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Research on the Application of Chinese GPT based Generative Artificial Intelligence AI in Tourist Consumption

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Abstract: Information technology has brought dramatic breakthrough to the tourism industry. The pre-trained generative transformer AI mata model utilizes intelligent technology to optimize tourism information search, which is the key to travel planning. Although its progress brings surprising experiences, there is still a gap between user expectations and experiences. This project focuses on the Chinese market and examines the experience of tourists using relevant AI models in tourism route planning. It provides reference for enterprises to improve models and optimize services based on AI models, and also provides guidance for tourists to choose and improve the effectiveness of model use.

Keywords: Generative AI models; China; Travel route planning.

1. Introduction

The leap of electronic information technology has constantly challenged the traditional tourism supply model and accelerated the intelligent transformation of the tourism industry. In this context, AI mata models, especially generative artificial intelligence, have achieved breakthroughs in fields such as text and images with their independent content generation capabilities, and have been widely applied in many industries. At present, there are only two mata models in the market that specifically provide services in the tourism field: Ctrip Quest and Apple's ask Layla. Other mata models that include information services in the tourism field include Zhipu Qingyan, Tiktok Doubao, ERNIE Bot, Tencent Yuanbao, Tongyi Qianwen, iFLYTEK Spark, etc. The AI mata model utilizes intelligent technology to optimize tourism information search, which is the key to travel planning. Although its progress brings exciting experiences, there is still a gap between user expectations and experiences. The research and promotion of tourism AI models is an important driving force for the transformation and intelligence of the tourism industry. Exploring its perceived usefulness and ease of use can not only optimize the model and improve user satisfaction, but also guide tourism enterprises to accurately position market demand, adjust strategies, strengthen services, and ultimately achieve a comprehensive upgrade of user experience. This project focuses on the Chinese market and examines the experience of tourists using relevant AI models in tourism route planning. It provides guidance for both enterprises and consumers to improve the situation they face presently.

2. Literature Review

On November 30, 2022, ChatGPT, a chatbot program developed by Open AI, was officially released. The investment in AI mata models is considered a significant disruptive innovation that will have a significant impact on multiple fields and bring about significant changes in the operation of industries and society, including the tourism and hotel industries (Gursoy et al., 2023; Aydin & Karaarslan, 2023; Kasneci et al, 2023).The research on generative artificial intelligence technology in China mainly focuses on the research of generative artificial intelligence in education, medicine, media and other fields (Tian Ye et al., 2024; Chu Xiaoyan et al., 2024; He Yangyang, 2024; Luo Yao et al., 2024; Wang Shuo et al., 2024; Wang Zhixiong, 2024; Li Mengyao, 2024; Li Junling et al., 2023). However, there is still a gap in the overall functional role of generative artificial intelligence and expectations of enterprises and consumers.

3. Research Method

This research uses the experimental method. The researcher designed 10 questions about tourism plan formulation to test eight models, including Ctrip Quest, Zhipu Qingyan, Tiktok Doubao, ERNIE Bot, Tencent Yuanbao, Tongyi Qianwen, iFLYTEK Spark and Apple ask Layla. Then, based on the actual usage experience and opinions of each participant, key factors that affect user satisfaction are summarized and extracted, covering information authenticity, content richness, answer optimization, question optimization, multimodal questioning, previous comparison, accessibility, and other aspects of the meta language model. Each participant's rating for each aspect is recorded, ranging from 1 to 5 points, with 1 point being very dissatisfied and 5 points being very satisfied. After the experiment is completed, adjust and optimize the experimental steps and instructions based on the pre-experimental results.

4. Results and Discussion

Based on the TAM model, the experimental test results of the eight models will be analyzed from the perspectives of perceived usefulness and ease of use. Perceived usefulness is influenced by dimensions such as multimodal output, structural clarity, information authenticity, content richness, and output quality. Perceived usability is influenced by dimensions such as question optimization, accessibility, and comparison of contextual output. Below are detailed descriptions respectively.

4.1. Perceived Usefullness

Multimodal output refers to whether the output of a large model can be answered in various forms such as text, images, links, or videos. ERNIE Bot links Baidu map plug-in, and the scenic spots are clearly marked; Doubao is based on the rich data content of Tiktok, supporting short video and Tiktok encyclopedia output; Tencent Yuanbao can output images, Apple Ask Layla can output images and videos, and Ctrip supports services such as map and travel product booking, with the most diverse output forms; After testing, most of the popular tourism AI models in the current market support multimodal output, with vivid forms, which is conducive to promoting the realization of one-stop tourism services.

Structural clarity refers to the clarity and readability of the overall structure of the model after generating answers, with emphasis on key points. In the test process, except for the phenomenon that some of the questions answered by Tiktok Doubao are not layered in structure and play is not stable enough, which affects the readability, the rest of the travel AI model answers can be itemized, clear, easy for users to understand, and highly readable.

Information authenticity refers to whether the relevant information provided by the large model is accurate, reliable, and updated in a timely manner. The ratings of the eight AI models in this study are all 4 or 5, indicating that the mainstream AI models in the current tourism market can provide tourists with relatively real and reliable relevant tourism information.

The content richness dimension refers to whether the relevant content provided by the large model is diverse, multidimensional, and multimodal. There are certain differences in the ratings of content richness among the eight AI models studied in this study, indicating that the mainstream AI models in the current tourism market have gaps in the level of detail and diversity in providing corresponding information. Among them, Apple's ask Layla mainly targets the overseas market and has limited functionality for the mainland region, providing relatively concise travel information. At the same time, the number of travel plans is limited, and it is given a score of 2. However, iFlytek Spark often only provides one solution, with a score of 3. ERNIE Bot, Zhipu Qingyan, Tongyi Qianwen, Tencent Yuanbao and Ctrip Wenwen can effectively solve tourists' problems, but they do not perform well when there are too many factors to ask questions, scoring 4. Finally, Tiktok is more excellent, scoring 5.

