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Users' Perceptions Toward Applying Generative AI for Tour Itinerary Planning

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Abstract

Against the backdrop of tourism gradually becoming an indispensable part of people's lives, this study delves into the itinerary planning aspects of generative AI (GAI) tools, which rose to prominence since late 2022. This research work takes a qualitative approach; uses critical incident technique (CIT) as the research method for investigating users' perceptions toward applying generative AI tools for their itinerary planning tasks. The study reveals that the overall user perceptions are influenced by eight dimensions of generative AI applications: rationality, comprehensiveness, flexibility, personalization, precision, accuracy, timeliness, and efficiency. The research findings provide valuable advisory guidelines for those who try to optimize the user experience of GAI-enabled tour itinerary planning tools.

Keywords: generative AI, itinerary planning, critical incident technique

1. Introduction

In today's society, as people's living standards improve and their consumption awareness increases, tourism has gradually become an indispensable part of many individuals' daily lives. In past travel planning, travelers mainly relied on three methods for itinerary planning: the first method involves manually searching and organizing information on social media and other sharable platforms, which is time-consuming and labor-intensive. The second method is choosing fixed itineraries provided by tour groups, which is convenient but lacks personalization and flexibility. The last method is opting for high-cost personalized customization services, which can meet unique needs but comes with high expenses. With the growing prevalence of artificial intelligence technology, generative AI (GAI) tools can meticulously design tailor-made travel itineraries based on users' requests. This not only significantly saves travelers' time but also fully meets the unique needs of different groups. ChatGPT, Gemini, Copilot, Deepseek, and others are highly acclaimed GAI tools in recent years, and have been widely adopted by many travelers for planning their trips.

Even with GAI tools, travelers people still face hurdles making them often encounter difficulties such as being overwhelmed by large volume of information, struggling with personalization which usually is the key motive driving travelers to use GAI tools for itinerary planning, spending excessive time on planning due to long-winded interactions with GAI tools, lacking access to accurate and up-to-date details, etc.

This study aims to systematically examine the challenges travelers confront while they are using GAI tools to plan their trips through a wider lens. The research work uses CIT (Critical Incident Technique) as the research method, which collected and analyzed the key events from travelers who have ever used GAI tools for itinerary planning. The study delves into users' perceptions from 8 different facets, and provides concrete suggestions for improving GAI-enabled itinerary planning experiences accordingly.

2. Literature Review

2.1 The Current Situation and Development of Travel Planning

Current research and practices in travel planning have gradually shifted from single-task orientation to multi-task collaboration and intelligent integration. Huang et al. (2020) proposed a deep travel route planning framework for multi-task and multi-route scenarios, which can integrate travelers' preferences, historical routes, accommodation information, age groups, and other data points to generate customized travel plans. This framework significantly enhances the flexibility and personalization of planning. Complementing this framework is the rapidly developing generative artificial intelligence, further advancing the intelligence of travel planning. Generative AI can interact with travelers in real time through chatbots, gathering their needs and preferences to create precise travel itineraries tailored to them (Ilieva et al., 2024). This approach not only saves travelers time in collecting information but also allows them to obtain personalized travel plans without financial cost. Furthermore, with the rise of sustainable tourism concepts, the direction of travel planning is undergoing changes. Increasingly, travel bloggers are using social media to guide travelers

toward eco-friendly destinations and activities (Brdar, 2023), prompting travel planning to balance environmental responsibility with influencing user behavior. As a result, travelers incorporating sustainable tourism concepts into their plans while using generative AI tools can see these ideas reflected in their itineraries. Enhancing personal well-being is one of the main purposes of travel, and travel plans that align more closely with travelers' preferences can significantly boost their happiness (Filep & Laing, 2019). AI-generated travel plans influenced by sustainable tourism information not only contribute to the sustainable development of attractions but also enhance travelers' happiness in future travel planning.

