investigates how metro public art influences the public's willingness to engage with and accept it, with the goal of providing theoretical guidance for designing works that resonate with public aesthetic preferences. **Methods:** Drawing on perceived value theory and the Technology Acceptance Model (TAM), an acceptance mechanism framework was developed. Key influencing dimensions were identified through theoretical analysis, and corresponding hypotheses were formulated. A questionnaire survey collected 252 valid responses, which were subjected to reliability and validity testing. Structural equation modeling using AMOS software was employed to test the proposed hypotheses and assess model fit. **Results:** Positive guidance was found to have no significant association with perceived ease of use. In contrast, both "internal imitation" and "construction valley value" exerted significant positive effects on perceived usefulness and perceived ease of use. **Conclusion:** Perceived usefulness and perceived ease of use are critical determinants of public acceptance intentions. Enhancing these two factors can effectively increase public engagement with metro public art, foster greater acceptance and aesthetic appreciation, and ultimately strengthen its social service value.

Key words: Metro Public Art; Technology Acceptance Model; Perceived value; Structural Equation Mode

DOI: 10.7176/ADS/115-03

Publication date: October 30th 2025

1.Introduction

Metro public art refers to design works created within metro spaces and presented to the public. It inherits the artistic, cultural, and regional characteristics of public art's local attributes (Liu, et al. 2021). Its presence is not merely a simple overlay of artworks, but rather an integrated component of the overall spatial environment. Due to the unique spatial constraints of metro environments, metro public art differs from contemporary art in that it does not primarily emphasize the expression of the artist's personal emotions. Instead, the installation and presentation of such works must take into account a certain degree of social sensitivity. Since metro public art is to some extent endowed with a compulsory public nature, it is expected to bear certain responsibilities in terms of public culture and art education when integrated into the scene. In terms of creation, following the principles of beauty remains a fundamental guideline for public art, making research into the public's aesthetic intentions and expectations particularly significant.

Existing literature has conducted relevant research and achieved certain results. For example, Professor Zhang Lili of Shanghai University analyzed the Stockholm metro as a case study, examining its geographical features, current development, and the evolution of public art. She identified the value of public art in urban diversification and summarized innovations and breakthroughs in metro public art from the perspectives of contextual adaptation, cultural empowerment, and artistic diversity. Similarly, scholar Xiao Guang and others have addressed issues concerning the current state of metro public art in China, including spatial affiliation, cultural construction, and aesthetic tendencies. Through case studies, they explored constituent elements, expressive language, and aesthetic attitudes, proposing a shift towards new media in metro public art. They further elaborated on the advantages and value of incorporating new media art into metro spaces, noting how digital technology brings new modes of artistic expression to metro public art.

At present, however, research from the audience perspective—particularly regarding public psychology and the "horizon of expectations" toward metro public art—remains limited. In view of this gap, this paper adopts an audience-centered approach, drawing on the Technology Acceptance Model (TAM) and perceived value theory to analyze the factors influencing public acceptance intentions toward metro public art. A structural equation model is employed to test the proposed hypotheses. The findings of this study are intended to provide a theoretical basis and design reference for the practice of metro public art.

2.Theoretical Model and Experimental Hypotheses

2.1. Theoretical Model

2.1.1. TAM Model

The Technology Acceptance Model (TAM), introduced by Davis in 1989, is a theoretical framework for analyzing and predicting user acceptance of new technologies or systems. It focuses on two core variables: perceived usefulness ((Perceived Usefulness, PU)) and perceived ease of use (Perceived Ease of Use, PEOU), which are considered fundamental determinants of user acceptance. Perceived usefulness refers to the degree to which a user believes that using a particular system or technology will enhance their job performance, while perceived ease of use denotes the user's perception of the system's or technology's ease of operation, understanding, and cognitive effort required.

Widely applied in psychology, sociology, and design, TAM's explanatory power is enhanced when combined with other theories to account for factors such as subjectivity, information identifiability, and environmental differences. Given its relevance to analyzing user acceptance behavior and intentions, and considering the direct impact of public acceptance on the direction of metro public art creation, this study employs TAM's core variables—perceived usefulness and perceived ease of use—to investigate the factors influencing public acceptance of metro public art.

