

Research Article

The Role of Artificial Intelligence in Enhancing the Process of Disseminating and Innovating Urban Subway Culture

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Abstract

Background: With the development of artificial intelligence technology and the transformation of the city image to the global comprehensive factor system, new demands have emerged for the visual representation of urban subway culture. **Objective:** In the era of artificial intelligence, we should explore the innovative ideas of urban subway cultural communication and put forward feasible cultural communication strategies. **Methods** The new trend of artificial intelligence technology is studied, and the new direction of urban subway culture communication is explored in combination with the information receiving mode of subway passenger groups. Through analysis, induction and other methods, the expression strategy of urban subway culture communication intelligence is proposed. **Results:** The study finds artificial intelligence technology to analyze the three main aspects of artificial intelligence to promote the new mission of urban subway culture communication, artificial intelligence to promote the new form of urban subway culture communication, and artificial intelligence to promote the new measures of urban subway culture communication, so as to realize the function of urban subway culture construction and publicity and promotion, and provide new ideas for the innovative development of urban subway culture image. **Conclusion:** Under the premise of establishing the concept of artificial intelligence, the dissemination of urban subway culture should aim at continuously meeting the public's vision of more and higher subway travel needs, so as to realize the development and innovation of urban cultural economy.

Keywords

Artificial Intelligence, Urban Subway, Cultural Communication

1. Introduction

As an important public transportation mode, urban subway not only effectively alleviates urban traffic congestion, but also shoulders the mission of showing passengers the excellent culture of the city. China is currently in the critical stage of the 14th Five-Year Plan, during which urban rail transit construction is transitioning from quantitative growth to high-quality development. Culture rejuvenates the country, culture is strong and the nation is strong. Comprehensively

promoting the construction of urban subway culture is not only the core connotation of building a strong transportation country in the new era, but also a key link in promoting the strategy of building a strong cultural country. With the rapid development of information technology represented by artificial intelligence, the domestic urban subway is accelerating the leap from digitization, networking to intelligence, which has given birth to the new demand for the intelligent dis-

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semination of urban subway culture.

2. Research Overview

2.1. Artificial Intelligence

Artificial Intelligence (AI) is a technology that simulates and imitates human intelligence. It enables computers to perceive, understand, reason, and make decisions through machine learning, deep learning, natural language processing and other methods, so as to realize autonomous learning and intelligent application [1]. It is a new technological science that studies and develops intelligent theories and methods, technologies and application systems for simulating, extending and expanding human beings. Artificial intelligence is the product of the interdisciplinary integration of computer science, neuroscience, cognitive science, linguistics and other disciplines. The research in this field includes intelligent robots, language recognition, image recognition, natural language processing, etc.



Figure 1. Artificial intelligence technology.

Artificial intelligence technology makes information recommendation through social networks, so that people can obtain information more conveniently and accurately, reshape the channels and ways of communication between people, and then form new social relations [2]. The core features of artificial intelligence are perception ability, learning ability and natural language processing ability. It is mainly divided into three types: supervised learning, unsupervised learning and reinforcement learning. Supervised learning predicts through a large number of labeled data training models, such as image recognition. Unsupervised learning looks for patterns in unlabeled data and is suitable for tasks such as market segmentation, as shown in Figure 1. Reinforcement learning achieves goals through interactive learning with the environment, such as a decision-making system for autonomous vehicles. In

addition, artificial intelligence can also be divided into weak artificial intelligence and strong artificial intelligence according to the strength of ability. Weak artificial intelligence focuses on performing specific tasks, such as intelligent assistants and recommendation systems. Strong artificial intelligence, with real cognitive ability similar to human beings, can understand, learn and apply knowledge, and perform complex tasks [3].

Artificial intelligence has penetrated into various fields of society, economy and culture, promoting industrial upgrading and reshaping human lifestyle through automation, intelligence and data analysis capabilities.

