

Publication Date: 31 July 2024

Archs Sci. (2024) Volume 74, Issue 4 Pages 44-51, Paper ID 2024407.
<https://doi.org/10.62227/as/74407>

Research on Cultural Communication Change and Intelligent Technology Application under the Perspective of Metacosmos

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Abstract The meta-universe has opened up the spatial and temporal scope of cultural communication, spawned more new media platforms, and brought great changes to the communication of multiculturalism. Under the perspective of meta-universe, the study selects a cultural tourism VR design integrating intelligent technology as the research object, constructs the audience demand indexes for the application of intelligent technology in cultural communication, analyzes the data collected by combining the Kano model with the questionnaire, and divides the demand indexes for the application of intelligent technology in different functions. Finally, the path of intelligent technology application for cultural communication change is proposed. Each demand indicator of intelligent technology application is divided into 9 desired attributes, 5 required attribute zones and 4 charismatic attributes, among which the Better value and Worse absolute value of the desired attribute indicators are greater than 0.5, which need to be focused on. Except for the direct effect of technical support and perceived usefulness which is not valid, the hypotheses made in the study are all verified ($p < 0.05$), and the embodied environment of intelligent technology application has a significant positive effect on both embodied perception and embodied perception on cultural communication effect. Intelligent technology application can promote the change of cultural communication from the aspects of cultural content production, digital consumption and data collection.

Index Terms kano model, demand indicators, impact mechanisms, intelligent technology, cultural communication, meta-universe

I. Introduction

Meta-universe is a new generation of Internet applications arising from the fusion of multiple new technologies [1], which can realize spatio-temporal expansion on the basis of extended reality technology and digital twin technology [2], [3], human-machine fusion of digital people, natural people and robots on the carriers of AI and IoT [4], [5], and economic value-added on platforms such as blockchain, Web3.0, digital collections/NFT, etc. [6]. The meta-universe is gradually becoming a new type of industry with the iterative upgrading of new-generation information technology and the accelerated evolution of digitalization wave, which is rapidly becoming a windfall for the development of the manufacturing industry, financial industry, medical and health care, culture and art, education services, leisure and tourism, and other industry sectors [7]–[9].

Cultural communication is unique to human beings of all kinds of cultural elements of the transmission diffusion and migration successive transmission phenomenon, not only is the process of socialization of human existence performance, but also the process of mutual interpretation of the communicator and the audience [10], [11]. Human cultural communication media are usually divided into three eras: oral communication, written communication and electronic

communication [12]. In the era of oral communication, human communication is limited to face-to-face scenarios without the help of any media [13]. By the age of written communication, the medium of writing was created, which extended human language across time and space, but also lost the two biological components of communication, sound and vision [14].

Cultural communication is the phenomenon of transmission diffusion and migration succession of all kinds of cultural elements unique to human beings, which is not only the performance of the process of socialization of human existence, but also the process of mutual interpretation between the communicator and the audience [15], [16]. Human cultural communication media are usually divided into three eras: oral communication, written communication and electronic communication [17]. In the era of oral communication, human communication is limited to face-to-face scenarios without the help of any media [18]. By the age of written communication, the medium of writing was created to extend human language across time and space, but also lost the two biological components of communication, sound and sight [19]. Nowadays, in the era of electronic communication, with the development of media technology, human senses are greatly extended, and information based on vision and hearing is becoming more and more abundant, realizing that we can learn about the

events that are happening all over the world without going out of the house, anytime and anywhere [20]. Meta-universe inherits the characteristics of the electronic communication era, i.e., across time and space, and also further extends human sensory experience, not only visual and auditory, but also olfactory, tactile and other aspects, which is getting closer and closer to the real world of human beings [21], [22].