2.1.2. Perceived Value

Perceived value refers to the public's subjective understanding and evaluation of a particular product or service, which in turn influences their behavioral tendencies. Originating from consumer perception theory, perceived value theory links perceived quality, price, and value through exploratory research. Perceived value is generally divided into five dimensions: functional, social, situational, cognitive, and emotional . In the field of design studies, the theory has been applied in areas such as the optimization of cultural and creative products and the design of information on product packaging.

In the context of metro public art design, the public's perceived value affects both their acceptance and satisfaction with the work. Unlike contemporary art, which often emphasizes the artist's self-expression, art in public spaces must undergo a process of public critique, reinterpretation, and re-acceptance before its value can be realized. If a work is merely installed without considering participatory interaction, its public nature and social value are likely to be diminished a point that aptly underscores the necessity of audience engagement.

Accordingly, this study integrates perceived value theory with the Technology Acceptance Model (TAM) and relevant theories of metro public art in a cross-disciplinary framework. It aims to reveal the relationships between perceived usefulness, perceived ease of use, perceived value, and acceptance intention. Based on this, an acceptance model for metro public art is constructed, from which targeted design strategies are proposed to promote two-way interaction between the public and metro public art. The ultimate goal is to enhance audience satisfaction with design works and provide a reference for future design practice and research.

Based on the above analysis, this study incorporates perceived value as a latent variable into the TAM model to construct the theoretical model for this research, (see Fig. 1).

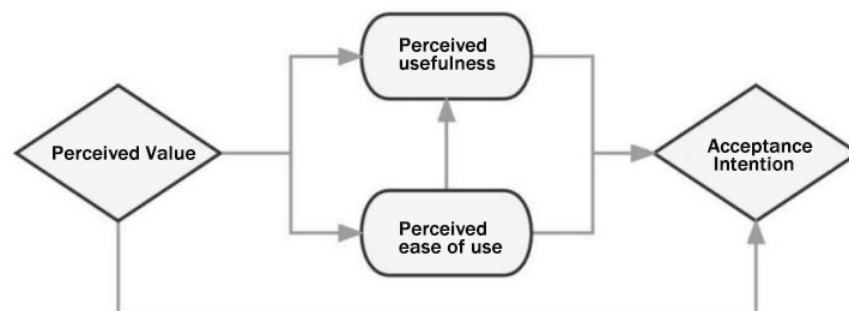


Fig.1 Theoretical model of this study

2.2. Research Hypotheses

This study primarily aims to analyze latent variables that cannot be directly measured. Hypotheses are derived from the five dimensions of perceived value, focusing on secondary concepts for greater precision. Social value

is replaced with "positive guidance," situational value with "internal imitation," and cognitive value with "construction valley value."

2.2.1 Construction valley value and Public Perception in Metro Public Art

Based on Daniel Kahneman's "peak-end rule," (Zhong, et al. 2022) which posits that people's evaluations of experiences are primarily influenced by peak (highest/lowest) and end moments, creating memorable "valley" experiences (negative peaks) in metro public art can profoundly impact the public with relatively minimal investment. The ability to engage and leave a lasting impression within limited interaction time directly affects acceptance intentions.

H1a: The construction of valley experiences in metro public art positively influences perceived usefulness.

H1b: The construction of valley experiences in metro public art positively influences perceived ease of use.

2.2.2 Internal Imitation and Public Perception in Metro Public Art

Aesthetic reception is a complex process involving both physiological and psychological dimensions. The theory of aesthetic empathy reveals that human beings can transplant their emotions onto external creations. (Zou, et al. 2021). Artificial empathy and the paradigm shift in aesthetic psychology. Gansu Social Sciences, (5), 47–53.) As a branch of empathy theory, inner imitation refers to the capacity of human beings to endow spaces and design works with different cultural connotations through autonomous emotional engagement. According to the theory of "inner imitation," individuals imbue spaces and artworks with cultural significance through autonomous emotions, fostering a specific field and resonance. Achieving "human-object empathy" in metro public art eliminates estrangement, enabling self-projection and resonance.

H2a: Internal imitation in metro public art positively influences perceived usefulness.

H2b: Internal imitation in metro public art positively influences perceived ease of use.

2.2.3 Positive Guidance and Public Perception in Metro Public Art

Hans Robert Jauss's reception aesthetics theory suggests that the public's "horizon of expectations" is guided by the work's structure (Zhou, et al. 2022). Metro public art, blending art and technology, bridges virtual and psychological realms, serving as an effective means of aesthetic education with profound implications for spiritual life and cultural development. Designs with positive impacts and guidance are more readily accepted.