2.2. Urban Subway Culture

As an important part of urban culture, subway culture integrates spiritual culture, material culture and other aspects. It is not formed spontaneously, but a popular cultural phenomenon that is attached to the urban traffic system. It is the product of the integration and common development of urban economy, culture and other dimensions [4]. Culture is the root of spirit for a country, and the soul of vitality for a city. The urban subway culture can not only reflect the characteristics of urban culture, but also make the characteristics of urban regional culture more distinct and enhance the level and grade of urban culture through continuous refining and processing. Nowadays, urban subway is not only an important means of transportation for travel, but also a new carrier reflecting the regional culture of the city, as shown in Figure 2.



Figure 2. Urban subway traffic.

The subway not only provides a fast means of transportation for the city, but also creates a mobile urban culture display platform for modern cities. Subway culture is a kind of urban public culture created and gradually formed by subway participants with subway as the carrier. It has formed a subway culture with specific connotation through the urban subway architectural style, subway train appearance, cultural identity, subway employee behavior norms and so on. At the same time, subway culture is also the carrier of spreading

regional history and culture, a new business card to show the image of the city and a new way to spread Chinese voice. It plays an important role in cultural communication and injects new forms into regional cultural communication [5].

Regional culture provides the direction for the development of subway culture, and the construction of subway culture relies on regional culture [6]. Subway culture not only reflects the history and current situation of the city, but also indicates the future direction of urban development. Through the organic combination of architecture, art, technology and service, subway culture provides passengers with a comfortable, convenient and cultural travel experience. With the development of modern artificial intelligence technology, subway culture will continue to innovate and inject more charm of the times into urban life.

3. The Relationship Between Artificial Intelligence and Urban Subway Culture Communication

3.1. Artificial Intelligence Empowers Urban Subway Culture Communication and Service Quality

The first is to innovate the way of communication. Artificial intelligence technology has strong interactivity, diversity and integration [7]. The use of artificial intelligence technology to improve the quality of passenger services, such as the active service of special passengers and the accurate identification of abnormal behavior of passengers, makes the dissemination of subway culture more intelligent and personalized. Second, upgrade the service experience. Artificial intelligence can realize the functions of intelligent customer service and intelligent train inspection system, provide more convenient and comfortable travel experience for subway passengers, and also provide a better carrier for the spread of subway culture. The third is to strengthen security. Through intelligent image recognition technology, the subway department can detect abnormal behaviors and safety hazards of passengers in time, ensure the safety of rail transit, and provide a strong guarantee for the spread of urban subway culture.

3.2. Urban Subway Culture Provides Application Scenarios and Innovation Needs for Artificial Intelligence

First, enrich the application scenarios. The subway cultural theme stations, art installations, etc. provide rich application scenarios for artificial intelligence technology. Second, drive technological innovation. In interaction design, interaction experience can be improved by designing situations, implementing interaction programs, and using data [8]. The demand for immersive experience and interactivity in the dissemination

of subway culture has promoted the innovation of artificial intelligence technology in the fields of image recognition and natural language processing. Thirdly, promote industrial integration. The combination of subway culture and artificial intelligence technology has promoted cross-border cooperation in rail transit, culture, science and technology. Promote the integration and development of smart urban rail and artificial intelligence industry, and inject new vitality into the spread of subway culture.

4. Artificial Intelligence Promotes the Dissemination and Innovation of Urban Subway Culture

4.1. Artificial Intelligence Gives Birth to a New Mission of Urban Subway Culture Communication

To promote the innovation of urban subway culture communication, we must adhere to the spirit of culture. Through the use of digital technology, virtual reality technology and other scientific and technological means, we can fully show the characteristics of the city's history, culture and art, so as to improve the service level of urban subway culture communication and promote the new height of urban culture.

One is to improve the efficiency of urban subway culture communication. The subway audience is the recipient of cultural communication, and its characteristics, structure and psychological state directly affect the effectiveness of cultural communication [9]. By using artificial intelligence technology, the subway system can monitor and analyze the behavior patterns and preferences of subway passengers in real time, automatically screen cultural information related to passengers' interests, and more accurately push urban cultural content that meets passengers' interests, thereby improving the pertinence and efficiency of urban cultural communication. The second is to enrich the content of urban subway culture communication. Artificial intelligence can assist in the creation and dissemination of diverse subway cultural content, such as generating creative graphics and beautiful music through machine learning, adding more artistic elements to the subway space. The cultural and educational exhibition area is set up in the subway station to show passengers the unique historical, cultural and artistic achievements of urban development. The cultural exhibition area can make subway passengers feel the charm of urban culture in a relaxed and pleasant atmosphere through intelligent games, interactive Q & A and other forms. The third is to optimize the urban subway cultural communication channels. Digital technology represented by artificial intelligence is changing the global media landscape, impacting traditional information dissemination models and eliminating the inherent boundaries of the media industry [10]. Artificial intelligence technology pro-

