

Application Research of Artificial Intelligence Technology in Enhancing the Quality of Cultural Tourism Experiences

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Abstract: *Given the demands of the new era, people are starting to want more personalised and emotional culture. The Reasons for Improving People's Lives with Artificial Intelligence Technology will be presented in this paper. Build a whole system of cognition, emotion and behaviour to assess the quality of experience, and investigate the inner mechanism by which clusters of perceptual, cognitive and generative intelligent technologies enable the reconstruction of experiences. The three main technologies are intelligent information interaction, immersive environment creation and personalised services; in this paper, it is shown that artificial intelligence can improve the quality of experience in the following three ways: optimise processes and deepen cognition; enhance emotional resonance and meaning construction; and promote the long-term effect of experiences. It will provide some references for the research on the intelligent transformation of cultural tourism experiences.*

Keywords: *Artificial Intelligence, Cultural Tourism, Experience Quality, Intelligent Interaction, Immersive Environment, Personalised Service, Cognitive Depth, Emotional Resonance*

Introduction

The Structure of the Supply of Cultural Tourism Experiences is Changing Significantly Now. The old model of standardised information services and fixed displays can no longer meet the high demand tourists have for rich knowledge, emotional connection and personalised experiences. The new focus of the point on the quality of experience is now cognitive gains, emotional responses and the creation of personal meaning for tourists; thus, tourism services need to change from one-way dissemination to two-way interaction and from fixed programmes to dynamic creation. Therefore, the advantages of AI technology are that it can intelligently process data and understand context, create content, and it is hoped that in the future, people will experience culture and nature through AI. Most of the current research is a case description of a particular technological application; it does not integrate a theoretical discussion on the internal mechanism of technological empowerment, the composition of systematic technological dimensions, etc., and is all based on the intrinsic dimensions of experience quality. Therefore, this paper has some theoretical contributions. To solve the problems in the above research, the three parts of the framework will be the "theoretical basis", "technical features" and "promotion effects". Based on the above framework, this paper will investigate how and to what extent artificial intelligence technology can improve the general quality of the cultural tourism service system, provide strong theoretical support, and offer an intelligent development path for the cultural tourism industry.

1. Theoretical Foundation of Artificial Intelligence and Cultural Tourism Experience Quality

1.1 General Size and Evaluation Indices of Cultural Tourism Experience Quality

In short, the quality of the cultural tourism experience is determined by all sorts of factors and refers to the emotions and meanings that tourists take away from participating in cultural tourism activities. Cognition is the amount of knowledge tourists have gained about the cultural symbols, history and local wisdom of a place through their own experiences. The emotions people feel during a tour are their own emotions, such as empathy, immersion and aesthetic pleasure. Behaviour is a person's will and way of acting during participation in or experience of an activity. All the above indices are combined to make up the total tourism quality index.

To obtain all the details of this quality, we need to build a system that considers both emotions and facts. Subjective evaluation criteria are the psychological benefits and satisfaction tourists feel themselves, and they are generally obtained through self-assessment. At the same time, objective evaluation norms are the technical indicators of how smooth the process of experience is, how accurate the transmission of information is, and how responsive the links for interaction are. The purpose of building this index and how changes in the external technological environment will affect tourists' internal psychological states will be introduced; at the same time, a good index for in-depth study in the field of applied technology will also be provided ^[1].

1.2 Analysis of the Artificial Intelligence Technology System and Its Adaptive Functions

The three main technology clusters of the artificial intelligence technology system in the field of cultural tourism are perception intelligence, cognition intelligence and generation intelligence. Perceptual intelligence can quickly sense and understand changes in the real world, as well as tourists' behaviour and other unstructured information, through computer vision, natural language processing, the Internet of Things, etc. Cognitive intelligence will use machine learning and knowledge graphs to process data, find trends, make personalised decisions, build an ever-changing knowledge base of cultural resources and tourist demands, etc. Generative intelligence is the creation of new interactive materials and experience areas that can be generated naturally through language and contain various contents.

The system has many good points and can be applied to the purpose of cultural tourism. It is data-driven, so we can collect a large amount of all kinds of cultural tourism data and obtain timely results; thus, we do not need to rely on the old way of interpreting static, one-sided information. Technology has good interactivity and scalability; therefore, it can be updated according to changes in the times and customised. The whole chain of perception and understanding ability can be used to create new forms of interaction between tourists and cultural heritage, and the mode of experience design can be changed from fixed and standardised to dynamic, conversational and ever-changing.

1.3 Analysis of the Intrinsic Mechanism of Technology for Improving the Quality of Experience

The first goal of using artificial intelligence to improve the quality of life of the people is not to change the traditional way of life, but to create a new type of life. First, we need to change how tourists learn about and experience the culture of a place in the information age. Technology can be employed to obtain relevant information accurately and present it in various forms according to what tourists already know and are interested in at that time, thus reducing their mental stress and enhancing the quality and order of learning. Therefore, it will be convenient to gain all-round knowledge and move from simple observation to actual learning ^[2].