Answer optimization refers to the process of supplementing and improving answers when a large model is repeatedly asked questions. The table results show that all eight AI models in this study were able to supplement and optimize the given answers after receiving repeated questions, but the degree of optimization varied. Due to limited domestic data samples, the response given by Apple's ask Layla did not show significant changes and was given a score of 2. IFlytek Spark is limited by the limited information entered into the large model, often adding little new information when answering, and focusing more on optimizing the structure and organization of the answer. Therefore, it is assigned a score of 2. The four major models of ERNIE Bot, Zhipu Qingyan, Tongyi Qianwen and Tencent Yuanbao can expand the answer content and change the tourism plan to a certain extent after multiple questions. The optimization results are obvious, but considering the convergence in content, 3 points are given. Tiktok Doubao is based on a rich and diverse database of Tiktok users. It can not only expand the reply content after asking questions, but also provide many different solutions for questions. At the same time, the content of the tourism plan is also different from the modelized answers given by other mata models. It has distinctive personalized characteristics and excellent performance. It has 4 points, and Ctrip also has 4 points. Research shows that the mainstream AI models in the current tourism market have significant room for improvement in the field of answer optimization.

The quality of output (achieving the final expected degree) is ultimately influenced by a combination of factors such as questioning and information authenticity, content richness, and answer optimization of the large model. After experimenting on eight AI models, it is found that ERNIE Bot, Zhipu Qingyan, Tongyi Qianwen and Tencent Yuanbao are convenient to use, and can provide appropriate solutions according to user questions, providing effective help and suggestions for tourism decision-making. However, due to similar data sources, the content given is convergent, so it is graded as 4. While Tiktok Doubao is convenient to use, it can provide more personalized content and travel plans than other large models. However, it does not support multimodal questioning forms, so it is given a score of 4. As a professional AI travel guide, although Ctrip can provide the most detailed and feasible solutions, it is given a score of 4 due to its more complex usage compared to other large models. Apple's ask Layla is given a score of 2 due to its market not targeting the mainland region, inconvenience in use, and relatively lagging development. However, iFlytek Spark does not focus on the tourism industry, with limited database information and insufficient content provided. At the same time, the response is relatively fixed, with a score of 3. The different expected degrees of each major model can reflect that their output quality is also not the same. Overall, each major model currently has different shortcomings that affect the stability of output quality.

4.2. Perceived Ease of Use

Question optimization refers to the process in which developers provide technical conditions to refine and optimize questions that users input into the dialogue box before engaging in a conversation with an AI model, in order to facilitate better understanding and answering of different questions by the model. During the testing of several domestic AI models, only iFlytek Spark provided this technology, while other large models did not.

The previous comparison refers to the process in which users, due to certain reasons, are not satisfied with the results provided by the model and then ask a new question. The model will reanalyze and generate second or even third answers, and the user compares and selects based on several answers. Taking travel plans as an example, users may not be satisfied with the travel plan provided by the AI mata model for the first time. They will ask the mata model the same question multiple times, prompting the AI mata model to continuously adjust and optimize the plan, ultimately achieving the user's expectations. When testing the domestic AI mata model, ERNIE Bot, Tongyi Qianwen, iFLYTEK Spark and Tencent Yuanbao can all provide users with different answers for comparison, while Zhipu Qingyan and Ctrip Wenwen can't be regenerated, and Tiktok Doubao covers the previous text after generating new answers, which can't be compared. By comprehensively considering the three dimensions mentioned above, the convenience of using a

certain large model can be determined.

Accessibility refers to the accessibility of AI services or solutions during the process of user acquisition, use, and experience. According to the test results, due to the fact that Apple's ask layla is mainly targeted at overseas markets, many functions in China are not open and require a certain technical threshold to use, resulting in the lowest usability. Ctrip asked if there were some devices that could not be used during testing, which affected the accessibility rating. In addition, the use of other major language models involved in this study is very convenient and smooth, with excellent accessibility performance.

5. Suggestions

Enterprises should actively expand and deepen the functionality of tourism AI models. Developers can develop multiple plugins within the large model, while enhancing real-time coverage of information on niche, personalized travel destinations and unique tourism activities to meet the increasingly diverse travel needs of today's tourists.

Enterprises should actively seek value co creation with users. Enterprises can promote the value co creation between the mata model platform and users by enhancing the natural language processing capabilities of the mata model, adding question optimization and guidance tools, providing question templates to assist in dialogue, and other means, guiding the healthy development of tourism AI mata models.

Enterprises should face up to and make every effort to make up for the shortcomings of each major model. Based on the comprehensive survey results, the mainstream AI models in the tourism market currently have their own shortcomings. For example, the processing ability of some large models for complex problems needs to be improved, and how to improve the mechanization of large models to provide users with more emotional value. Developers should promptly improve the presentation of large models to better meet the needs of users.

Enterprises can actively shape their brand image, clarify their market positioning, and further enhance their brand customer segmentation work, thereby promoting the further development of large models while meeting the social or belief values of users. We hope that the industry will continue to develop and provide high-quality tourism services in the information age for Chinese and global tourists, and lead the world in this field.

Conflicts of Interest

The authors declare that there is no conflict of interest between and among the authors.

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