This study introduces the Kano model into the analysis of audience demand for the application of intelligent technology in cultural communication. Taking the meta-universe VR design of a cultural tourism as an example, we start from the four scene levels of visual performance layer, information construction layer, behavioral guidance layer, and emotional feedback layer of the scene interaction theory, and collate the audience's demand indexes for the use of the VR design of this cultural tourism in different scene levels, and set up each functional demand index. Positive and negative questions are set for each functional demand indicator to conduct a questionnaire survey, and the functional attributes of the functional demand points are generalized and summarized by calculating the impact coefficient of satisfaction and the impact coefficient of dissatisfaction. Then, from three perspectives of embodied environment, embodied perception and cultural communication effect, we construct the hypothetical model of the influence mechanism of intelligent technology application on cultural communication effect, calculate the path coefficients and significance of the model, and validate the direct effect of embodied environment on embodied perception, embodied perception on cultural communication effect, and the mediating effect of online presence, perceived usefulness, and perceived ease of use of intelligent technology application. Combined with the research results, the path of intelligent technology application for cultural communication change is finally elaborated.

II. Audience Needs for the Use of Intelligent Technologies in Cultural Communication

Based on the KANO model, this paper takes a cultural tourism VR design that integrates multi-media intelligent technology as an example to study the audience demand for the application of intelligent technology in cultural communication under the perspective of meta-universe, and divides the demand indicators into different functional attributes.

A. KANO model

Kano model is used to classify and prioritize user needs, which can reflect the non-linear relationship between product performance and user satisfaction based on the analysis of the impact of user needs on user satisfaction. It is found that different kinds of product quality characteristics play an important role in customer satisfaction. According to the relationship between different kinds of quality characteristics and customer satisfaction, product and service quality characteristics are divided into five categories: must-have needs (M), expectation needs (O), attractive needs (A), undifferentiated needs (I) and reverse needs (R).

- 1) **Must-have requirements (M)**
For the user, these needs must be satisfied, if this need is not satisfied, it will lead to a significant decrease in user satisfaction, even if this need is improved and optimized, it will not significantly improve user satisfaction. Therefore, designers should conduct research on the user's must-have needs in order to better satisfy the user's needs.
- 2) **Expected demand (O)**
When this demand is provided, user satisfaction will increase, and when it is not provided, user satisfaction will decrease. This is in the growth process of the demand, but also a reflection of the competitiveness of the demand. For this need designers should focus on improving the quality of this aspect in the process of practice.
- 3) **Charming needs (A)**
The user's intention is not reached, it is necessary to explore and insight. If this kind of demand is not provided, then user satisfaction will not decline, if this kind of demand is provided, then user satisfaction will be greatly improved. When the user has no requirements for the product, but the designer provides them with completely unexpected product attributes will bring surprise to the user, which in turn will increase user loyalty.
- 4) **Undifferentiated Requirements (I)**
Requirements that users don't care about at all and have no impact on user experience. User satisfaction will not change whether this requirement is provided or not, try to avoid this type of requirement.
- 5) **Reverse requirement (R)**
Users don't have this requirement at all, and user satisfaction decreases after it is provided. So when doing product design, you need to try to eliminate the reverse attribute.
- 6) **Question demand (Q)**
This refers to the users' contradictory answers, through the data analysis of the questionnaire, it is found that the users may have such and such answers due to their cognitive bias, attitude differences and different values, which may lead to incorrect understanding or incorrect filling in of the questionnaire, so this questionnaire is considered as an invalid questionnaire and the data should be deleted.

By categorizing the functional attributes, the Better-Worse coefficient was calculated to determine the importance of the user's needs, which was used to calculate the "Relative Satisfaction Ratio", i.e., the coefficient of influence of satisfaction and the coefficient of influence of dissatisfaction of the needs, which was calculated using the following formula:

$$\frac{\text{Better}}{\text{Worse}} = \frac{(A+O)}{(A+O+M+I)}, \quad \frac{\text{DST}}{\text{DST}} = \frac{(-1)(O+M)}{(A+O+M+I)} \quad (1)$$

Typically, Better is viewed as a positive functional attribute that enhances user satisfaction and thus better meets their

needs. Negative, on the other hand, indicates that user satisfaction would not be enhanced without this feature. As the number of positives increases, the enhancement effect on user satisfaction increases, leading to a faster rate of increase. Worse can be considered as a post elimination dissatisfaction coefficient, usually negative, indicating that failure to provide a particular functional attribute will result in a decrease in the user's satisfaction. The smaller the positive value, the weaker the impact effect of reduced satisfaction and the slower the decline. As the value increases in a negative direction, the extent of its effect on satisfaction increases and the rate of decline accelerates.