2.2 Current Status of GAI Tools' Application on Itinerary Planning

The GAI tools based on large language model have multimodal comprehension capabilities, allowing it to collect and organize web information using its algorithm when users present multifaceted demands to fulfill their tasks (Hayder, 2025). This technology aligns perfectly with travelers' current needs for multitask and multi-route travel planning. Its multimodal comprehension capabilities optimize the multitask route planning framework, integrating travelers' preferences, historical routes, accommodation requirements, age groups, and travel purposes to generate personalized itineraries (Huang et al., 2020). Building on this, GAI tools language generation advantage supports travel bloggers in designing sustainable travel narratives (Koswara, 2025), enhancing the effectiveness of sustainable tourism advocacy through precise logic and emotional alignment (Brdar, 2023). Additionally, the model's open-source nature and low energy consumption, emphasized by Okaiyeto et al. (2025), enable tourism agencies in developing countries to use cost-effective travel planning tools while balancing efficiency and environmental responsibility. Using information technologies for travel planning not only supports a humanistic approach to tourism (Filep & Laing, 2019) but also achieves coordination between personalized services and sustainable development goals driven by AI, advancing the sustainable development of tourism.

A critical issue identified by prior research is the potential for inaccuracy or the generation of non-factual information, which can undermine user trust and lead to planning errors. Building user trust and ensuring transparency in how recommendations are formulated are crucial challenges. Research indicates that traveler confidence and willingness to adopt AI services are significantly impacted by concerns related to data privacy and the perceived opacity of AI algorithms (Bulchand-Gidumal et al., 2023). Furthermore, research touches upon usability challenges and the potential for information overload. While GAI aims to simplify information access, the interface design or the sheer volume of detailed outputs can still pose difficulties for users. The ability of AI to fully replicate human nuance or intuition in understanding complex travel needs is also a point of discussion, particularly when comparing AI chatbots to human travel agents (Jimenez-Barreto et al., 2021; Tosyali et al., 2025).

3. Research Methods

Prior research has primarily explored these issues from a single perspective. Building upon this, the current study attempts to comprehensively examine the challenges faced by travelers from multiple dimensions when they are using AI chatbots for trip planning.

3.1 CIT

Critical Incident Technique (CIT), introduced by American scholar Flanagan in 1954, is a qualitative research method that became widely used after the 1950s and has been commonly applied in various fields. CIT focuses on critical incidents and, by summarizing their commonalities, enables in-depth investigation to identify solutions.

The Critical Incident Technique (CIT), as a well-established qualitative research method, has demonstrated its academic value across various disciplines. In the field of business management, Janssens et al. (2023) utilized CIT, starting from interviews with Dutch suppliers, to investigate the dynamic impact mechanisms of safety controversies, technical disputes, and the implementation of performance contracts on supply chain relationships. In educational research, Wijaya and Kuswandono (2018) employed CIT to reveal that critical incidents can guide Indonesian English teachers in reflecting on their teaching practices, validating its effectiveness in promoting experience sharing and professional development. In healthcare, Rhéaume et al. (2022) used CIT to find that ICU nurses identified institutional preparation deficiencies, family trauma, and safety anxiety during the pandemic as the root causes of their moral dilemmas. In higher education, Staszkiewicz and Peszko (2024) applied CIT to confirm through interviews the core importance of academic teachers' psychological competence in responding to organizational crises. In management disciplines, Jais et al. combined behavioral event interviews to construct a five-level model of university leadership, while the Machaba team further demonstrated the dynamic collaborative efficiency of directive and adaptive leadership styles through 128 pandemic-related project management cases (2023).