H3a: Positive guidance in metro public art creation positively influences perceived usefulness.

H3b: Positive guidance in metro public art creation positively influences perceived ease of use.

2.2.4 Relationships Between Perceived Usefulness, Perceived Ease of Use, and Public Acceptance Intention

Zhou Bo et al.'s empirical research found that when the public perceives a new technology as easy to understand and use, and possessing strong practicality and usefulness, their acceptance intention significantly increases (Zhou, et al. 2017). Enhancing perceived usefulness and perceived ease of use fosters a more positive attitude towards new technologies or things. Based on this, the study framework is constructed (see Fig. 2), with the following hypotheses:

H4: Perceived usefulness positively influences public acceptance intention.

H5: Perceived ease of use positively influences public acceptance intention.

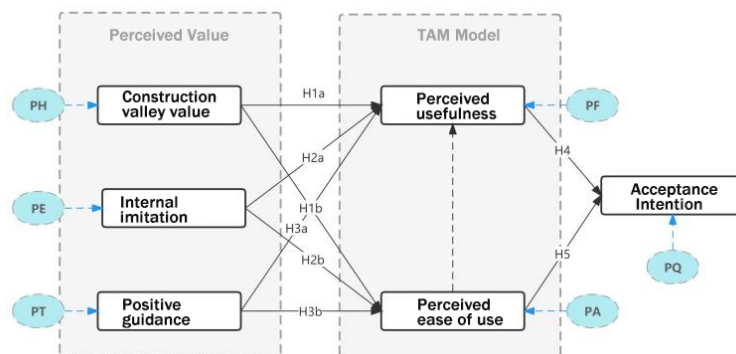


Fig.2 Framework of this study

3. Experimental Design

3.1 Questionnaire Design

To ensure reliability, all hypotheses and questionnaire items were based on relevant literature and public art theories, supplementing specific measurements for each variable. A seven-point Likert scale was used, with a small-scale pre-test conducted to refine and finalize 32 measurement items (see Table 1).

Table 1 item measurement report

Latent Variable	Measurement Items
Construction valley value	PH1 I think enjoying public art in the subway should broaden my knowledge PH2 I think looking at public art on the subway should teach me something PH3 I think that appreciating public art in the subway should improve my understanding of art PH4 I think the public works of art in the subway are more interesting to me because of their distinctiveness PH5 I thought I'd get more information by featuring public works of art in the subway
Internal imitation	PE1 I think looking at this piece of design makes me feel alive PE2 I think the integration of urban culture design works can better meet my spiritual expectations PE3 I think the city into the culture of design works can make me more Lenovo to myself PE4 I think the city into the culture of the design work more can arouse my resonance PE5 I think the combination of contextual design works can make me feel the characteristics of the times
Positive guidance	PT1 I thought that appreciating public art on the subway would improve my ride PT2 I think the public works of art in the subway should be able to bring me a good visual experience PT3 I am willing to recommend excellent design works to friends PT4 I think the design works which accord with my aesthetic appreciation can deepen the fusion of art and life PT5 I think that design works that are in line with my aesthetic will have a more positive impact on me
Perceived usefulness	PF1 I think the presence of public art on the subway should enhance the quality of the surroundings PF2 I think the design works that conform to my aesthetic should be able to better meet the needs of publicity and culture PF3 I think the design works that conform to my aesthetic should be better able to meet the needs of positioning and waiting PF4 I think designs that are in line with my aesthetic are more flexible in terms of presentation PF5 I think aesthetically pleasing designs are more effective in increasing space usage
Perceived ease of use	PA1 I don't think it takes too long to understand public art in the subway PA2 I think the appreciation of public works of art in the subway color and other

	aspects should be more clear and easy to understand PA3 I think there should be some degree of identity in the way the elements are extracted from public works of art in the subway PA4 I think designs that are in line with my aesthetic are more interactive PA5 I think it is easier to understand design works that conform to my aesthetic
Acceptance Intention	PQ1 I prefer to learn about public art in the subway that fits my aesthetic preference more than any other work PQ2 When I talk to friends about public art on the subway, I make it a priority to talk about works that fit my aesthetic PQ3 In the future, I will pay more attention to the public art and design works of the subway that conform to my aesthetic PQ4 In general, Subway public art designs that conform to my aesthetic are more likely to be recognized by me

3.2 Data Collection and Sample Description

A total of 252 samples were collected through both online (via "Questionnaire Star") and offline (face-to-face) methods. After data cleaning, the sample comprised 136 males (53.97%) and 116 females (46.03%), with 42.06% aged 26-30 and 29.37% aged 18-25. All participants had metro experience, with 67.06% riding 3-5 times weekly.