B. Establishment of demand indicators

The audience demand indicators of intelligent technology application for cultural communication are divided into four levels: visual performance layer, information construction layer, behavioral guidance layer, and emotional feedback layer.

The visual performance layer includes ancient interface style A1, reasonable and clear interface layout A2, visual form of meta-universe A3, and multi-sensory form integration A4.

The information construction layer includes the classification of guided tour information A5, attraction search A6, attraction introduction A7, attraction collection A8, route navigation guidance design A9, schematized non-heritage knowledge content A10, and non-heritage craft VR game design A11.

Behavioral guidance layer includes craft game level setting A12, novice interaction guidance A13, achievement achievement feedback A14, and points benefit incentive A15.

Emotional feedback layer includes attraction evaluation A16, offline activity feedback A17, and sharing and exchange community A18.

C. Questionnaire design

The questionnaire of this survey is divided into two parts to set up, the first part is mainly to understand the basic information of the questionnaire respondents. The second part mainly investigates the audience's satisfaction with each functional requirement point, and each functional requirement indicator is set up with two question modes: positive and negative.

A total of 120 questionnaires were distributed online, and 109 questionnaires were recovered after preliminary screening to eliminate those with invalid or illogical answers, with a validity rate of 90.83%.

D. Analysis of audience demand indicators

Based on the results of the questionnaire derived from the positive and negative questions, they were corresponded to the Kano evaluation cross-reference table, which ultimately yielded the quality attributes to which each demand indicator belongs.

Table 1 shows the categorization results of each requirement indicator. It summarizes the number of design demand points under each attribute, of which the required attributes

Number	Positive and negative results					Attribute classification
	A	O	M	I	R	
A1	34	46	11	15	3	O
A2	26	29	38	14	2	M
A3	36	22	18	30	3	A
A4	24	35	28	21	1	O
A5	24	14	42	26	3	M
A6	27	20	45	14	3	M
A7	23	30	41	11	4	M
A8	22	29	40	15	3	M
A9	29	27	37	14	2	M
A10	29	40	28	10	2	O
A11	35	30	24	17	3	A
A12	22	32	15	38	2	I
A13	28	25	39	15	2	M
A14	12	39	25	31	2	O
A15	35	25	24	23	2	A
A16	23	30	36	17	3	M
A17	27	37	22	20	3	O
A18	38	28	20	23	0	A

Table 1: Categories of requirements indicators

have the most demand points, accounting for 44.44%, followed by the desired attributes accounting for 27.78%.

There are 8 required attributes M, which are interface layout reasonable and clear A2, "guide information classification A5, attraction search A6, attraction introduction A7, attraction collection A8, route navigation guide design A9, novice interaction guide A13, attraction evaluation A16.

There are 5 desired attributes O, which are ancient interface style A1, multi-sensory form integration A4, schematized non-heritage knowledge content A10, achievement achievement feedback A14, and offline activity feedback A17.

Attractive attribute A has 4, which are visual form of meta-universe A3, VR game design of non-heritage crafts A11, points benefit incentive A15, and sharing and exchange community A18.

There is 1 undifferentiated attribute I, which is craft game level setting A12.

The satisfaction coefficient is calculated to visualize from the data the importance of each demand indicator for the sample VR design of the cultural tourism.

The sensitivity values of each demand indicator are shown in Table 2. Among the 18 demand indicators, 72.22% of the indicators have a satisfaction impact coefficient greater than 0.5, indicating that the majority of people are satisfied when the sample cultural tourism VR design has this function. 77.78% of the indicators have a dissatisfaction impact coefficient with an absolute value greater than 0.5, indicating that the majority of people are dissatisfied when the sample cultural tourism VR design does not have this function.