3.2 Research Design

Considering that users often engage with GAI tools for travel planning on multiple occasions, it is essential to gain an in-depth understanding of their underlying experiences during usage. Therefore, this study employs the Critical Incident Technique (CIT), a qualitative research method, for its investigation. This research explores the factors that affect users' perceptions during the tour itinerary planning process using GAI tools by collecting both the most satisfactory and the most unsatisfactory critical incidents encountered by users (Flanagan, 1954). Based on these findings, a framework for GAI tools travel planning user experience is constructed, and a questionnaire is designed with reference to the method of Bitner et al. (1990). The questionnaire includes two major questions: (1) During your usage of GAI tools for tour itinerary planning (which should include precise details such as the number of days, budget, time, means of transportation, accommodation, participating groups, etc.), what was your most satisfactory experience or process? (2) During your usage of GAI tools for tour itinerary planning (which should include precise details such as the number of days, budget, time, means of transportation, accommodation, participating groups, etc.), what was your most unsatisfactory experience or process?

This study employed a fast and efficient online questionnaire to collect responses via an online platform over a period of 15 days, from March 11 to 25, 2025. During the questionnaire design phase, a question regarding whether respondents had used GAI tools

was specifically added to screen for suitable participants. Additionally, the questionnaire collected data on the most unsatisfactory critical incidents experienced by users when employing GAI tools for precise travel planning, thereby providing authentic and effective data support for subsequent research.。In summary, the CIT has been widely applied across various fields and has gained widespread recognition, fully demonstrating the maturity and reliability of this research method. Therefore, this study adopts the CIT method to deeply explore the factors influencing user experience while they are using GAI tools for itinerary planning.

4. Data Analysis

4.1 Basic Information

In this study, a total of 92 questionnaires were collected. After excluding 6 questionnaires that deviated from the topic or contained irrelevant responses, 86 valid questionnaires remained. These questionnaires reported 172 critical incidents for further data analysis, including 85 satisfactory incidents and 87 unsatisfactory incidents. Flanagan (1954) noted that while complex activities require the analysis of thousands of incidents, relatively simple activities only require the analysis of 50 to 100 incidents. The number of critical incidents used in this study was 168, which meets the requirements of the Critical Incident Technique. Table 1 clearly displays the composition of the respondents in this study.

Table 1. Basic Information of Respondents

Variable	Category	Participant Percentage
Gender	Male	38%
	Female	62%
Age	18 and below	7%
	19–24	16%
	25–30	21%
	31–40	27%
	41–55	17%
	55 and above	12%
Education Level	High school or below	5%
	College(Associate's)	28%
	Bachelor's degree	47%
	Graduate and above	20%
Income	≤ 2000 RMB	11%
	2001–3500 RMB	16%
	3501–5000 RMB	23%
	5001–8000 RMB	14%
	8001–12000 RMB	36%
	≥ 12001 RMB	17%
Employment Status	Student	33%
	Employed	45%
	Unemployed/Job Seeking	9%
	Retired	13%

4.2 Classification Principles

In this study, a total of 85 key incidents of satisfaction and 87 key incidents of dissatisfaction were collected. After an initial review and classification by researchers, the satisfied key incidents were categorized and named as reasonableness, flexibility, completeness, precision, personalization, and efficiency. The dissatisfied key incidents were categorized and named as reasonableness, flexibility, completeness, accuracy, timeliness, and homogeneity. Due to the presence of some shared characteristics between satisfied and dissatisfied key incidents, identical naming was applied. For detailed naming and descriptions of key incidents, please refer to Table 2.

Table 2. Key Incident Naming and Descriptions

Classification Naming	Detailed Descriptions
Reasonableness	It refers to the scientific approach to travel planning, including play routes, timing, pacing, and the rational allocation of activities and rest.
Flexibility	It refers to the flexibility in travel planning that allows users to make adjustments and adapt to unexpected changes.
Completeness	It refers to whether travel planning covers all necessary information (such as weather, attraction descriptions, crowd forecasts, etc.), ensuring the completeness of each link and avoiding the omission of critical details.
Precision	Refers to GAI tools' ability to capture user needs and match them accurately with actual requirements and resource conditions.
Efficiency	Refers to the speed at which GAI tools integrates information, formulates planning processes, and delivers complete plans.
Personalization	Refers to the targeting and differentiation of travel plans based on users' needs and preferences.
Accuracy	Refers to the authenticity of the data (e.g., crowd predictions, temperature, humidity) and information (e.g., ticket prices, cultural features) provided in the travel plans.
Timeliness	Refers to the speed at which information (e.g., crowd flow, traffic congestion, prices, activities) provided in travel plans is updated.

