Research on Innovative Development of Jingdezhen Ceramics Based on Big Data

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Abstract. The research focuses on the development of Jingdezhen's ceramic industry. Based on preliminary research, an evolutionary game model of Jingdezhen ceramics' self media enterprise consumer 'is established. Using system dynamics simulation methods, this study explores how corporate cultural innovation affects the progress of Jingdezhen's ceramic industry under the big data of self media. Through analysis, it can be concluded that in the current environment, despite the self media big data industry, enterprises are more inclined towards physical operations, and consumers have a greater willingness for innovative ceramics. Finally, based on the simulation results, some suggestions for the innovative development of Jingdezhen ceramics were proposed.

Keywords: Self media; big data; Ceramics; Cultural relic protection.

1 Introduction

Since the 18th National Congress of the Communist Party of China, the country has attached great importance to inheriting and promoting it excellent traditional Chinese culture. The report of the 20th National Congress of the Communist Party of China clearly pointed out that "adhering to and developing Marxism must be combined with the excellent traditional culture of China. The excellent traditional culture of China has a long and profound history, and is the wisdom crystallization of Chinese civilization." Ceramic culture is an important part of the excellent traditional culture of China, and Jingdezhen, a city known as the "millennium porcelain capital," has its ceramic culture shining brightly and attracting much attention. In October 2023, General Secretary Xi Jinping pointed out during his inspection and research of Jingdezhen City that it is necessary to gather talents from all walks of life, strengthen creative design and research and development innovation, further expand and strengthen the ceramic industry, and polish the beautiful business card of "Millennium Porcelain Capital" even brighter.

However, with the development of the market economy and the growth of the internet economy. The physical industry of ceramics is increasingly being impacted, so this article conducts simulation analysis on whether multimedia big data and the ceramic

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industry can be combined for development, in order to provide practical suggestions for the sustainable development of the ceramic industry.

2 Journal Reviewed

At present, the development of various industries has become a focal point of academic research and practical discussions both domestically and internationally. Scholars from different fields have delved into multiple industries, exploring their growth patterns, competitive advantages, and sustainable development strategies. Among these extensive studies, the ceramic industry has attracted significant attention. For instance, statistical data shows that in the past decade, over 2,000 academic papers have been published globally, specifically analyzing the ceramic industry, highlighting its crucial position in both economic development and cultural heritage.

These numerous research works primarily concentrate on the factors influencing the development of the ceramic industry. Researchers have examined various aspects, including technological innovation, market demand fluctuations, and the impact of policies. Technological advancements, such as the introduction of 3D printing in ceramic production, have revolutionized traditional manufacturing processes, improving production efficiency and product quality. Meanwhile, market demand has shifted with changing consumer preferences, driving the ceramic industry to adapt and innovate.

Contemporary China, standing at the intersection of a diverse and three-dimensional cultural background, witnesses the rapid expansion of the cultural industry into various fields. As an important part of Chinese traditional culture, the dissemination of Jingdezhen ceramic culture is now confronted with unprecedented challenges and opportunities. With the rapid development of industrialization and marketization, traditional porcelain making techniques and cultural inheritance are under severe impact. For example, some traditional workshops have closed down due to the inability to compete with large-scale industrial production, and the number of craftsmen proficient in ancient porcelain making techniques is gradually decreasing.

However, these challenges also bring opportunities. The integration of modern technology and traditional ceramic culture can create new forms of expression. To address these issues, it is essential to encourage people to strengthen the protection of ceramic culture inheritance. This can be achieved by promoting the cultivation of professional talents, establishing cultural heritage protection mechanisms, and enhancing public awareness of cultural protection. Additionally, effectively combining ecological restoration, urban transformation, and ceramic culture revival is crucial. For example, through the development of ceramic - themed cultural tourism, Jingdezhen can not only promote ecological and urban construction but also better promote the inheritance and development of ceramic culture.

Digital media breaks the limitations of time, space, and geography, bringing audiences closer together with strong interactivity. It can better promote ceramic culture and enhance cultural subjectivity. From this theoretical perspective, Jingdezhen ceramics, as one of the representatives of traditional Chinese culture and art, took the lead in combining the characteristics of ceramic patterns with modern culture. At present, some

characteristic ceramic pattern products only roughly replicate ancient related patterns and have not undergone secondary creation that integrates with modern culture. There is still great space for modern packaging design and cultural and creative production of ceramic patterns.

For the industrial industry itself, the resilience and security of the industrial chain not only does it come from product manufacturing capabilities and market influence, but it also relies on the underlying material support. Therefore, the industrial industry needs to implement strategies that conform to the development of the times to support high-quality industrial development [1]. In the context of the new era of digital economy, the role of industrial Internet in improving the innovation performance of manufacturing enterprises is closely related to the speed of information transmission [2], so new media big data has become an important means to promote the quality and efficiency of traditional enterprises [3].

