

Autonomous travel decision-making: An early glimpse into ChatGPT and generative AI

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ABSTRACT

Generative AI technologies, including large language models (LLMs), have the potential to bring significant advancements to the tourism and hospitality industry through an array of ingenious features. ChatGPT, as a type of generative AI, is a state-of-the-art LLM that is bundled with extensive capabilities. This commentary provides an early snapshot of ChatGPT's ability to enhance the tourist decision-making process in the pre-trip, en-route, and post-trip stages. Particularly, ChatGPT greatly differentiates itself from the traditional travel decision-making process by putting the tourist in the driver's seat to actively probe for highly relevant information through a question-and-answer mode. In this research note, we present different scenarios with cases demonstrating how ChatGPT can improve tourists' experience in these three travel stages, with trip planning efficiency, customized recommendations, 24/7 personal assistant, AI-mediated communication fluency, autonomous guided tours, enriched sharing experience, and AI-induced prolonged satisfaction. In summary, these value-added autonomous services provide tourists with travel solutions that are highly cost-effective, offering customized information that allows them to travel with ease.

1. Introduction

In today's competitive world, the tourism/hospitality industry has been exploring new avenues to be more appealing to a broader audience (Altinay & Kozak, 2021). To this end, the emergence of generative artificial intelligence (GAI) has brought transformative changes to the industry, allowing businesses to create novel experiences that blend virtual and physical environments (Mondal et al., 2023). For instance, GAI applications are able to boost customer engagement and loyalty, customize travel plans, optimize the management of tourism companies, and provide other benefits (Carvalho & Ivanov, 2023; Iskender, 2023; Mondal et al., 2023). GAI is a type of AI technology, which aims to develop machines capable of reasoning and acting like human beings (Deng & Lin, 2022; Gimpel et al., 2023). There are different kinds of AI applications, and they mainly rely on machine learning, deep learning, and natural language processing (NLP). Machine learning depends on advanced algorithms to analyze data and identify patterns that can be used to make predictions (Ahani et al., 2021). Deep learning leverages neural networks to analyze and learn from vast amounts of data (He

et al., 2021). NLP is an AI approach that employs algorithms to comprehend and produce words and sentences that can be understood by humans, thus simulating human-like conversations (Deng & Lin, 2022).

In November 2022, ChatGPT (Chat Generative Pre-training Transformer) (Team, 2022), a new generation of AI technology, was launched and received more than 100 million active users signing up in just two months. It has sparked a new wave of global discussion across various academic disciplines (Gilson et al., 2022). ChatGPT is a general-purpose chatbot based on OpenAI with the ability to "generate human-like text" (Aydin & Karaarslan, 2022). Accordingly, it is referred to as generative AI to credit its ability to produce new contents in the form of human-like discourse. ChatGPT is a conversational user interface (or application programming interface [API]) that is built on top of the GPT large language model (LLM), which empowers AI applications to generate texts and images, based on Open AI (Gimpel et al., 2023).

The GPT model undergoes training utilizing a vast corpus of text data, being subjected to unsupervised learning methodologies, which enables the system to detect the statistical patterns and regularities of

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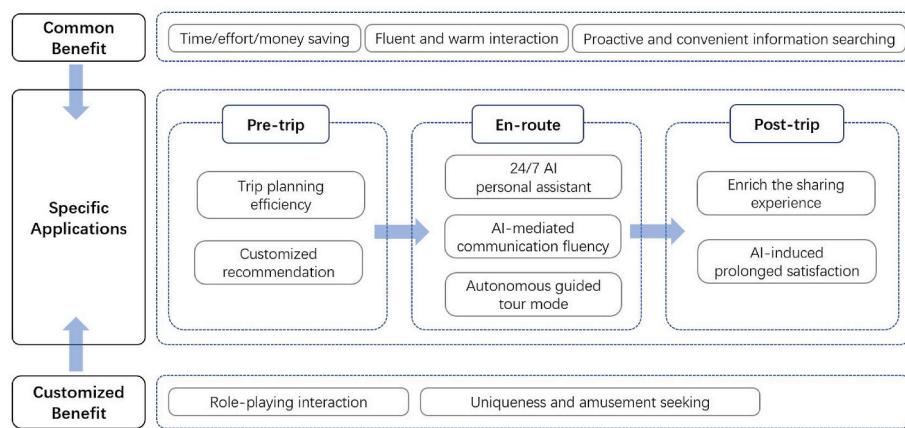


Fig. 1. The role of ChatGPT in different travel stage.

human language. Subsequently, the GPT model employs this understanding to generate contextually relevant and coherent responses in response to the user's input (Van Dis et al., 2023). During conversations, once a user enters a message or question in the ChatGPT interface, the GPT language model uses this knowledge to predict and generate personalized responses based on the inputted text (Dwivedi et al., 2023). As the leading AI language model, GPT-4 (i.e., the latest iteration as of this writing) has multimodal capabilities to handle multiform task inputs such as text and image, and even displays human-level performance under a variety of professional and academic metrics (Bubeck et al., 2023). More importantly, it is capable of accurate reasoning and can refine logical mistakes in reasoning to produce timely and valuable responses (Lee et al., 2023).