To ensure effective processing of the classified data in this study, three classifiers with extensive experience in the field of travel planning were invited to meticulously screen and categorize the collected critical incidents. To guarantee classification accuracy and research feasibility, there was a 30-day interval between the two rounds of classification. The first classifier is a tourism management instructor at a university, with eleven years of teaching experience in tourism management and a solid foundation in theoretical knowledge of tourism management. The second classifier is an independent travel planner who has been designing itineraries for travelers for many years and is well-versed in travel planning. The third classifier is a project manager at a tourism enterprise, possessing a wealth of industry experience in tourism planning.

4.3 Reliability and Validity Analysis

4.3.1 Reliability

Reliability analysis is a statistical method used to evaluate the consistency and stability of measurement tools or research methods. Within the framework of the Critical Incident Technique (CIT), reliability analysis focuses on the stability of the subjective judgments made by classifiers, including individual classifier consistency and inter-classifier consistency. Individual classifier consistency measures the classification results of the same classifier for identical critical incidents at the same time, while inter-classifier consistency tests the agreement among different classifiers when categorizing the same critical incident (Flanagan,

1954).Research indicates that in CIT, if the reliability analysis exceeds 0.8, the results of the study are considered acceptable (Butterfield et al., 2005). Information regarding the consistency of classifiers for satisfied critical incidents can be found in Table 3, while consistency information for dissatisfied critical incidents is presented in Table 4.

Table 3. Classifier Consistency—Satisfied Incidents

Classifier	Classifier1	Classifier2	Classifier3
Classifier1	80	-	-
Classifier2	63	73	-
Classifier3	70	61	75

Table 4. Classifier Consistency—Dissatisfied Incidents

Classifier	Classifier1	Classifier2	Classifier3
Classifier1	80	-	-
Classifier2	59	75	-
Classifier3	64	67	71

Based on the data in Tables 4 and 5, reliability analysis of the classifications made by the three classifiers is conducted. The formula is presented as follows:

$$A=\frac{\frac{2M_{12}}{n_1+n_2}+\frac{2M_{23}}{n_2+n_3}+\frac{2M_{13}}{n_1+n_3}}{N} \quad (1)$$

$$R=\frac{(N\times A)}{1+[(N-1)\times A]} \quad (2)$$

R represents reliability; A denotes the average level of inter-consistency; N refers to the number of classifiers; M indicates the number of identical samples classified between classifiers, for example: M_{12} represents the number of identical classification samples between Classifier 1 and Classifier 2; n represents the number of identical samples classified twice by each classifier, for example: n_1 represents the number of samples classified identically twice by Classifier 1.

After performing calculations based on the above formula, Table 5—Classifier Reliability Table—is obtained.

Table 5. Classifier Reliability Table

BBT Classification	Average Inter-Consistency (A)	Reliability (R)
Satisfied	0.850	0.944
Dissatisfied	0.814	0.929

From the table above, it can be observed that both the average inter-consistency and reliability exceed 0.8, indicating that the reliability test has been successfully passed. This ensures that the data can provide a reliable foundation for subsequent research analysis.