Based on the above sensitivity values, it can be summarized that the absolute values of the satisfaction impact coefficients and dissatisfaction impact coefficients of the demand indicators are both concentrated between 0.358 and 0.755. In order to express the sensitivity of each demand indicator more intuitively, an in-depth analysis was carried out with the help of Better-Worse sensitivity scatter plot. Where the horizontal coordinate represents the satisfaction impact coefficient, i.e.

Number	Better value	Worse value	Number	Better value	Worse value
A1	0.755	-0.538	A10	0.645	-0.636
A2	0.514	-0.626	A11	0.613	-0.509
A3	0.547	-0.377	A12	0.505	-0.439
A4	0.546	-0.583	A13	0.495	-0.598
A5	0.358	-0.528	A14	0.477	-0.598
A6	0.443	-0.613	A15	0.561	-0.458
A7	0.505	-0.676	A16	0.501	-0.623
A8	0.481	-0.651	A17	0.604	-0.557
A9	0.523	-0.598	A18	0.606	-0.440

Table 2: The sensitivity of each demand index

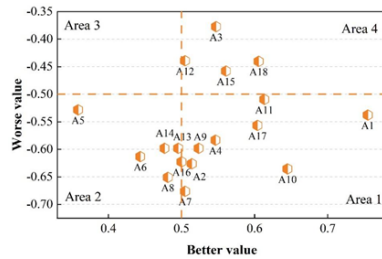


Figure 1: The distribution of the sensitivity scatter point of Better-Worse

Better value, and the vertical coordinate represents the dissatisfaction impact coefficient, i.e. Worse value.

The Better-Worse sensitivity scatter distribution is shown in Figure 1. The sensitivity scatter plot is divided into four quadrants:

The first region is the desired attributes, the absolute values of Better and Worse in this region are both higher than 0.5, and a total of 50% of the demand indicators are located in the first region, which should be focused on these functional indicators, and together they will drive the improvement of audience satisfaction.

The second distribution region is the required attribute, the absolute value of Worse is higher than 0.5, the value of Better is relatively lower than 0.5, and a total of 5 demand indicators are located in this region. The functions in this region are considered by the audience to be required functions, and the satisfaction effect generated by the provision of this function is not significant.

The third distribution region is no difference attribute, the Better value and Worse absolute value of this region are within 0.5, that is, the audience has no obvious demand for the function in this quadrant.

The fourth distribution region is the charm attribute, the Better value of this region is higher than 0.5, and the absolute value of Worse is lower than 0.5, a total of 4 demand indicators are located in this region, when the VR design provides this function the audience has a high degree of satisfaction, and vice versa does not produce a large degree of dissatisfaction, and improving the function in this region helps to improve the viscosity of the audience.

III. Impact of Smart Technology Applications on Cultural Communication

On the basis of analyzing the audience needs of intelligent technology application in cultural communication, this part conducts quantitative research on the mechanism of intelligent technology application affecting cultural communication by proposing research hypotheses.

A. Hypothetical modeling of impact mechanisms

In this paper, a hypothetical model of the impact mechanism of intelligent technology application on cultural communication is constructed from three perspectives: embodied environment, embodied perception and cultural communication effect, with embodied environment (online interaction, technical support, resource quality) as latent variables, embodied perception (presence, usefulness and ease of use) as mediating variables, and cultural communication effect (satisfaction and intention to continue to use) as explicit variables. The following hypotheses are proposed:

- H11: Online interaction has a significant positive effect on perceived online presence.
- H12: There is a significant positive effect of online interaction on perceived ease of use.
- H13: There is a significant positive effect of online interaction on perceived usefulness.
- H14: There is a significant positive effect of perceived ease of use on perceived usefulness.
- H21: Technical support has a significant positive effect on perceived online presence.
- H22: There is a significant positive effect of technical support on perceived ease of use.
- H23: There is a significant positive effect of technical support on perceived usefulness.
- H31: There is a significant positive effect of resource quality on perceived online presence.
- H32: Resource quality has a significant positive effect on perceived usefulness.
- H33: There is a significant positive effect of resource quality on perceived ease of use.
- H41: There is a significant positive effect of online presence on satisfaction.
- H42: There is a significant positive effect of online presence on intention to continue using.
- H43: Satisfaction has a significant positive effect on intention to continue using.