The emergence of ChatGPT has opened the virtual Pandora's Box of the "strong AI era." This breakthrough of ChatGPT is based on a self-generated LLM, a machine-learning system that learns autonomously from data to produce complex and seemingly intelligent writing after training on large textual datasets (Van Dis et al., 2023), which can address many shortcomings of traditional AI programs. It is equipped with superb general AI and natural language processing capabilities to benefit and be applicable in various academic domains including medical care, education training, scientific research, essay writing, and more (Alkaissi & McFarlane, 2023; Lund & Wang, 2023; Rao et al., 2023; Thorp, 2023).

Given the infancy of generative AI, such as ChatGPT and other applications, it is prudent to explore its potential to revolutionize the tourism industry. This is especially important when there is a lack of research investigating how such a tool could bring new opportunities to the field (Carvalho & Ivanov, 2023). That said, this commentary aims to foster a forum of discussion on generative AI using ChatGPT as an example to better discern how it could bring new reevaluations to the tourism industry. In particular, we focus on the tourist travel decision-making process, given its importance in scholarly writing since the late '80s (Crompton, 1992; Moore et al., 2012; Woodside & Lyonski, 1989), as well as an array of opportunities that could benefit both tourists and operators. This commentary thus serves as a pathfinder by providing a comprehensive overview of how ChatGPT can be utilized as a "digital secretary or assistant" (Stokel-Walker & Noorden, 2023, p. 215) for tourists in the pre-trip, en-route, and post-trip travel encounters.

2. ChatGPT in the travel stages

According to the full temporal dimension, travel can generally be regarded as a three-stage process including pre-trip, en-route, and post-trip encounters (Fodness & Murray, 1998; Tsang et al., 2011). In their discussion of the use of GAI in the customer experience journey, Mondal

et al. (2023) emphasize that the customer journey comprises several distinct phases, beginning before using GAI, then during use, and post-use. Tourism stakeholders can leverage the benefits of GPT to perform various tasks across different stages of the tourist journey, including before, during and after trips (Carvalho & Ivanov, 2023). Therefore, here we outline some plausible roles of ChatGPT in adding value to tourist experience through these stages. Fig. 1 summarizes such benefits.

2.1. Pre-trip stage

Trip planning efficiency. Travel planning is a process in which tourists probe for relevant information, develop a set of place choices, draw evaluations, and make appropriate decisions (Crompton, 1992; Xiang et al., 2015). Effective trip planning is essential for tourists to make informed decisions and build anticipation for their upcoming trips (Gretzel et al., 2006). Travelers heretofore have obtained information through various sources, including online and traditional travel agencies (Aguiar-Quintana et al., 2016), travel websites (Wu, 2018), recommendations from friends and family members (Goodrich & De Mooij, 2014), and social media (e.g., travel blogs) (Sun et al., 2021). Despite an abundance of available information from these sources, identifying valuable information and making the right decision can still be challenging and time-consuming. Tourists must sift through an overwhelming amount of details, which can be costly and time-consuming while filtering and evaluating them.

ChatGPT, however, provides comprehensive answers to complex queries based on advanced analysis, synthesis, and application based on different information sources (Susnjak, 2022). By analyzing the preferences and needs of tourists based on their conversations and feedback, ChatGPT can quickly and accurately process data from various travel websites, and provide cost-effective destination information and recommendations ranging from attractions, food, accommodations, and transportation (Carvalho & Ivanov, 2023). For example, one may seek to travel to a popular destination in the Polynesian islands with three destination choices (e.g., Hawaii, Fiji, and Palau) in mind for a 5-day vacation under a \$2000 budget. ChatGPT (see Fig. 2) can provide tourists with a list of options ranging from transportation to accommodation among the three places. It could also offer advice on the optimal choice given specific parameters (e.g., time and budget). If one decided to visit Honolulu, Hawaii as the best option recommended by ChatGPT, tourists could further request a detailed travel itinerary for a daily sightseeing schedule (see Fig. 3).