4. Data Report and Results Analysis

4.1 Data Reliability and Validity Testing

The analysis of the questionnaire data shows that the overall Cronbach's Alpha coefficient is 0.953, indicating excellent internal consistency; the reliability coefficients of each dimension are shown in Table 2. In terms of validity, the KMO value was 0.938 and Bartlett's sphericity test was significant ($X^2 = 5901.435$, $p = 0.000$). The data were suitable for factor analysis. Criteria ($CR > 0.6$, $AVE > 0.5$), all latent variable CR values are greater than 0.8, AVE values are greater than 0.5 (see Table 2), the convergence validity is good; there are six common factors with eigenvalues greater than 1 (see Table 3), the cumulative variance explanation rate is 76.179%, the dimension division is reasonable, and the factor loadings of all measurement items in the rotated component matrix are higher than 0.6, which indicates that the observation efficiency is high. In summary, the reliability and validity indicators of the questionnaire meet the requirements, so all the measurement items are retained.

Table 2 report of variable coefficients

Latent variable	measurement term	Cronbach's Alpha	CR	AVE
Construction valley value	PH1~PH5	0.920	0.892	0.624
Internal imitation	PE1~PE5	0.922	0.897	0.634
Positive guidance	PT1~PT5	0.913	0.905	0.655
Perceived usefulness	PF1~PF5	0.915	0.88	0.595
Perceived ease of use	PA1~PA5	0.912	0.897	0.636
Acceptance Intention	PQ1~PQ4	0.908	0.802	0.503

Table 3 principal component analysis report

measurement term	Construction valley value	Internal imitation	Positive guidance	Perceived usefulness	Perceived ease of use	Acceptance Intention
PE1	0.831					
PE4	0.810					
PE5	0.793					
PE3	0.784					
PE2	0.762					
PT1		0.886				
PT4		0.809				
PT3		0.801				
PT5		0.790				
PT2		0.755				
PH1			0.846			
PH2			0.808			
PH5			0.791			
PH4			0.752			
PH3			0.747			
PF1				0.817		
PF3				0.804		
PF5				0.768		
PF2				0.744		
PF4				0.720		
PA1					0.841	
PA4					0.839	
PA5					0.806	
PA2					0.782	
PA3					0.711	
PQ4						0.745
PQ1						0.712
PQ3						0.705
PQ2						0.673

4.2 Test of goodness of fit

In this study, the model's goodness of fit was comprehensively evaluated using multiple fit indices, including CMIN/DF, GFI, RMSEA, CFI, IFI, TLI, AGFI, and NFI. The chi-square goodness-of-fit test (CMIN/DF) yielded a value of 1.104, which is below the valley value of 3. The Goodness-of-Fit Index (GFI) was 0.906, exceeding the critical value of 0.9. The Root Mean Square Error of Approximation (RMSEA) was 0.020, lower than the valley value of 0.1. The Comparative Fit Index (CFI) was 0.906,

above 0.9; the Incremental Fit Index (IFI) was 0.993, above 0.9; and the Tucker–Lewis Index (TLI) was 0.993, also above 0.9. The Adjusted Goodness-of-Fit Index (AGFI) reached 0.889, higher than the valley value of 0.8, and the Normed Fit Index (NFI) was 0.935, above 0.9. Collectively, all indices met the recommended standards, indicating that the model demonstrated excellent adequacy and goodness of fit. The final results are presented in Table 4.