- H51: Perceived usefulness has a significant positive effect on satisfaction.
- H52: Perceived usefulness has a significant positive effect on intention to continue using.
- H61: Perceived ease of use has a significant positive effect on satisfaction.
- H62: There is a significant positive effect of perceived ease of use on intention to continue using.

Still using a cultural tourism VR design in Chapter 2 as an example, questionnaire questions were designed based on the above assumptions, which were distributed and recovered together with a survey on audience needs for the application of intelligent technologies in cultural communication.

B. Test of relevant hypotheses

1) Model direct effect analysis

Path coefficient is to verify the relationship between the potential variables of the constructed model, i.e., to test the research hypotheses, coefficient value positive and negative indicates the positive and negative impact of the relationship between the potential variables, through the Bootstrap method of significance testing of the hypothesis path can be obtained between the variables of the influence of coefficient value, in order to determine the extent of the influence is significant, whether the research hypothesis is valid.

The results of the direct effects of the latent variables are shown in Table 3. There is 1 group of direct effect paths of the model that does not hold, i.e., technical support \rightarrow perceived usefulness, and the significance p-value of its path coefficient test is greater than 0.05, which does not meet the level of significance, and H23 hypothesized paths do not hold. The rest of the hypothesized path coefficient values are less than 0.05, i.e., they reach the significance level, implying that the hypothesized direct effects are valid.

2) Analysis of model indirect effects

The Bootstrap method of the application software was used to conduct the indirect effect test of the model path, which was intended to test the indirect effect of embodied perception between the embodied environment and the cultural communication effect. Specifically, the three dimensions of online presence, perceived usefulness, and perceived ease of use were analyzed for indirect effects with the linkage paths between the dimensions of embodied environment and the dimensions of cultural communication effects, respectively.

1) Analysis of the indirect effect of online sense of presence

The results of the indirect effect test of online sense of presence are shown in Table 4, the indirect effect value test of online sense of presence between online interaction, technical support and resource quality, as well as satisfaction and intention to continue to use all reach the significant standard ($p < 0.05$), indicating that online sense of presence has a significant indirect effect

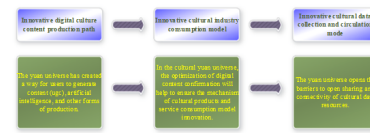


Figure 2: The intelligent technology application path of cultural communication change

between the embodied environment and the effect of cultural communication.

2) Analysis of indirect effects of perceived usefulness

The results of the indirect effect test of perceived usefulness are shown in Table 5, and the indirect effect value test of perceived usefulness between online interaction, technical support and resource quality, as well as satisfaction and intention to continue to use all reach the significant standard ($p < 0.05$), indicating that perceived usefulness has a significant indirect effect between embodied environment to cultural communication effect.

3) Indirect effect analysis of perceived ease of use

The results of the indirect effect test of perceived ease of use are shown in Table 6, and the indirect effect values of perceived ease of use between online interaction, technical support and resource quality, as well as satisfaction and intention to continue to use all meet the significant criteria ($p < 0.05$), indicating that perceived ease of use has a significant indirect effect between embodied environment and cultural communication effect.

IV. Pathways for the Application of Intelligent Technologies for the Transformation of Cultural Communication

By integrating and innovating new-generation information technologies such as artificial intelligence, blockchain, cloud computing, virtual reality and Internet of Things, Yuan Universe breaks through the barriers between the real physical space and the virtual digital space, and builds a virtual world that carries the functions of content creation, asset trading, public service and cultural entertainment. This virtual world has the characteristics of spatial and temporal expansion, high intelligence, strong empowerment, etc., which is expected to eliminate the traditional cultural industry time and space constraints, single mode, low revenue efficiency and other dilemmas. The intelligent technology application path of cultural communication change is shown in Figure 2, and the innovative application of cultural meta-universe will empower the digital transformation and upgrading of cultural communication and accelerate the shaping of new modes of cultural communication development and new industry.