Furthermore, ChatGPT has plugins that allow for integration with other travel applications (Liang et al., 2023). This means that tourists no longer need to visit multiple travel apps repeatedly to plan their trips. Instead, ChatGPT can help tourists in booking attraction admission

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I am planning an island trip for 5 days and currently deciding between 3 islands Hawaii, Fiji and Palau, I am traveling from New York and have a travel budget of \$2000. Please help me compare these 3 islands and recommend the most suitable one, including the recommended hotels and flights, and show it in a table



	Hawaii	Fiji	Palau		
Flight Cost	~\$800 (round trip from NYC)	~\$1000 (round trip from NYC)	~\$1200 (round trip from NYC)		
Visa Requirements	None for US citizens	None for US citizens	Visa on Arrival for 30 days		
Language Spoken	English and Hawaiian	English and Fijian	English and Palauan		
Currency	US Dollar	Fijian Dollar	US Dollar		
Weather	Tropical climate with average temperature 28°C	Tropical climate with average temperature 27°C	Tropical climate with average temperature 28°C		
Popular Attractions	Waikiki Beach, Pearl Harbor, Volcanoes National Park	Coral Coast, Mamanuca Islands, Sigatoka Sand Dunes	Jellyfish Lake, Rock Islands, Ngardmau Waterfall		
Accommodation Options	Hotels, Resorts, Hostels, and Airbnb	Hotels, Resorts, Hostels, and Airbnb	Hotels, Resorts, Hostels, and Airbnb		
Average Hotel Cost/Night	\$100-\$300	\$50-\$200	\$50-\$150		
Food Options	Hawaiian, American, and Asian cuisine	Fijian, Indian, and Chinese cuisine	Palauan, American, and Japanese cuisine		

Based on the table, Hawaii seems to be the most suitable option for a 5-day island trip with a budget of \$2000. It offers a variety of popular attractions, including Waikiki Beach, Pearl Harbor, and Volcanoes National Park. Flights to Hawaii are also the most affordable, with a round trip cost of approximately \$800 from NYC. Additionally, there is no visa requirement for US citizens to enter Hawaii.

For accommodation options, Hawaii offers a range of choices from hotels, resorts, hostels, and Airbnb, with an average cost of \$100-\$300 per night. Food options are diverse, with Hawaiian, American, and Asian cuisine available.

As for Fiji and Palau, they also offer beautiful tropical weather and a variety of popular attractions, but the flight costs are higher, and there are visa requirements for Palau. Additionally, accommodation and food costs in Fiji and Palau can be higher than in Hawaii.

Therefore, based on the factors above, Hawaii would be the best choice for a 5-day island trip with a budget of \$2000, providing a good balance between affordability, popular attractions, and diverse options for accommodation and food.

Fig. 2. ChatGPT generated destination choice comparison.
Source: Author's conversation with ChatGPT

15 OK, then please help me develop a detailed 5 day Honolulu, Hawaii tour with a budget of \$2000, including recommended flights, attractions, hotels, restaurants and transportation, and present it in a table.

Day	Activities	Accommodation Options	Restaurant Recommendations	Transportation Options
Day 1	Fly from New York to Honolulu, check into hotel, explore Waikiki Beach and Diamond Head	Budget hotels, hostels, and Airbnb rentals	Duke's Waikiki, Rainbow Drive-In	Public transportation, ride-sharing services
Day 2	Visit Pearl Harbor and USS Arizona Memorial, hike in Manoa Falls	Budget hotels, hostels, and Airbnb rentals	Helena's Hawaiian Food, Ono Hawaiian Food	Public transportation, ride-sharing services
Day 3	Take a day trip to the North Shore, visit the Dole Pineapple Plantation and Haleiwa	Budget hotels, hostels, and Airbnb rentals	Giovanni's Shrimp Truck, Kahuku Superette	Public transportation, ride-sharing services
Day 4	Visit the Hawaii Volcanoes National Park, see the active Kilauea volcano	Budget hotels, hostels, and Airbnb rentals	Kilauea Lodge, Thai Thai Bistro	Car rental or public transportation
Day 5	Explore downtown Honolulu, visit Iolani Palace and the Bishop Museum, fly back home	Budget hotels, hostels, and Airbnb rentals	Hula Grill Waikiki, The Pig and The Lady	Public transportation, ride-sharing services

For flights, it's recommended to book in advance and look for deals from airlines such as Hawaiian Airlines or Delta. Flights from New York to Honolulu can cost around \$600-800, leaving around \$1200-1400 for the rest of the trip.

For accommodation options, there are several budget-friendly hotels, hostels, and Airbnb rentals available in Honolulu. Prices can range from \$50-\$100 per night, depending on the location and amenities.

On Day 1, visitors can explore the famous Waikiki Beach and hike to the top of Diamond Head for breathtaking views of the ocean and city. For dining options, Duke's Waikiki and Rainbow Drive-In offer affordable and delicious meals.

On Day 2, visitors can pay tribute to those lost at the USS Arizona Memorial and hike through the Manoa Falls trail. For dining options, Helena's Hawaiian Food and Ono Hawaiian Food offer authentic and flavorful Hawaiian cuisine at affordable prices.

Day 3 offers a chance to take a day trip to the North Shore and visit the Dole Pineapple Plantation and the charming town of Haleiwa. For dining options, Giovanni's Shrimp Truck and Kahuku Superette offer affordable and tasty meals.

On Day 4, a trip to the Hawaii Volcanoes National Park offers a chance to see the active Kilauea volcano and explore the unique landscape of the park. For dining options, Kilauea Lodge and Thai Thai Bistro offer affordable options for breakfast, lunch, and dinner.