motes the diversification and intelligence of subway cultural communication channels. For example, through smart screens and speech recognition systems, subway passengers can obtain and share urban cultural information anytime and anywhere. Fourth, expand the main body of urban subway culture communication. In the construction of urban subway culture, government departments, large enterprises and urban residents play an important role. The government departments should clarify the objectives and guidance to ensure the harmony and unity of the subway culture construction and the overall urban planning. Large enterprises provide a solid guarantee for the construction and operation of subway cultural projects through capital investment and digital technology support; urban residents actively participate in subway cultural activities and provide valuable feedback for subway cultural construction. The subway management department needs to strengthen the interaction and communication with the main bodies in different fields, improve their participation, and make the spread of urban subway culture more deeply rooted in the hearts of the people. The fifth is to promote the international dissemination of urban subway culture. As an important part of urban culture, subway culture integrates spiritual culture, material culture and other aspects [11]. With the help of artificial intelligence translation and natural language processing technology, the urban subway management department can accurately identify the behavioral characteristics and needs of foreign passengers, and help foreign passengers with different cultural backgrounds to understand the urban subway culture without obstacles, so as to provide more refined and personalized services for the international dissemination of urban culture.

4.2. Artificial Intelligence Has Given Birth to a New Form of Urban Subway Culture Communication

To promote the innovation of urban subway culture communication, we must adhere to the culture. In the process of artificial intelligence promoting the high-quality development of urban subway, we will show our cultural responsibility, enhance the strategic layout of urban subway culture, and vigorously develop a new model of urban subway culture communication.

First, the dissemination of urban subway culture is precise. In the process of urban subway culture dissemination, artificial intelligence technology can effectively improve data collection and processing capabilities. Through scientific analysis of subway passenger behavior patterns and cultural psychology, targeted promotion of urban cultural content that meets the preferences of subway passengers can achieve personalized and accurate recommendation purposes. In the era of artificial intelligence technology, the classic stories, folk culture and other essential contents in the urban cultural system can be accurately pushed, so as to broaden the communication channels of the excellent traditional culture of the

city and promote the dissemination and promotion of the excellent culture of the urban subway. The second is the liveness of urban subway culture communication. Artificial intelligence technology is to serve the people, all the final decision should be people-centered [12]. In terms of transmission channels and methods, artificial intelligence is vigorously promoting the process of activating the excellent culture of urban subway. In order to achieve the purpose of cultural output, we can use different media to broaden the channels of communication, use the new mode of communication to innovate the mode of communication, and connect the subway as a medium with the local culture [13]. At present, relying on the generative artificial intelligence technology such as large language model and visual diffusion model, the carriers such as language, visual effect and music arrangement can be created by AI, which makes the heavy urban history and culture vivid and realistic, makes the subway culture more closely related to the real life, and also brings better service experience to the subway passengers. Taking the first subway digital art museum in Hunan Changsha subway Yingwanzhen station as an example, the museum transforms the original subway commuting space into an artistic space full of light and shadow texture, and highly restores Changsha's historical blocks, urban nodes and other interesting architectural scenes through pixel illustrations. It comprehensively and stereoscopically expresses the urban style and cultural heritage of Changsha, which is of great value to promote the innovative development of urban culture, as shown in Figure 3 and Figure 4.