Table 4 fitness index report

Indicators	CMIN/DF	GFI	RMSEA	NFI	CFI	IFI	TLI	AGFI
Results	1.104	0.906	0.020	0.935	0.906	0.993	0.993	0.889
Standards	<3	>0.9	<0.1	>0.9	>0.9	>0.9	>0.9	>0.8
Fitness	Better	Better	Better	Better	Better	Better	Better	Better

4.3 Hypothesis Testing

The report of hypothesis testing is shown in table 5, and the final output model and path coefficients are shown in Figure 3. The Estimate value of the third column in table 5 represents the path coefficient between two latent variables, which can be used to judge the degree of interaction between latent variables. The path coefficients of all hypotheses are positive, and the other hypotheses are valid and have a positive impact, except for the hypothesis that the P value of H3B (positive guidance → perceived ease of use) is greater than 0.05.

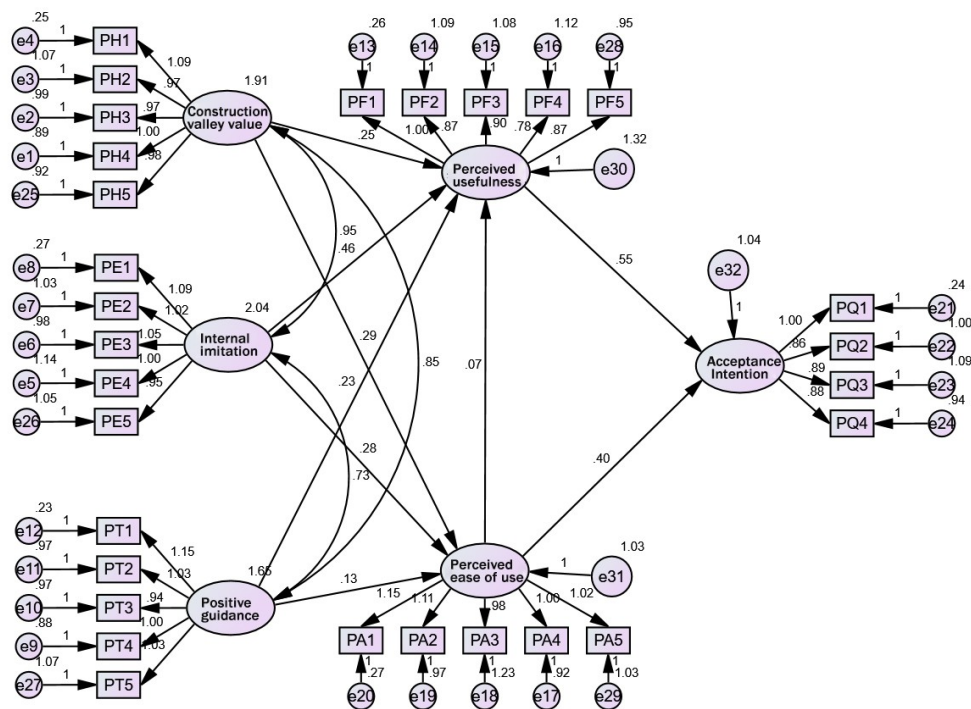


Fig.3 Model output path coefficient diagram

Table 5 hypothesis test report

Hypothesis	Path	Estimate	S.E	C.R.	Sig.	result
H1a	Building Valley → perceived usefulness	0.251	0.77	3.274	0.001	Support
H1b	Building Valley → perceived ease of use	0.289	0.66	4.396	***	Support
H2a	Internal imitation → perceived usefulness	0.457	0.074	6.191	***	Support
H2b	In-imitation → perceived ease of use	0.283	0.061	4.639	***	Support
H3a	Positive lead → perceived usefulness	0.235	0.075	3.133	**	Support
H3b	Positive lead → perceived ease of use	0.125	0.065	1.927	0.054	NO
H4	Perceived usefulness → acceptance intention	0.552	0.054	10.306	***	Support
H5	Perceived ease of use → acceptance intention	0.402	0.068	5.922	***	Support

(note: *** represents $p < 0.001$; ** represents $p < 0.01$; * represents $p < 0.05$)

4.4 Results Analysis

The verification results show that all hypotheses except H3b are supported, confirming the significant impact of perceived value on public acceptance intention. High path coefficients among latent variables indicate precise questionnaire semantic design, with certain measurement items (PQ1~PQ4, PF1~PF5, PA4~PA5, PH4~PH5, PE5, PT4~PT5) closely associated with aesthetic intention and prominent path coefficients. This suggests predictable patterns in public acceptance intention, with data analysis serving as an effective means to bridge the aesthetic gap between creators and audiences.