4.3.2 Validity

Validity evaluates whether a measurement tool accurately reflects the true attributes of the target construct, primarily including expert validity, content validity, and construct validity (Haynes et al., 1995). Expert validity refers to the systematic professional judgment of experts in relevant fields to ensure a high degree of alignment between the content of the measurement tool and the theoretical framework and practical needs of the target construct (Berk, 1990). In this study, experts in tourism planning were invited to classify critical incidents in CIT to ensure that the research direction aligns with the characteristics of tourism planning, meeting the standards of expert validity. Content validity refers to the extent to which the items in the measurement tool comprehensively and appropriately represent all relevant dimensions of the target construct (Lawshe, 1975). The CIT items in this study include travel days, budget, time, and transportation, covering relevant dimensions and meeting the standards of content validity. Construct validity refers to verifying whether the measurement tool aligns with its target construct through dynamic interaction between theoretical and empirical data (Cronbach & Meehl, 1995). In this study, data on critical incidents collected from travelers using GAI tools for travel planning were interacted with their impact on user experience, meeting the standards of construct validity.

4.4 Classification Results

To further investigate the specific impact of each classification on GAI tools' user experience, examples of satisfied and dissatisfied incidents were selected after categorizing and statistically analyzing the critical incidents. Examples of satisfied key incidents can be found in Table 6, while examples of dissatisfied key incidents are provided in Table 7.

Table 6. Examples of Key Satisfaction Events

Event Category	Example 1	Example 2
Reasonableness	Reasonably plans daily itineraries, e.g., visiting historical sites in the morning, dining at local specialty restaurants at noon, and heading to natural attractions in the afternoon, keeping the schedule tight and orderly.	GAI tools can organize daily activities effectively, maximizing time usage and avoiding overly tight or loose schedules.
Flexibility	When I had to change plans due to unexpected situations, it could easily add extra days, re-plan the itinerary, and rearrange accommodations.	f I found a day's schedule too tight, I simply told it to "make it a more relaxed day," and it quickly adjusted the itinerary.
Comprehensiveness	When planning transportation, it provides details like boarding locations, duration, and ticket prices.	It integrates information such as transportation, weather, and attraction opening hours for the day, making travel convenient.
Personalization	"I wanted a plan featuring Guizhou's specialty snacks, and it provided a personalized itinerary, recommending unique attractions and culinary resources.	We are a family traveling with children, and it tailored an itinerary featuring activities suitable for kids."
Accuracy	I set a specific budget, and it calculated expenses down to each meal, helping avoid overspending	It clearly understood my travel preferences and marked specific points according to my requirements
Efficiency	It consolidated information about the places I wanted to visit and created a plan within minutes.	I didn't need to spend much time searching or organizing information; I simply provided my needs, and it handled everything seamlessly.

Table 7. Examples of Key Dissatisfaction Events

Event Category	Example 1	Example 2
Reasonableness	The itinerary was unreasonable, providing plans that couldn't be directly applied, such as visiting three cities in one day, which required users to revise the itinerary themselves.	The schedule allocated all activities between 8 a.m. and 7 p.m., with no arrangements after 7 p.m.
Flexibility	GAI tools couldn't update transportation or weather information in real-time, leaving me unsure of what to do in unexpected situations during the trip.	When I wanted to adjust one day's itinerary, I had to manually change it myself, as it couldn't automatically adapt to changes.
Comprehensiveness	When traveling to areas with ethnic minorities, they didn't inform us about local customs and traditions, almost leading to conflicts.	The schedule didn't account for uncertainties and sometimes overlooked the fact that we were traveling with children, recommending activities unsuitable for kids.
Personalization	GAI tools tended to recommend popular attractions and mainstream activities, neglecting in-depth experiences and local specialties, making the travel experience superficial.	The recommended plan didn't align with my preferences and was no different from generic plans available in the market, lacking uniqueness.
Accuracy	When I followed the route planned by GAI tools, I found that some areas were under construction, requiring me to take a large detour.	For a 5-day, Xiamen family trip, the suggested hotel lacked nearby children's facilities, recommended attractions' visit durations were inaccurate, and special period traffic control information was incorrect, disrupting the trip.
Timeliness	Transportation schedules, attraction opening times, and accommodation prices often change, and GAI tools' updates are not always timely.	The information used to make the plan didn't match what I found onsite, as it hadn't been updated in time.