The third is the iterative dissemination of urban subway culture. Content construction is a solid foundation for the dissemination of urban subway culture. First of all, through artificial intelligence technology to strengthen content construction, stimulate subway passengers' strong interest in cultural content, and promote passengers to participate more deeply in urban cultural narrative, so as to effectively promote the spread of urban subway culture. Secondly, through the optimization of artificial intelligence technology algorithm, more professional content output and push are realized, which helps the urban subway excellent culture update iteration. For example, the breakthrough of artificial intelligence in emotional speech synthesis technology can identify and analyze the emotional state of passengers, simulate the speed, tone and sense of speech of real people, and better complete the task of spreading subway culture. Fourth, the diversification of urban subway culture communication. Artificial intelligence technology enriches the application scenarios of urban cultural resources through cross-border integration, and realizes the push and dissemination of subway culture on multiple platforms. In the process of urban subway culture communication, we actively seek cooperation with other industries to expand the channels of urban cultural content communication. For example, artificial intelligence is combined with urban cultural resources to identify and integrate dialects across the country and classify them into urban subway cultural scenes

to meet passengers' different cultural needs for artificial intelligence application scenarios.

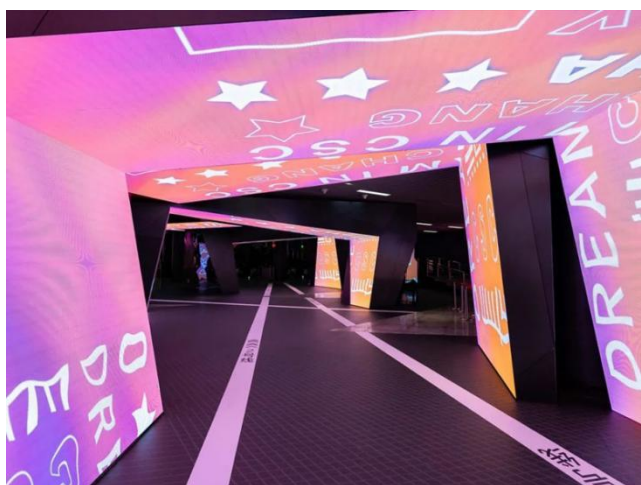


Figure 3. Hunan Changsha Metro Digital Art Museum.



Figure 4. Hunan Changsha Metro Digital Art Museum.

4.3. Artificial Intelligence Has Spawned New Measures for the Dissemination of Urban Subway Culture

The "Guiding Opinions on Strengthening the Construction of Cultural Industry Organizations" issued by the General Office of the Central Committee of the Communist Party of China emphasizes the promotion of cultural industry organizations to expand their coverage and enhance their service capabilities. Encourage powerful industry organizations to enrich service models, make full use of mobile Internet platforms and channels, and expand social influence. To promote the innovation of urban subway culture communication, we must adhere to the principle of benefiting the people with culture and accelerate the intelligent construction of urban subway culture.

The first is to formulate the top-level intelligent communication norms of urban subway culture. Incorporate urban

cultural elements into the evaluation standard system of urban subway cultural intelligent communication, increase the investment in the construction of urban subway public cultural space, and mobilize the enthusiasm of government departments, large enterprises and urban residents to participate in the construction of urban subway culture. The second is to create a city subway cultural business card with obvious characteristics. To excavate the cultural heritage of local cities, to create subway cultural projects with rich connotation value and distinctive characteristics, to carry out national cultural activities in an all-round way, and to inject new vitality into urban subway culture. Accelerate the all-round cultural construction of urban subway from the ground space to the underground space, and strive to create a new brand of urban culture with significant differences. For example, the Nanning city subway and the cultural sector work closely together, running through the Zhuang's 'bronze drum' element on the city subway line 2. The space decoration of the subway station takes 'bronze drum rhyme' as the design concept, deeply excavates and shows the Zhuang cultural elements, and highlights the unique charm of the local national culture, as shown in Figure 5 and Figure 6.

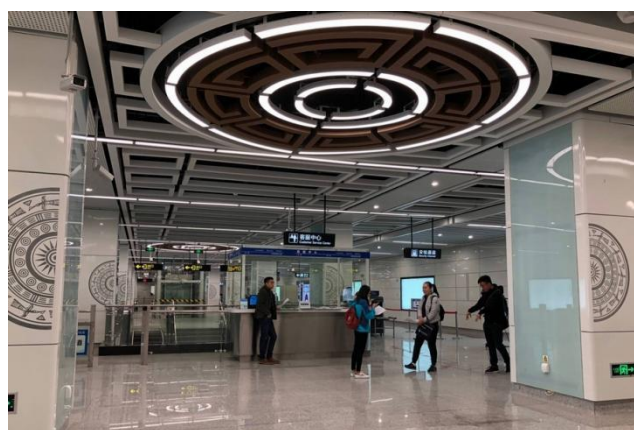


Figure 5. Nanning subway Zhuang culture.