4.4.1 No Significant Impact of Positive Guidance on Perceived Ease of Use

The study confirms that H3b is not supported, indicating no significant association between positive guidance and public comprehension. This phenomenon stems from the public's innate empathy towards the social value and orientation of artworks—esthetic form and subject purpose alignment possess universality, as noted in Kantian aesthetics. Thus, design creation need not overly concern the public's interpretation ability of positive implications.

4.4.2 Construction valley value, Internal Imitation, and Perceived Usefulness

The research findings indicate that the construction of valley experiences and inner imitation are antecedent variables of perceived usefulness. Adjusting artworks based on these three dimensions can indirectly and effectively influence the public's acceptance intention toward metro public art. The path coefficients of perceived usefulness and perceived ease of use on acceptance intention were 0.55 and 0.40, respectively, suggesting that perceived usefulness exerts a slightly greater impact than perceived ease of use. Among all factors influencing perceived usefulness, "inner imitation" had the highest Estimate output value (0.457). Accordingly, the following recommendations can be made: in the creation of metro public art, priority should be given to representative elements such as urban culture, local humanistic characteristics, and the spirit of the times, so as to evoke empathy from the public in a short period of time. Furthermore, to provide the public with a satisfying aesthetic experience, it is essential to construct valley experiences during the acceptance process, as this form of engagement best aligns with the artwork's mode of existence and essential characteristics. Imagination and effective interactive formats are also core psychological mechanisms of the experience. It can be anticipated that when artworks allow sufficient imaginative space, fostering a psychological state of inner imitation during the acceptance process, the public's intention to accept metro public art will be significantly enhanced.

5. Conclusion

In Gadamer's hermeneutic theory, the term "prejudgment" is interpreted as the cognitive framework that a subject already possesses before understanding or engaging with an objective object. The public's horizon of expectation also exhibits a certain habitual nature; however, the introduction of new technologies or forms can disrupt these preexisting prejudgments. The Technology Acceptance Model (TAM) is among the most widely applied models in evaluating technologies, systems, and forms, yet when used in isolation, it can suffer from insufficient explanatory power and certain limitations. Therefore, this study integrates TAM with the perceived value theory, using metro public art as the point of entry to examine the public's intention to accept this art form. The findings indicate that public acceptance intention follows certain patterns, and these patterns can be effectively applied to the design practice of metro space art. It is foreseeable that, under the development trends of smart cities and cultural sustainability strategies, metro public art will become a favored approach for artistic engagement in rail transit construction, and will gradually emerge as an important form of art serving society. Based on TAM and perceived value theory, this article explores public acceptance intention from three dimensions: positive guidance, construction of valley experiences, and inner imitation. Of course, public acceptance intention is also influenced by factors such as self-efficacy, perceptual differences, and individual cognitive set. In the context of cultural confidence, metro public art should adapt to the needs of the new era, delve deeply into the public's aesthetic demands, and identify the intrinsic patterns of acceptance, so as to better reflect the public nature and social service function of public art, building a bridge between the artistic world and the real world.

References

- Liu, X.-C., & Chen, M.-J. (2021). A review of research on metro public art in China. *Art Education Research*, (21), 58–61.
- Zhong, Z.-H., & Li, L. (2022). Research and application of elderly mobile payment app design based on the peak-end rule. *Packaging Engineering*, 43(S1), 115–121.
- Zou, G.-S., & Liu, Y.-D. (2021). Artificial empathy and the paradigm shift in aesthetic psychology. *Gansu Social Sciences*, (5), 47–53.
- Zhou, W.-J. (2022). From "horizon of expectations" to "text-image suture": A re-interpretation of contemporary literary reception theory. *Seeking Truth*, (1), 73–80.
- Zhou, B., Zhou, L.-Q. & Wu, M.-Y. (2017). The impact of augmented reality on tourists' travel intentions in the context of smart tourism: An improved model based on TAM. *Business Economics and Management*, (2), 71–79.

First A. Author (Shuai Tai). This author was born in Inner Mongolia, China in 1996 and obtained a Master's degree in Design from Inner Mongolia Normal University in 2024. His research interests focus on public art, environmental design, and aesthetic theory.

Second author (Haijun Song). This author was born in Inner Mongolia, China in 1972 and holds a Master's degree in Design. Associate Professor at Inner Mongolia Normal University, his research interests focus on public art and nomadic aesthetics.