A. Innovative digital cultural content production pathways

Traditionally, the cultural industry has adopted a dichotomous model, with professionally produced content (PGC) as the path of cultural content production, with different participants

Study hypothesis	Path value	T-test	P	Support
Online presentation → Persistent intent	0.373	5.89	0.00	Yes
Online presentation → Satisfaction	0.201	2.27	0.00	Yes
Online interaction → Online presentation	0.295	7.87	0.01	Yes
Online interaction → Perceptively easy-to-use	0.411	5.93	0.05	Yes
Online interaction → Perceptively useful	0.217	5.31	0.02	Yes
Perceptively easy-to-use → Perceptively useful	0.247	1.57	0.01	Yes
Perceptively easy-to-use → Persistent intent	0.234	4.81	0.03	Yes
Perceptively easy-to-use → Satisfaction	0.189	2.44	0.03	Yes
Perceptively useful → Satisfaction	0.404	6.02	0.01	Yes
Technical support → Online presentation	0.188	3.46	0.01	Yes
Technical support → Perceptively easy-to-use	0.210	7.56	0.02	Yes
Technical support → Perceptively useful	0.301	4.74	0.07	No
Satisfaction → Persistent intent	0.193	5.92	0.03	Yes
Resource quality → Online presentation	0.114	7.39	0.00	Yes
Resource quality → Perceptively easy-to-use	0.106	7.84	0.01	Yes
Resource quality → Perceptively useful	0.361	1.75	0.00	Yes
Online presentation → Persistent intent	0.407	5.73	0.00	Yes

Table 3: The direct effect of the potential variable

Assumption path	B	SD	T-test	P
Online interaction → Online presentation → Satisfaction	0.065	0.013	3.622	0.004
Online interaction → Online presentation → Persistent intent	0.072	0.018	3.575	0.027
Technical support → Online presentation → Satisfaction	0.065	0.026	4.499	0.021
Technical support → Online presentation → Persistent intent	0.105	0.022	4.245	0.010
Resource quality → Online presentation → Satisfaction	0.063	0.029	3.320	0.002
Resource quality → Online presentation → Persistent intent	0.075	0.016	3.731	0.005

Table 4: Indirect effect test results of online presentation

Assumption path	B	SD	T-test	P
Online interaction → Perceptively useful → Satisfaction	0.052	0.016	3.201	0.003
Online interaction → Perceptively useful → Persistent intent	0.101	0.012	3.711	0.034
Technical support → Perceptively useful → Satisfaction	0.092	0.015	4.069	0.019
Technical support → Perceptively useful → Persistent intent	0.039	0.017	3.625	0.034
Resource quality → Perceptively useful → Satisfaction	0.029	0.021	4.197	0.015
Resource quality → Perceptively useful → Persistent intent	0.081	0.023	4.206	0.025

Table 5: Indirect effect test results of Perceptively useful

Assumption path	B	SD	T-test	P
Online interaction → Perceptively easy-to-use → Satisfaction	0.075	0.024	1.149	0.015
Online interaction → Perceptively easy-to-use → Persistent intent	0.047	0.033	1.867	0.004
Technical support → Perceptively easy-to-use → Satisfaction	0.071	0.027	3.374	0.011
Technical support → Perceptively easy-to-use → Persistent intent	0.026	0.021	2.401	0.019
Resource quality → Perceptively easy-to-use → Satisfaction	0.029	0.034	3.658	0.037
Resource quality → Perceptively easy-to-use → Persistent intent	0.053	0.031	3.310	0.018

Table 6: Indirect effect test results of Perceptively easy-to-use

in "production" and "consumption", and a clearer boundary between the two segments. Since the Internet era, the boundaries between the two segments have begun to blur, especially as the mobile Internet has solved the problem of channels for consumers to participate in cultural content production. On the one hand, the meta-universe continues the platform mechanism of the consumer Internet era, and on the other hand, it opens up widely available digital tools for consumers, builds a new supply mechanism for products and services of the cultural communication industry, and innovates produc-

tion methods such as user-generated content (UGC), artificial intelligence-generated content (AIGC), etc. In the cultural meta-universe, PGC is the most widely used content in the world. In the cultural meta-universe, several types of paths, including PGC, UGC and AIGC, have been integrated and developed, exploring the formation of a new path for the production of digital content for cultural communication.