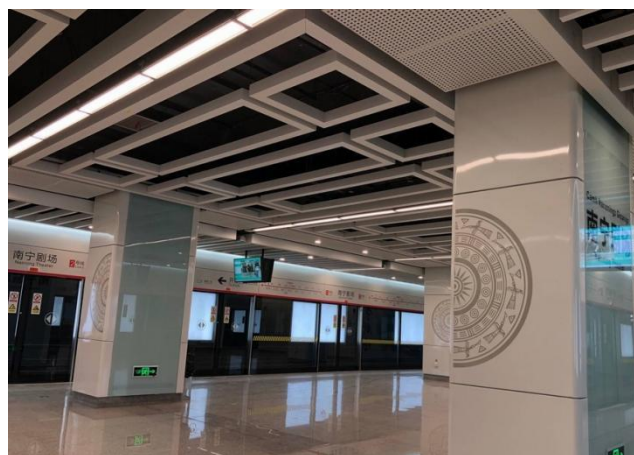


Figure 6. Nanning subway Zhuang culture.

The third is to build an intelligent communication platform with rich cultural connotation of urban subway. As an important means of transportation in modern cities, the subway closely connects various tourist attractions and provides convenient transportation for tourists [14]. It is necessary to adhere to the principles of distinctive characteristics, outstanding value and elegant aesthetics, give full play to the role of urban subway stations as a public cultural platform, and create a cultural highlight project with both urban tourism cultural taste, artistic aesthetics and social effects. For example, the art wall of Zhuyeshan Station of Wuhan Metro Line 8 takes 'the main axis of the Yangtze River' as the theme, and adopts the organ-style winding surface design to vividly show the morning light and night beauty of Wuhan Jiangcheng, as shown in Figure 7. Guangzhou Nansha Passenger Port Station adheres to the design concept of 'unique ocean', integrates art appreciation, historical elements and marine civilization, highlights the characteristics of Guangzhou Lingnan culture, see Figure 8; chengdu Metro Line 17 is based on the theme of "water nurtures willow city, silk brocade and embroidery", with water as the guide and ecology as the clue, wonderfully presenting the long history and culture of the ancient Shu State for three thousand years, as shown in Figure 9. As an important carrier in the subway space, the subway cultural wall can not only present cultural information, but also an important form of characterizing the image of the city [15].



Figure 7. Art Wall of Zhuyeshan Station of Wuhan Metro.



Figure 8. Guangzhou Nansha Passenger Port Subway Station.



Figure 9. Chengdu subway 'Shu' culture.

The fourth is to promote the cross-domain integration of urban subway culture communication. The central government issued the "Opinions on Accelerating the Development of Deep Media Integration", emphasizing that it is necessary to take advanced technology as the guide to drive the development of media integration, strengthen the forward-looking research and application of new technologies in the field of communication, and strive to create an all-media external communication pattern and spread Chinese culture. The subway department can actively cooperate with relevant institutions in the fields of art, culture, science and technology, promote the integration and innovation of urban subway culture and multiple media, and jointly plan and organize urban subway culture communication activities. At the same time, we should make full use of artificial intelligence technology to realize the cross-platform dissemination and interactive experience of subway cultural content, and inject new vitality into the dissemination and development of subway culture.

5. Conclusion

In the era of artificial intelligence, we should explore an effective mechanism for the integration of culture and science and technology, realize the digital empowerment and information transformation of cultural construction, and transform the advantages of cultural resources into the advantages of cultural development. As a product of the development of urban subway, subway culture is an important part and new carrier of urban culture. Artificial intelligence technology promotes the integration of subway culture with urban culture in an innovative and progressive manner, so that urban culture is inherited and colorful.

Abbreviations

AI	Artificial Intelligence
Q&A	Questions and Answers

Author Contributions

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The data that support the findings is available from the corresponding author upon reasonable request.

Conflicts of Interest

The author declares no conflicts of interest.

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