Numerous studies have shown that innovation capability can affect industrial development. Under the new wave of technological and industrial revolution, the digital economy has become a new trend in China's economic development in the new era. In the context of the digital economy, in order to promote high-quality development of China's economy, it is necessary to grasp the expansion direction of growth factors, adapt to the trend of transformation of growth modes, actively cultivate new entities, improve innovation capabilities, strengthen innovation drive, and accelerate the construction of new digital infrastructure [4]. For Jingdezhen's ceramic industry, only by gathering talents from all walks of life, strengthening creative design and R&D innovation, forming a strong local artistic innovation atmosphere, activating the local innovation consciousness [5], and further making the ceramic industry bigger and stronger, can the "Millennium Capital of Porcelain" be brighter [6].

Overall, a series of empirical studies have been conducted in China to investigate

The influencing factors of the development of the ceramic industry. Despite the abundance of related research, there is still room for expansion and refinement. This article will deeply analyze the impact of corporate culture innovation on the development of Jingdezhen ceramic industry under the new media big data.

3 Data Collection

Regarding the first type of questionnaire, this article adopts two-stage sampling PPS sampling will be used in the first stage, and equal sampling will be conducted in the second stage. In the first stage, with the help of the auxiliary variable of the number of permanent residents in each urban area of Jingdezhen, this paper divides four districts and counties in Jingdezhen into four layers: Leping City, Fuliang County, Zhushan District, and Changjiang District. According to the population size ratio of each district and county, W software is used to implement the unequal probability sampling, and two districts and counties are selected. Two pseudorandom numbers are generated using the runif function, and Leping City and the Pearl River District are finally selected. In the second stage, the same number of questionnaires were collected from Leping City and the Pearl River District respectively.

4 Simulation Model Construction

Select multimedia, ceramic manufacturers (enterprises), and consumers as the game subjects, and assume that all three types of subjects are bounded rationality. Through research, it can be found that the application of multimedia big data is the implementation situation will have a direct impact on the innovation benefits and costs of the enterprise, and indirectly affect whether the enterprise innovates. Therefore, the main consideration here is whether the enterprise is innovative. Assuming that the strategic choice space of the enterprise is {innovation, no innovation}. And the proportion of innovative enterprises in the market is μ, while the proportion of non innovative enterprises is 1- μ (or the probability of enterprises choosing innovation is μ).

System dynamics can be achieved through simulation of models and structures. Intuitively reflecting the dynamic changes of various subjects and variables in the system. Widely used in simulations that require analyzing the impact of policies on society

Real simulation research. Based on the model established in the previous text and the replication dynamic equation of "self media producer consumer".

After completing the establishment of the SD flow chart model, it can be combined with reality. In the current situation, apply system dynamics to simulate the model, and simulate the evolution and evolution process of various subject strategies. By analyzing variables that have a significant impact on the system, key factors that have a significant impact on the actual situation can be identified.

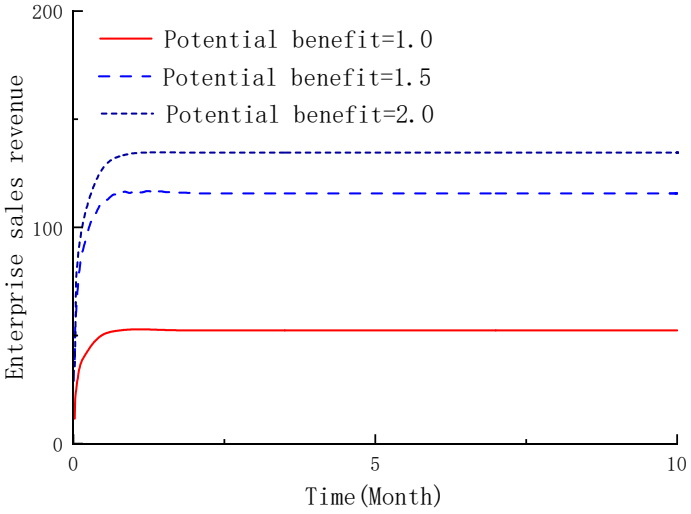
The basic parameters of Vensim are set as follows: Initial time is 0 and the FINAL TIME is 72 (i.e. 6 years), TIME STEP=0.25， Units for Time: Month.

Initial value setting of variable parameters: Through preliminary questionnaire surveys. It can be considered that the government's property protection coverage is relatively low, and at the same time, the innovation motivation of enterprises is small. Therefore, the initial coverage rate and average innovation probability are set at 0.2. At the same time, it is believed that consumers have no idea whether ceramics are innovative or not.Has there been a clear preference for consumption? Should we set the initial purchase value to 0.4. For the parameters of benefits and costs, refer to the relative size and set them accordingly. For example, if the production cost of ceramics in the enterprise is 1, the benefit when the enterprise is not innovative is 1.4, and the innovation benefit SP2 should be higher than the benefit when it is not innovative, then set it to 1.6.