First, with the changes in society due to technology, people's emotions have also changed. Build a fictional world or an intelligent interactive character based on real life in virtual reality to help people experience emotions through artificial intelligence in a new way. Tourists are no longer the receivers of the service; they are now active participants. Technology can make people feel all sorts of emotions by providing personalised conversations, contextualised stories, prompt responses to changes in their environment, etc., and thus can arouse their interest, curiosity and imagination. Therefore, the above steps can help close the loop of meaning construction and achieve the goal of creating personal significance through emotional participation in learning new knowledge. Therefore, it can be concluded that the main way for technology to improve the quality of tourists' experience is to modify their cognitive-emotional cycle.

2. Key Technological Features of Artificial Intelligence in Cultural Tourism

2.1 Intelligent Information Interaction and Deep Content Interpretation Technology

At the foundation of intelligent information interaction technology is the restructuring of the interface between tourists and cultural information, and its construction is based on the mature application of natural language processing and dialogue systems. Semantics and context recognition can be used to understand the difficult or ambiguous questions tourists have asked in natural language, and then appropriate, correct and informative multi-turn answers will be provided. Audio guides and fixed-menu questions are no longer the sole means; now, intelligent question-and-answer and guidance

services can be employed to meet people's different needs in real time and provide more convenient and natural access to information. All kinds of information, such as sound, motion and even eye movements, are being collected bit by bit through such interactions to obtain more complete data on people's behaviour and interests and promote the development of "context-aware" technology.

Deep content interpretation technology will help us find and present all sorts of meanings in the cultural heritage. Generally speaking, computer vision technology is used to recognize the shapes and features of artifacts; Natural Language Processing is employed to understand historical documents and records; and large-scale knowledge graphs are used for association reasoning. Collect and analyse the spread of data from all sides to automatically generate rich explanatory materials based on facts, and this information will also include details of network connections and historical development. It can help the tourists organise the system of information they have learned, place individual objects of interest in a larger context of culture, art and history, and thus achieve a higher level of understanding. The new frontier of technology is that generative models can dynamically create all kinds of comparative and speculative interpretation texts according to changes in tourists' cognitive backgrounds to promote critical thinking and move away from the old model of one-way knowledge transmission towards heuristic cognitive dialogue [3].

2.2 Generation and Construction Technologies for Immersive Experience Environments

The construction of Immersive Experience Environments is based on the combination of Extended Reality Technology and 3D Generation Algorithms. Extended Reality (XR) is a type of mixed reality that combines or integrates digital content with the real world, so it is possible to show the original appearance, development process and related story scenes of static historical sites and exhibits dynamically. As there is no archaeological data or historical records, 3D generation algorithms can reconstruct damaged or lost buildings, artifacts and historical scenes to give tourists an experience of life in different periods and places. All of the above will expand the scope and consciousness of the experience.

In creating such environments, we should be conscious of the sense of place and the stories or emotions we hope to convey to the people. With the help of spatial computing and real-time rendering technology, different stories, events and environments can be changed dynamically according to where the tourists are, what they are looking at and doing. Responsive Web Design will create an intelligent storytelling environment that people can experience and feel, and at the same time, tourists can create their own stories and be a part of them. The purpose of this technology is to create a very realistic, lively and personalised world of stories that can attract all kinds of people's interest.

2.3 Personalised Service Generation Technology Based on Tourist Profiling

A dynamic and comprehensive model of tourist data will be built to meet all the different needs of tourists. Collect and analyse the explicit behaviour data of tourists (such as their visit path, length of stay and interaction logs), add some demographic attributes and potential preference information (such as content clicks, semantic searches and social sharing behaviour), and continuously learn and update the interest graph, cognitive level and experience patterns of individual tourists. The data-driven model above will not limit the division of groups and will also help us learn how different tourists learn and what interests them in culture [4].

Dynamic profiling will be employed to offer personalised services in real time, and then algorithms will filter the content, organise the routes and recommend activities. Given the current situation and demands of tourists in modern society, this system will be able to provide all kinds of personalised recommendations for tourist attractions, content, activities and other interests based on a large database of cultural resources and pre-planned experience packages. It does not need to be in accordance with the information; rather, one should arrange the sequence of experience elements intelligently and regulate the rhythm of cognitive load and the curve of emotional response. The purpose is to better meet the actual demands of the people, offer all-round, continuous and exclusive service experiences, and thus help tourists gain more knowledge and happiness.

3. Pathways and Impacts of Artificial Intelligence on the Quality of Cultural Tourism Experience

3.1 Enhancement of Experience Process Fluency and Cognitive Depth

AI will help people travel better and make more informed choices in their daily lives and online. Intelligent Guidance Systems know where people are and how they move, so they can plan different routes, avoid traffic jams and reduce travel time. The interface for natural language interaction does not need to be formatted or organised; it is simple to get the information. Smoothing out the process of experience can reduce the number of problems tourists have to solve themselves, allow them to focus more on enjoying the observation and learning activities, and thus make the overall experience smoother and more pleasant ^[5].