B. Innovative modes of consumption of cultural communication

On the basis of innovative digital content production path, YuanCosmos further solves the problems of lack of value assessment mechanism for consumer Internet digital content and imperfect payment infrastructure, which can effectively protect the interests of creators. Based on the blockchain identification system, distributed digital identity system and other technical modes, YuanCosmos confirms the right to authenticate the personalized cultural content produced by users, guarantees the scarcity of digital content and the pricing right of users, and promotes the role of the cultural industry to change from a "contributor" to a "creator". The role of the cultural industry has changed from "contributor" to "creator". In the cultural meta-universe, the optimization of digital content rights will help to reasonably distribute digital content production revenues in the cultural industry chain, and form a mechanism to guarantee the innovation of cultural product and service consumption patterns.

C. Innovative cultural data collection and circulation methods

The meta-universe empowers the digital development of cultural communication to form a positive feedback mechanism. On the one hand, the digitization of the cultural industry has achieved initial results, and has collected and stored considerable data resources, creating the elemental foundation for the transformation and upgrading of cultural communication empowered by meta-universe technology. On the other hand, Metaverse brings new digital content production and consumption modes for the cultural industry, breaks down the barriers of open sharing and interconnection of cultural data resources, gives new kinetic energy to the digital transformation of cultural communication, and accelerates the digitization process of traditional cultural industry, especially cultural heritage.

V. Conclusion

Under the perspective of meta-universe, this dissertation takes a cultural tourism VR design integrating intelligent technology as the research object, explores the audience demand of intelligent technology application in cultural communication based on Kano model, and then constructs hypothesis model and carries out relevant hypothesis verification around the impact of intelligent technology application on cultural communication. The results are as follows:

- 1) The absolute value coefficients of satisfaction and dissatisfaction impacts of the audience's demand indicators of various aspects of the application of intelligent technology in cultural communication are concentrated between 0.358 and 0.755. 50% of the demand indicators of the Better value and the absolute value of the Worse value are greater than 0.5, which are located in the desired attribute zone, and the application of intelligent technology in cultural communication should focus on

these demand indicators. The demand indicators of Required Attribute Zone and Charming Attribute are 5 and 4 respectively.

- 2) Except for the non-significant direct effect between technical support and perceived usefulness, the remaining 17 direct effect hypotheses are positive and significant ($p < 0.05$), indicating that the embodied environment of intelligent technology application is an important dimension for cultural receiving subjects to obtain embodied perception, and that embodied perception is an important factor affecting the effect of cultural communication. Meanwhile, embodied perception plays a mediating role between embodied environment to cultural communication effect ($p < 0.05$).
- 3) With the popularization of the meta-universe, the meta-universe will profoundly affect the structure and ecology of the entire cultural communication field, and can innovate the content production, digital consumption and data collection of the cultural industry, and is expected to promote the change of cultural communication by using the cultural meta-universe as an innovative carrier. At the same time, the fusion of reality and reality in the meta-universe brings new risks such as cultural conflict, capital speculation, intellectual property rights, security governance, etc., and its industrial ecology and governance mechanism need to be further improved.

Funding

- 1) 2023 Humanities and Social Sciences Research Project of the Ministry of Education: Research on Discourse Transformation and Intelligent Dissemination of Chinese Excellent Family Training Classics (Project Number: 23YJAZH114) (Provincial and ministerial level).
- 2) Huzhou Vocational and Technical College, the first batch of "double leaders" teachers' Party branch book studio construction unit project.