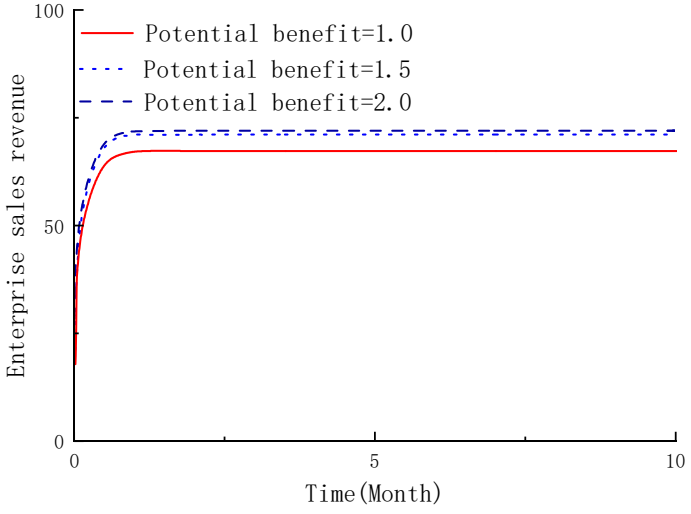
The cost of consumers purchasing innovative or non innovative ceramics is the profit of the enterprise's innovative or non innovative ceramics. Through research, it was found that the majority of ceramic sales in Jingdezhen are still dominated by small workshops. Therefore, it can be concluded that in this study, enterprises the taxes of the industry are all small general taxpayers. The government's taxation on innovative or non innovative ceramics refers to the "Enterprise Income Tax Law of the People's Republic of China" and the "Announcement of the State Administration of Taxation No. 13 of 2022" issued by the Ministry of Finance, which states that "the portion of annual taxable income exceeding 1 million yuan but not exceeding 3 million yuan shall be reduced by 25% and included in the taxable income, and the enterprise income tax shall

be paid at a rate of 20%", and the enterprise income tax rate shall be determined as 20%.

5 Result Analysis



(a) Sales revenue of ceramic enterprises after the addition of new media



(b) Sales revenue of ceramic enterprises before the addition of new media

Fig. 1. The sales revenue of the enterprise before and after the addition of new media.

Figure 1 shows the sales revenue of the enterprise before and after the addition of new media. From the graph, it can be seen that with the application of new media big data, the sales revenue of ceramic enterprises has significantly increased, and with the increase of potential revenue, the increase in sales revenue of enterprises is more obvious

6 Conclusions

This article conducts simulation analysis on new media enterprise consumer and verifies it with examples. It was found that the simulation method proposed in this article can effectively simulate the relationship between the three, and it was found that with the application of new media big data, the sales revenue of ceramic enterprises has significantly increased, and with the increase of potential revenue, the sales revenue of enterprises has increased more significantly

References

1. Wu Yunxian, Zhou Wang Xin'an.Constructing institutional mechanisms for high-quality economic development through digital economy [J/OL]. Reform and Strategy, 1-12 [June 19, 2025] http://kns.cnki.net/kcms/detail/45.1006.C.20250619.0955.008.html.
2. Li Shui Qiu Artificial intelligence drives the transformation of the digital economy industry structure: mechanisms, practical challenges, and optimization paths [J/OL]. Reform and Strategy, 1-4 [June 19, 2025] http://kns.cnki.net/kcms/detail/45.1006.C.20250619.0945.006.html.
3. Du Xiangyin Exploration of the Path for County level Integrated Media to Assist Local Economic Development: Taking the Integrated Media Center in Qianshan City as an Example [J]. News World, 2025, (05):16-18.DOI:10.19497/j.cnki.1005-5932.2025.05.020.
4. Li Yihang, Zeng Xueyun The operational mechanism and practical strategies of promoting the development of digital economy through new spatial information infrastructure [J]. Digital Transformation, 2025, 2 (04): 23-29.
5. Qu Guannan, Jie Yuan, Wang Luyao, etc Enterprise Digital Innovation Capability: Connotation, Measurement, and Impact [J/OL]. Scientific Research, 1-18 [June 19, 2025] https://doi.org/10.16192/j.cnki.1003-2053.20250619.001.
6. Zhong Dixie, Lu Ying, Luo Qiuju From Ceramic Production Center to Cultural and Creative Tourism Destination: Contemporary Revival and Innovation of Jingdezhen Traditional Handicrafts from a Knowledge Perspective [J/OL] Journal of Tourism Studies: 1-23 [May 28, 2024] https://doi.org/10.19765/j.cnki. 1002-5006.2023.00.032.

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