Finally, on Day 5, visitors can explore downtown Honolulu, visit Iolani Palace, and learn about Hawaii's rich history at the Bishop Museum before flying back home. For dining options, Hula Grill Waikiki and The Pig and The Lady offer affordable and delicious meals.

For transportation, visitors can use public transportation or ride-sharing services like Uber or Lyft to get around Honolulu. Renting a car is also an option for Day 4, but it may increase the overall budget.

Fig. 3. ChatGPT generated trip.

Source: Author's conversation with ChatGPT

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Now let's play an identity game. You are a local resident of Honolulu, Hawaii, can you recommend local specialties and local favorite attractions to me?



Certainly! As a local resident of Honolulu, Hawaii, I would love to recommend some local specialties and favorite attractions for you to experience.



When it comes to local specialties, poke is definitely a must-try dish. This popular Hawaiian dish features fresh, raw fish that's been marinated in a flavorful sauce and served over rice. You can find poke at many local restaurants and markets throughout Honolulu.

Another local specialty that's a favorite among locals is loco moco. This hearty dish consists of a bed of rice topped with a hamburger patty, a fried egg, and brown gravy. It's a delicious and filling meal that's perfect for breakfast, lunch, or dinner.

When it comes to favorite attractions, one place that's always popular with locals is the North Shore of Oahu. This scenic area is known for its world-class surfing, beautiful beaches, and laid-back vibe. You can spend the day soaking up the sun, watching surfers ride the waves, and sampling some of the area's delicious food trucks.

Another favorite attraction among locals is the Honolulu Museum of Art. This impressive museum features a diverse collection of art from around the world, including works by local Hawaiian artists. It's a great place to spend a rainy afternoon or to take a break from the beach.

For outdoor enthusiasts, the Makapu'u Lighthouse Trail is a must-visit. This scenic hiking trail leads to a historic lighthouse and offers stunning views of the coastline. It's a relatively easy hike that's suitable for hikers of all skill levels.

I hope these recommendations give you a taste of some of the local specialties and favorite attractions that Honolulu has to offer!

Fig. 4. Travel recommendation for tourists as a resident.

Source: Author's conversation with ChatGPT

The screenshot shows a ChatGPT interface with two messages. The first message is from the user: "I'm traveling in Honolulu, Hawaii, and suddenly I'm not feeling well. What should I do now?". The second message is from ChatGPT: "If you're feeling unwell while traveling in Honolulu, Hawaii, the first thing you should do is seek medical attention. Here are some steps you can take:

1. Find the nearest medical facility: Look for the closest hospital or urgent care center and go there immediately. You can ask for directions from the hotel staff or locals.
2. Call for medical assistance: If you are unable to move or require urgent medical attention, call 911 or the emergency services in Hawaii. Explain your situation, your location and follow their instructions.
3. Inform your travel companions or family: Let your traveling companions or family members know that you are not feeling well and where you are going for treatment. They can provide you with support or assistance.
4. Bring important documents: Bring any important medical documents, such as your health insurance card or a list of medications you're taking, to the hospital or urgent care center.
5. Follow medical instructions: Once you receive medical attention, make sure to follow the doctor's instructions carefully, take any prescribed medication, and rest until you are feeling better.

It's essential to take your health seriously while traveling, and seeking medical attention promptly can help you recover quickly and avoid any further complications.

The second message is from the user: "I am living in seaside Hawaiian Hostel now. Could you please help me find the nearest hospital". The response from ChatGPT is: "Of course, I can help you with that! The nearest hospital to Seaside Hawaiian Hostel is: The Queen's Medical Center - Punchbowl Address: 1301 Punchbowl St, Honolulu, HI 96813, United States Phone: +1 808-691-1000". Below this, ChatGPT adds: "It's about 2.6 miles (4.2 km) away from Seaside Hawaiian Hostel, and the estimated travel time is around 10-15 minutes by car, depending on traffic. You can use a taxi or ride-sharing service like Uber or Lyft to get there quickly." Finally, ChatGPT concludes with: "If you need any further assistance or have any other questions, feel free to ask!"

Fig. 5. Emergency Advice in case of Health Issues.

Source: Author's conversation with ChatGPT

tickets, making hotel reservations, checking air flight schedules, and even selecting meals that tourists prefer. It is important to note that users of the app can request ChatGPT to refrain from specific itineraries, or to further refine details of each specific recommendation.

The advantages of GPT in the pre-trip phase have disruptive impacts to the traditional information acquisition process. It expedites information filtering and evolution by reducing the amount of irreverent information. It thus helps save tourists' valuable time, effort, and money, while increasing the efficiency of their decision-making.