Reduce the cognitive load and gradually increase the depth of cognition by organising knowledge and associative content. Machine learning can know how well a person has understood something in real time, and based on this, provide more difficult supplementary materials or leading questions to motivate them to learn. Knowledge graph technology can connect all the cultural knowledge in a network and offer many different contexts for interpreting the same object, such as its historical origin, artistic features, social functions, etc. At the first point of contact for tourists, a cognitive framework can be established to help them organise their knowledge of the culture in an organised, reasonable and critical manner. Therefore, technology can be used to improve the external optimisation and internal cognitive support of traditional sightseeing, create an efficient and intellectually stimulating learning experience for tourists, and this will be reflected in the expansion and restructuring of tourists' knowledge systems.

3.2 Enhance the Emotional Resonance and Meaning of Experiential Content

The origin of the reason for emotional resonance is the incarnation and narrative world built by technology. Tourist areas that can stimulate people's five senses often evoke emotions by showing historical scenes, changes over time, symbolic pictures and metaphors, etc. Intelligent narrative agents can change the speed and emotional tone of the story based on interactions, have tourists participate in the story, and thus increase their sense of identification and emotional investment. Now, technology is used to create such environments and directly evoke emotions in people's minds without the need for words or sound ^[6].

More construction of meaning can be achieved by using technology to personalise the interpretation and creation of connections. Personalised service generation systems can recommend content that is in line with the existing knowledge base and values of tourists according to their profiles to meet some of the demand for personalised meaning. Interactive technology can be used to have tourists add their own notes to the cultural materials, collect all kinds of information, create new stories, and actively explore and learn about the cultural connotations they have gained through experience. Artificial intelligence can serve as a "catalyst" and "scaffold" to support and promote the construction process of helping tourists connect external cultural information with their inner world, reflect on it, form personal understandings, and obtain all kinds of materials, all sorts of views, flexible interaction platforms, etc. Technology can help us express our emotions more clearly, and more importantly, it can also direct the force of emotion in the creation of profound meaning. One can create one's own memories and a sense of values that are deeply felt and more personal.

3.3 Optimisation of Post-experience Satisfaction and Lasting Effect

Most of the satisfaction people feel at the end of an activity is due to the fact that their needs have been met by the environment. Based on the profiles of the tourists, personalised generation technology will be employed to customise the content, routes and services offered for different groups of tourists according to their specific needs and enhance their satisfaction with the value of the trip. A gentle process and deep thought have brought me some happiness, and I am satisfied with the results of this activity. Artificial intelligence will continue to learn about people through observation and analysis, make corresponding adjustments based on this information, offer personalised services at any time, and thus increase the sense of satisfaction for people in their daily lives.

To improve the long-term retention of knowledge, we will advance the development of memory-consolidation technology and extend sharing and reflection. Personalised digital souvenirs, such as custom digital storybooks or visual reports of one's own trip, can make the memories of the

experience more concrete and attractive, so they are easier to save and remember in the future. Lightly reflective questions or related content that intelligent systems generate based on tourists' behaviour data can leave a lasting impression on people's minds long after they have left the tourist attraction and extend the psychological effect of the experience. The technological additions mentioned above can increase both the length and the amount of a single cultural tourism experience, embed it in tourists' long-term knowledge system and network of meanings, and thus have a lasting impact. Post-experience optimisation is a change in one's attitude and behaviour after having experienced something that brings fleeting joy; it is a wish to feel that joy again, an increase in interest in culture, and prolonged identification with certain cultural values, so the quality of the experience has been extended from an immediate feeling to a long-term cycle in life.

Conclusion

Based on the construction and analysis of the theory in this paper, it has been determined that artificial intelligence technology can improve the quality of cultural tourism for all people by providing support at all levels, such as cognitive restructuring, emotional stimulation and sense-making assistance. Technology is not only a tool but has also changed how people obtain information, perceive the world and learn about everything in the process of perception, cognition and creation. The three main ways are as follows: First, technology can enhance the fluency of the experience through intelligent interaction and environmental computing; second, cognition at the level of knowledge graphs and associative interpretation can be strengthened. Second, create an attractive world and give people their own stories so that they are more willing to feel and express emotions. Thirdly, as people's backgrounds and experiences are all different, personalised generation can be used to meet the needs of all kinds of groups of people and extend the life of their memories. The following two research directions will be chosen in the future. First, we will study how to apply explainable artificial intelligence and transparent algorithms in cultural interpretation to combine technological intelligence with the cognitive autonomy of tourists. Second, with the addition of new technologies such as cross-modal affective computing and brain-computer interfaces, we will be able to obtain more precise and rich information on people's emotions and experiences at the neuroaesthetic level in cultural tourism, thus promoting the development of a more intelligent, humane and ethical smart cultural tourism ecosystem.

Fund Projects

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