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References

- [1] Arjanto, P., Nahdiyah, U., & Utami, M. S. (2024). The intersect of metaverse, education and mental health: an in-depth analysis. *Journal of Public Health, 46*(1), e183-e184.
- [2] Pathania, Y. S. (2023). The scope of metaverse in dermatology. *International Journal of Dermatology, 62*(6), 831-832.
- [3] Peukert, C., Weinhardt, C., Hinz, O., & van der Aalst, W. M. (2022). Metaverse: how to approach its challenges from a BISE perspective. *Business & Information Systems Engineering, 64*(4), 401-406.
- [4] Cordero Jr, D. A. (2024). What a wonderful world? The downside of the metaverse phenomenon. *Journal of Public Health, 46*(1), e206-e207.
- [5] Canete, J. J. O. (2024). Metaverse: making our world a better place. *Journal of Public Health, 46*(2), e342-e342.

- [6] Dobrowolski, Z., Drozdowski, G., Panait, M., & Babczuk, A. (2022). Can the economic value added Be used as the universal financial metric?. *Sustainability*, 14(5), 2967.
- [7] Corpuz, J. C. (2023). Metaverse: a public health concern?. *Journal of Public Health*, 45(3), e591-e591.
- [8] Kshetri, N. (2023). The economics of the industrial metaverse. *IT Professional*, 25(1), 84-88.
- [9] Pietris, J., Tan, Y., & Chan, W. O. (2023). Health care in the metaverse. *The Medical Journal of Australia*, 219(1), 41-41.
- [10] Jukka, M., Andreeva, T., Blomqvist, K., & Puumalainen, K. (2017). A cross-cultural perspective on relational exchange. *Journal of Business & Industrial Marketing*, 32(7), 937-950.
- [11] Martin, B. G. (2022). The Rise of the Cultural Treaty: Diplomatic Agreements and the International Politics of Culture in the Age of Three Worlds. *The International History Review*, 44(6), 1327-1346.
- [12] Machwate, S., Bendaoud, R., Henze, J., Berrada, K., & Burgos, D. (2021). Virtual exchange to develop cultural, language, and digital competencies. *Sustainability*, 13(11), 5926.
- [13] Gómez-Cram, R., & Grotteria, M. (2022). Real-time price discovery via verbal communication: Method and application to FedSpeak. *Journal of Financial Economics*, 143(3), 993-1025.
- [14] Gui, M., & Büchi, M. (2021). From use to overuse: Digital inequality in the age of communication abundance. *Social Science Computer Review*, 39(1), 3-19.
- [15] Adriani, F., Matheson, J. A., & Sonderegger, S. (2018). Teaching by example and induced beliefs in a model of cultural transmission. *Journal of Economic Behavior & Organization*, 145, 511-529.
- [16] Loverdo, C., & Viciano, H. (2018). Cultural transmission and biological markets. *Biology & Philosophy*, 33(5-6), 40.
- [17] Tennie, C., Premo, L. S., Braun, D. R., & McPherron, S. P. (2017). Early stone tools and cultural transmission: Resetting the null hypothesis. *Current Anthropology*, 58(5), 652-672.
- [18] Della Lena, S., & Panebianco, F. (2021). Cultural transmission with incomplete information. *Journal of Economic Theory*, 198, 105373.
- [19] Marshall, R., & WoonBong, N. (2003). An experimental study of the role of brand strength in the relationship between the medium of communication and perceived credibility of the message. *Journal of Interactive Marketing*, 17(3), 75-79.
- [20] Bogacki, P. (2008, March). Multivariable Calculus Virtual Office Hours in a Metaverse. In CDROM Proceedings of the Twentieth Annual International Conference on Technology in Collegiate Mathematics, San Antonio, Texas (p. C015).
- [21] Ding, S., Kou, L., & Wu, T. (2022). A GAN-based intrusion detection model for 5G enabled future metaverse. *Mobile Networks and Applications*, 27(6), 2596-2610.
- [22] Xu, X., Zou, G., Chen, L., & Zhou, T. (2022). Metaverse space ecological scene design based on multimedia digital technology. *Mobile Information Systems*, 2022(1), 7539240.

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