Customized recommendations. Previous studies have informed that travel blogs and online reviews are avenues that have gained popularity as sources for travel information acquisition (Sun et al., 2021; Wu et al., 2021). Recommendations from these social media sources can in turn induce favorable travel intention behaviors (Tong et al., 2023). Although social media provides an excellent conduit for tourists to obtain travel information, they still need to make evaluations based upon different information sources. This process could lead to

information overload and may often cause confusion (Lu & Gursoy, 2015).

ChatGPT utilizes neural networks to process natural language and can generate fine-grained and professional responses based on specific contexts (Haleem et al., 2022). Once a tourist inputs his or her travel queries, ChatGPT can filter and prioritize vast amounts of online travel-related data based on their responses, and recommend customized travel products. This function greatly alleviates tourists' effort in searching for information and improves their travel experience and satisfaction. Moreover, ChatGPT generates responses that are tailored to specific user inputs, thus providing personalized recommendations to each tourist (Gursoy et al., 2023). The use of ChatGPT represents a significant step towards delivering more personalized and targeted recommendations to tourists. More importantly, unlike previous algorithmic AI, ChatGPT can assume a variety of roles (Chatterjee & Dethlefs, 2023; Värtinen et al., 2022), such as a tour guide, a local resident, or a travel blogger, all depending on personal needs. Different referrers

15 私は日本人観光客ですが、ネイティブハワイアンに挨拶するとき、どのように表現すればいいのでしょうか？

 ハワイアンに挨拶する場合、一般的な挨拶は「アロハ」と言います。これは「こんにちは」や「さようなら」など、様々な意味を持つ多目的な挨拶です。

また、挨拶に際しては、相手に敬意を表するために「お」という敬称をつけることが一般的です。例えば、女性の場合、「おはようございます」と言います。

さらに、ハワイでは多様な文化が混在していますので、場合によっては異なる挨拶が適切な場合もあります。例えば、ハワイ在住の日本人に対しては、「こんにちは」や「おはようございます」といった一般的な日本語の挨拶を使うこともできます。

その他にも、親しみを込めた挨拶として「マハロ」（ありがとう）や「メリークリスマス」（クリスマスの挨拶）などがあります。挨拶に際しては、相手との関係や場面に合わせて適切な挨拶を選ぶようにしましょう。

15 ハワイのネイティブの人々に、地元のおすすめ料理を教えてもらいたいのですが、ハワイ語で相談するにはどうしたらいいでしょうか？

 ハワイのネイティブの人々に、地元のおすすめ料理を教えてもらいたい場合、ハワイ語で相談することができます。

まずは、「地元のおすすめ料理を教えてください」という意味のフレーズを覚えておきましょう。それは「'Olelo mai i nā mea 'ono o kēia wahi」です。

次に、相手が教えてくれた料理名が分からなかった場合でも、聞き返すことができるよう、「それは何という料理ですか？」というフレーズも覚えておくと良いでしょう。それは「'O wai kēlā mea 'ono?」です。

また、ハワイ語で食べ物の種類を覚えておくことも役立ちます。例えば、「フライドライス」は「pālau」、「ロコモコ」は「lokomoakō」、「ポキ」は「poki」といったようになります。

以上のように、ハワイ語でのコミュニケーションには、基本的なフレーズや食べ物の種類を覚えることが大切です。また、相手に対して敬意を示すために、挨拶の際には「アロハ」と言うことも忘れずに。

Fig. 6. ChatGPT-mediated communication as a foreign language.

Source: Author's conversation with ChatGPT

usually have their specific advantages; for example, the perspective of a resident can allow the tourist to grasp a more authentic and immersive travel experience in a local community (Chen & Rahman, 2018). By having options to act as different characters in ChatGPT, one could instill and receive personalized travel recommendations to better plan one's trips. Fig. 4 presents a customized trip plan for the author from the point of view of a resident.

2.2. En-route stage

24/7 AI personal assistant. Travel decision-making does not end during the pre-trip stage. In-destination decisions are a major part of the travel process, in which tourists expedite their choices regarding accommodations, attractions, transportation options, restaurants, and more on site (Moore et al., 2012). Such an ad hoc decisional approach is often facilitated by access to a wide variety of information en route through tourists' smartphones (Yu et al., 2018; Zhang et al., 2020). Tourists are increasingly more reliant on in-destination decisions not only because they are empowered by smartphones, but such a

decision-making process can help them to better respond to emergencies and unexpected events in an unfamiliar environment, such as over-crowding and congestion (Papadopoulou et al., 2023), poor weather, and health issues.

ChatGPT enables self-service capabilities across a wide range of processes compared to single-featured chatbots (Carvalho & Ivanov, 2023). When tourists encounter problems and need immediate assistance during their trips, ChatGPT can act as a personal assistant to offer streamlined and timely 24/7 communication in different languages. Assume that one encounters a medical emergency during a trip to Hawaii. GPT's advice for medical assistance provides a glimpse of what a tourist should know in handling such an adversity (see Fig. 5). What's even more surprising is that, like humans, it has "memory" and can effectively remember people's past interactions with it and recall past comments—a feature that ordinary AI models lack (Chatterjee & Dethlefs, 2023). This function is particularly beneficial for tourists who are exploring unfamiliar places and want to make the most of their time, or for last-minute planning. ChatGPT can incorporate travelers' previous preferences and provide them with the most relevant and updated (i.e.,

15 I'm interested in Pearl Harbor in Hawaii. Now, as a tour guide, please introduce the history of this scenic spot

Sure, I'd be happy to give you a brief overview of the history of Pearl Harbor in Hawaii.