The subsequent study further analyzed and categorized the data collected from participants. Among the key events of satisfaction, events related to completeness accounted for the highest average proportion at 22.99%, followed by events related to personalization at 19.54%. Reasonableness accounted for 17.24%, while precision accounted for 16.09%. Events related to flexibility accounted for 12.64%, and those related to efficiency had the smallest proportion at 11.49%. Among the key events of dissatisfaction, those related to reasonableness accounted for the highest proportion at 23.26%, followed by completeness at 21.84%. Events related to accuracy accounted for 18.39%, while flexibility made up 13.79%. Events related to personalization and timeliness had similar proportions, at 11.49% and

10.34%, respectively. These data suggest that for both satisfaction and dissatisfaction, completeness and reasonableness hold relatively high proportions, indicating that users place great importance on these two aspects when using GAI tools for travel planning. Focusing on optimizing reasonableness and completeness could maximize user experience improvements.

5. Conclusions and Recommendations

5.1 Conclusions

This study adopts the CIT method, focusing on applying GAI tools for travel planning and exploring its impact on users' perceptions. Research data reveals that eight dimensions of GAI tools applications on travel planning - rationality, comprehensiveness, flexibility, personalization, precision, accuracy, timeliness, and efficiency, affect users' experience collectively. Among the satisfaction factors, the most significant facets are comprehensiveness, personalization, and rationality. Conversely, among the dissatisfaction factors, the most significant facets are rationality, comprehensiveness, and accuracy.

5.2 Recommendations

5.2.1 Recommendations for the Development of AIGC-Related Travel Planning Functions

Overall speaking, GAI tools need to further optimize their functions to enhance user experience and improve user retention. This study offers four recommendations to improve user experience: first, guide users to express their needs. When users use GAI tools for travel planning, information omissions or unclear expressions are inevitable, leading to imperfect planning. In such cases, the intelligent chatbot in the program can ask users questions to capture all their requirements, thereby improving the travel plans. Second, providing users with channels to verify information. Although the program can capture and filter useful information from web pages and relay it to users, it cannot ensure the accuracy of all information. Therefore, while providing users with travel plans, the program can offer methods for verification, such as providing attraction contact numbers. This facilitates travelers in confirming and adjusting their itineraries later, ensuring the maximum execution rate of the travel plan. Third, offer multiple travel plans with corresponding advantages and disadvantages. Different arrangements within the same timeframe yield different outcomes, and each user has their preferred setup. Hence, when providing travel plans, the program can present various options along with their respective pros and cons for users to choose based on their personal circumstances. Fourth, proactively provide users with more detailed information. During the execution of travel plans, users may overlook many detailed elements, such as weather changes, cultural conflicts, food preferences, and attraction opening and closing hours. On this point, the program can add prompts at corresponding positions in the travel plans to improve the user's comfort during execution.

5.2.2 Recommendations for Users

Artificial intelligence represents a major trend for the future, and using GAI tools in this context is inevitable. Based on this, the study offers four recommendations for users: first, actively learn the skills to use GAI tools. Blindly using such tools may not necessarily yield

satisfactory travel itineraries and might even require significant time to modify and adjust further. Therefore, users should proactively learn how to use GAI tools and to effectively obtain appropriate travel plans within a short time frame. Second, maintaining a mindset of verification. Although information provided by GAI tools is filtered, it does not guarantee complete accuracy. As such, users should still verify the itinerary after receiving it to ensure its subsequent execution. Third, preparing backup travel plans. While GAI tools can provide users with suitable and highly executable travel itineraries, unforeseen situations may still arise. Users should adopt a mindset of preparedness and prepare backup plans to encounter uncertainties during their itinerary.

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