Pearl Harbor is located on the island of Oahu in Hawaii and is a historic naval base that played a pivotal role in the United States' involvement in World War II. On December 7, 1941, Japanese forces launched a surprise attack on Pearl Harbor, which resulted in the destruction of many American ships and aircraft, as well as the loss of thousands of American lives. This attack prompted the United States to enter World War II.

After the attack, the United States began to rebuild the naval base, and Pearl Harbor became a crucial base for the US Navy throughout the war. Today, Pearl Harbor is home to several historic sites and museums that commemorate the events of that fateful day. Some of the most popular attractions include the USS Arizona Memorial, the Battleship Missouri Memorial, and the Pacific Aviation Museum.

The USS Arizona Memorial is built over the remains of the sunken battleship USS Arizona, which is the final resting place of more than 1,100 sailors and Marines who lost their lives during the attack. The memorial provides visitors with a somber and reflective experience, as they learn about the attack and pay their respects to those who lost their lives.

The Battleship Missouri Memorial is a decommissioned battleship that was once the site of the signing of the Japanese surrender that ended World War II. Visitors can take guided tours of the ship and learn about its history and significance.

The Pacific Aviation Museum features a collection of aircraft from World War II, as well as exhibits that highlight the history of aviation in Hawaii. Visitors can take a tour of the museum and learn about the role that aviation played in the war effort.

Overall, Pearl Harbor is a fascinating and important destination for anyone interested in learning about World War II history and the impact that the attack had on the United States.

Fig. 7. ChatGPT-generated tour guide interpretation.

Source: Author's conversation with ChatGPT

up to 2021) information about local attractions, restaurants, and activities by accessing a vast amount of Internet resources.

AI-mediated Communication Fluency. Besides health and other personal issues, communication challenges in the travel encounter are commonly reported in the literature (McKercher & Darcy, 2018). These adversities may range from language barriers and cultural discrepancies to failure to acquire authentic experience due to lack of understanding about a local place and culture (Lu et al., 2021).

ChatGPT, however, can help to ease the language and cultural barriers, while fostering greater cultural understanding in a new environment. This is because generative AI such as ChatGPT is empowered by large language model (LLM), which provides applications the ability to offer accurate and reliable translations of information related to local customs and language expressions. Fig. 6 provides an example of how ChatGPT can act as a Japanese tourist consulting native Hawaiians about local food. This reflects a promising solution for bridging the communication gap between tourists and residents. Furthermore, the personalized communication experience offered by ChatGPT enables the chatbot to interact with tourists in a manner that is both intelligent and emotionally engaging (Chatterjee & Dethlefs, 2023). The chatbot responds with references to movies or literature, or interacts with people

in a specific language style (e.g., Shakespearean) with the right prompt (Carvalho & Ivanov, 2023). By providing a more engaging and localized communication experience, ChatGPT can help to dispel any preconceived notions that tourists may have about chatbots being dull or unresponsive (Engineering and Technology, 2022), while simultaneously improving the fluency of communication between tourists and AI services.

Autonomous guided tour. Tour guiding and interpretation are value-added services that can facilitate a memorable travel experience (Huang et al., 2015). However, the quality of tour guides can be disappointing, while their interpretation of a place could be biased (Reisinger & Steiner, 2006). Encountering such services could spoil the tourist experience to a certain extent.

ChatGPT can access a large web of resources, obtain updated information, and supply comprehensive knowledge that surpasses any human tour guide in terms of accuracy and depth. It can offer tourists an accurate introduction to the history, culture, and statistics of places and products around the globe regardless of the time and language. Specifically, ChatGPT can offer customized guiding services based on tourists' preferences, whether it is a natural landscape, a heritage attraction, or a souvenir store. For example, the authors asked ChatGPT to introduce

Sure, here are some ideas for an elegant caption with emojis:

1. 🌴☀️📍 Back from an amazing 5-day trip to Hawaii! From lounging on the stunning Waikiki Beach to hiking up Diamond Head and witnessing the power of Hawaii's volcanoes, this adventure was truly unforgettable.📸💡 #HawaiiVacation
2. 🌺🏝️📸 Just got back from a magical trip to Hawaii! The Pearl Harbor memorial was incredibly moving, and the Hawaii Volcanoes National Park was a sight to behold. Can't wait to share more photos from this incredible journey.📸💡 #HawaiiAdventure
3. ☀️🌈📍 Aloha from Hawaii! My 5-day adventure was a dream come true. The sunsets were breathtaking, the beaches were gorgeous, and the people were so friendly. Mahalo, Hawaii! 🌺🌴 #HawaiiTravel
4. 🚗📍📍 From Pearl Harbor to the Hawaii Volcanoes National Park, this trip was a perfect blend of history and natural wonder. I'm so grateful for the opportunity to explore this incredible place.📸💡 #HawaiiVacation
5. 🏝️📸📍 Just returned from a paradise-like 5-day adventure in Hawaii! Snorkeling with the dolphins and sea turtles at Waikiki Beach was an experience I'll never forget. Can't wait to go back! 🌟📸 #HawaiiGetaway

I hope these ideas help you create an elegant caption with emojis for your Hawaii adventure!

Fig. 8. ChatGPT-generated social media post.

Source: Author's conversation with ChatGPT

Pearl Harbor as a tour guide (see Fig. 7 for details). Such an autonomous tour guide service represents a disruptive change to traditional tourism models that are primarily rely on human staff. Rather, generative AI empowers tourists to take charge of their own travel experiences. This personalized tour guide model not only can improve the quality of trips, but it can also help tourists to co-create travel memories. As Carvalho and Ivanov (2023) state, the establishment of this self-sovereign identity (SSI), supported by generative AI recommendations, can greatly increase the overall value and satisfaction of the users.

2.3. Post-trip stage

Enrich sharing experience. Although the post-trip stage is not generally regarded as part of the decision-making process, it nevertheless allows tourists to share their decisions, experiences, and memories (Yu et al., 2018). In particular, social media has enabled tourists to disseminate a variety of travel contents and empowers them to co-create knowledge for other tourists (Lever et al., 2021). Empirical studies have demonstrated that online sharing behavior facilitates positive outcomes, such as enhanced subjective well-being (Xu & Zhang, 2021), impulsive travel intentions (Yao et al., 2021), and favorable evaluations for future decisions (Kim & Fesenmaier, 2017). However, tourists often face travel limitations (e.g., time, knowledge, and ability) in presenting their experiences in a compelling way. Fortunately, the ChatGPT can help generate "human-like text" based on specific prompts (Carvalho & Ivanov, 2023; Chui et al., 2022; Nautiyal et al., 2023; Taecharungroj, 2023). This capability could help tourists to share their experience with ease. For instance, it could generate social media posts after a trip, write comments for a hotel stay, and craft travelogues that document the entire travel encounter. Furthermore, ChatGPT can offer inspiration for those who wish to share artistic improvisations (e.g. poems, paintings, music pieces). To illustrate these capabilities, the authors requested ChatGPT to generate elegant expressions and a poem about a trip to

Hawaii (see Figs. 8 and 9).

AI-induced prolonged satisfaction. Prior studies have implied that tourism photography and smartphone usage enable individuals to prolong their satisfaction with travel experiences through aide-memoire and smartphone usage (Yu et al., 2018). Yet, the rise of AI-assisted travel satisfaction remains an unclear area of investigation. ChatGPT represents such a tool that can allow tourists to store and retrieve their travel memories with ease. Accordingly, we coin this approach as "AI-induced prolonged satisfaction" to depict the use of AI-powered tools that could lead to long-lasting feelings of contentment by assisting in sharing and recalling travel memories. In particular, ChatGPT could personalize travel recommendations and itineraries, provide real-time guidance and assistance during the trip, and generate high-quality and creative content for social media sharing, as mentioned above. Moreover, ChatGPT could further apply to create AI-generated content (AIGC) including images, videos, 3D graphics, and more (Cao et al., 2023; Du et al., 2023; Liu et al., 2023). The possibilities are virtually endless and hence, ChatGPT presents itself as an avenue that could further entice tourists with lasting memories for their excursions.

3. Conclusions

ChatGPT and other GPT-based applications, as a type of generative AI, are a state-of-the-art LLM that is bundled with extensive capabilities to serve users with a wide range of possible functionalities. This commentary provides an early snapshot of ChatGPT's ability to enhance the tourist decision-making process in the pre-trip, en-route, and post-trip stages. In particular, ChatGPT greatly differentiates itself from the traditional travel decision-making process by putting the tourist in the driver's seat to actively probe for highly relevant information through a question-and-answer (Q&A) mode. Such a Q&A information acquisition process greatly facilitates planning and other decisional steps, as it rescues tourists from searching a vast amount of data, filtering out

v Please help me write a poem about the trip to Hawaii.

Certainly! Here's a poem about your trip to Hawaii:

In the embrace of the ocean,
The trip to Hawaii was so divine.
Warm sunshine and gentle waves,
Breathtaking views that were all mine.

White sand and blue waters,
Embraced this warm and loving place.
The magic of Hawaii filled the air,
I was lost in its captivating grace.

Traditional dance and music,
Accompanied Hawaii's tender care,
Local cuisine and culture,
Added a unique flavor that was rare.

In the adventure of Hawaii,
I experienced nature's magical spell.
Diving, kayaking, and waterfall diving,
Made me feel the world was well.

Hawaii, the paradise of all,
Left an indelible impression in my heart.
I promise to return and explore again,
This warm and loving place, I cannot depart.

Fig. 9. ChatGPT-generated trip-related poem.

Source: Author's conversation with ChatGPT

irrelevant information, and comparing different options. The Q&A format provides a far more natural communication mechanism for users/tourists to better tailor their specific needs and preferences. In summary, it provides tourists with travel solutions that are highly cost-effective, with customized knowledge for any specific travel purpose.

As a highly disruptive innovation, ChatGPT has already bought disruptive changes to the tourism industry. It will continue evolving to provide tourists with greater options to better cater to their ongoing travel interest and demand. By leveraging advanced machine learning algorithms and more up-to-date information in future versions, it will become an indispensable personal assistant for virtually all services, providing tourists with the practical and up-to-date advice. ChatGPT has the ability to assist in natural language understanding, particularly in cases where international tourists may have limited language proficiency. It can generate automated translations that enable tourists to communicate fluently. Furthermore, ChatGPT endeavors to meet individual's uniqueness and amusement seeking at all stages of their journey by offering invaluable assistance.

In summary, generative AI applications advance new revelations about the future of tourism services. A glimpse into ChatGPT's early capabilities showcases how tourists may engage in a completely new travel lifestyle based on an AI-mediated (or event-dominated) decision-making process. Tourists will be geared with superpowered autonomous agents that use their personality, preferences, and past experience as parameters to help organize their activities (e.g., find restaurants that fit certain diet, food, and service preferences). As tourists are empowered to pose virtually any question in such a process, they will no longer be restrained within the current information boundary of conventional

media (e.g., TV, newspapers, books, and radio) and new media (e.g., web pages, social media, podcasts, etc.).

Generative AI challenges the dominance of user-generated content (UGC) to embark on a new era of AI-generated content. This situation will certainly pose a tremendous threat to the current understanding of UGC and influencer marketing (Wong et al., 2022). It would lead to job loss, apathy in social media, and erosion of interpersonal trust. It deserves future research to answer such questions and to investigate how such a practice could be beneficial or harmful to the sustainability of the tourism industry. It should be noted, however, that while ChatGPT may provide prompt responses, they may not be accurate, given that its information sources can be misleading (Alkaissi & McFarlane, 2023; Böhm et al., 2023; Ji et al., 2023). Also, ChatGPT cannot provide a full and rational explanation for its outputs, which brings up problems about transparency and accountability (Mich & Garigliano, 2023). These situations may raise ethical questions, as it is plausible that ChatGPT can be designed with biased responses (Armitage, 2023). Meanwhile, since ChatGPT's knowledge is limited to data up until 2021, it may not have the latest information on any changes or updates that have occurred since then (Deng & Lin, 2022).

When using ChatGPT as a technological tool in the tourism industry, it is also important to consider some other risks that may arise. Issues including limited domain knowledge, ethical considerations, and privacy leakage may have negative impacts on customer experience. For instance, ChatGPT's responses may reflect limitations in the domain knowledge acquired through its training data (Ray, 2023). When it comes to travel-related queries or destinations, it may encounter challenges comprehending colloquial expressions, regional dialects, or

languages it is not trained on. These limitations could result in misunderstandings or misinterpretations of user queries, leading to disappointment and dissatisfaction.

Additionally, as with any AI language model, ChatGPT may reflect prejudices and biases present within its training data (Dwivedi et al., 2023; Li et al., 2023; Paul et al., 2023), making it crucial to ensure that the model does not exhibit any discriminatory or biased behavior. This issue is particularly important when dealing with sensitive topics related to race, gender, or religion within the tourism context. These issues could go viral and be propagated with disinformation to millions and even billions of users, leading to hate, discrimination, crime, and other social consequences (Armitage, 2023). Ultimately, the aforementioned abuses may pose information hazards that can potentially curtail tourist experience, leading to remunerative thinking and unpleasant reminiscences of a trip.

Lastly, considering the capacity of language models to capture personal information, which could lead to potential privacy infringements or harm inflicted upon users (Weidinger et al., 2021). It is important to be mindful of the personal information shared with ChatGPT (Carvalho & Ivanov, 2023), such as travel preferences or booking details, and to implement robust security measures and adhere to privacy regulations to protect user data from unauthorized access or misuse. These challenges should be further investigated in future inquiries. As ChatGPT continues its evolution and improvement, we can anticipate witnessing increasingly remarkable outcomes in the years ahead.

Credit author statement

IpKin Anthony Wong: Writing- Reviewing and Editing. **Qi Lilith Lian:** Writing- Reviewing and Editing, Preparing cases. **Danni Sun:** Writing- Reviewing and Editing, Preparing cases.

Declaration of competing interest

None.

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