

Revolutionizing Tourism in Oman: An AI-Driven Solution for Real-Time Information Access

Mohammed Rashid Mohammed Almezeini¹

20f20375@mec.edu.om¹

Middle East College, Muscat, Oman¹

Abstract. Oman's tourism industry continues to expand as part of the nation's broader efforts toward economic diversification and sustainable growth. Despite this progress, many visitors still struggle to obtain accurate, up-to-date information because relevant details are dispersed across multiple independent platforms. This project introduces a unified web platform supported by an AI-powered chatbot designed to deliver real-time, trustworthy information by drawing content from verified sources, including the Ministry of Heritage and Tourism. Through Natural Language Processing (NLP), the chatbot enables users to access reliable guidance on destinations, accommodations, activities, and events. The proposed system enhances visitor experience, promotes local attractions, and contributes to Oman Vision 2040 by strengthening digital transformation within the tourism sector.

Keywords: Tourism, Artificial Intelligence, Chatbot, Oman Vision 2040

1 Introduction

Tourism is one of the most dynamic sectors in the Sultanate of Oman, shaped by the country's diverse geography, rich cultural heritage, and distinct natural landscapes. Oman's terrain varies significantly from north to south ranging from expansive deserts and mountain ranges to long coastal stretches and fertile plains. The Sultanate overlooks a coastline of approximately 3,165 kilometres, extending from Dhofar in the south to the Strait of Hormuz in the north. This geographical diversity offers numerous opportunities for visitors to explore unique ecosystems, historical locations, and traditions that span thousands of years [1].

Government interest in heritage preservation and tourism development strengthened when Sultan Qaboos assumed leadership, resulting in the restoration of many historical and archaeological landmarks, including castles, forts, and mosques. A major milestone in institutionalizing tourism occurred in 2004 with the establishment of the Ministry of Tourism under Royal Decree No. 61/2004, demonstrating the Sultanate's commitment to elevating tourism as a strategic sector [8]. Further reforms took place in 2020, when Sultan Haitham bin Tariq restructured governmental bodies and merged the Ministry of Heritage and Culture with the Ministry of Tourism, forming the Ministry of Heritage and Tourism [8].

The Ministry's mandate spans a wide spectrum of responsibilities aimed at preserving cultural identity while supporting modern tourism development. These include formulating national tourism policies, managing and restoring historical sites, safeguarding geological heritage, and setting standards for sustainable tourism practices. In parallel, the Ministry develops strategies to enhance visitor experiences, diversify tourism offerings, and promote Oman as a competitive global destination.

Collectively, these efforts reflect Oman's broader ambition to strengthen the heritage and tourism sector, enhance cultural representation, and expand tourism-driven economic opportunities in alignment with national development priorities [9].

2. Problem Statement

Tourists visiting Oman frequently encounter difficulties when searching for reliable information, as relevant details are dispersed across numerous websites and platforms [2]; [7]. This fragmentation makes it challenging to access consolidated and updated data regarding events, locations, and tourism services. Additionally, information about less popular or recently developed destinations is often limited, which restricts tourists from discovering the full range of attractions available in the country. Another common issue relates to identifying the ideal time to visit specific destinations, especially those influenced by seasonal climate variations [7].

2.1 Solutions

To address these challenges, the proposed system will compile information from multiple authoritative sources including the Ministry of Heritage and Tourism, hotels, restaurants, and tourism agencies and present it in a unified and easy-to-navigate platform [3].

The AI-powered chatbot will be integrated with official data providers such as the Ministry of Heritage and Tourism, the Royal Opera House, and the Oman Convention and Exhibition Centre. This ensures users receive real-time, verified details on events, schedules, venues, and other relevant information [3]; [5]; [6].

The platform will also highlight lesser-known or recently established destinations, ensuring tourists have access to diverse and regularly updated recommendations [1]; [4]. Furthermore, the system will offer guidance on optimal visiting times for selected tourist attractions, helping visitors plan their trips more effectively and enjoy an enhanced overall experience.

3. Literature Review

3.1 How artificial intelligence and automated response contribute to improving the tourist experience

Artificial intelligence (AI) and chatbot systems have become essential tools for users seeking quick and accurate information [5]; [6]. In the tourism sector, AI-driven applications, including virtual and augmented reality, have enhanced the overall visitor experience by simplifying access to tailored recommendations. These technologies assist tourists by suggesting destinations, accommodations, restaurants, and activities that align with their preferences [3]; [4]. They can also highlight festivals, cultural events, and seasonal attractions that coincide with a visitor's travel dates. By offering instant guidance and minimizing the time spent searching across multiple sources, AI-powered solutions address common challenges such as information overload and inconsistent service quality [3]; [5]. As a result, they significantly improve convenience, efficiency, and satisfaction for travellers.

3.2 Enhancing tourism marketing and tourists' interaction with tourism agencies

Information and Communication Technology (ICT) play a transformative role in the tourism industry, influencing everything from trip planning to real-time engagement with service providers [7]. Research shows that digital technologies enhance operational efficiency and strengthen the relationship between tourists and tourism agencies. By analysing user data, service providers can gain deeper insights into visitor preferences and tailor their offerings accordingly. Technologies such as augmented reality (AR) and virtual reality (VR) enrich tourist experiences by allowing users to preview attractions, cultural sites, and natural landscapes before physically visiting them [4]. Additionally, digital marketing strategies and social media platforms have become vital tools for promoting destinations, shaping consumer decisions, and developing innovative marketing approaches. These technologies collectively contribute to sustainable tourism development and the modernisation of the tourism industry.

3.3 Smart Tourism Marketing

This study highlights the rise of smart tourism also referred to as e-tourism which leverages advanced technologies to enhance the efficiency and appeal of tourism services [1]; [2]. The authors emphasise how digital tools enable personalised travel experiences by continuously improving systems that support destination promotion, user interaction, and online reservations. Smart tourism platforms allow visitors to explore locations virtually, compare services, and make bookings from anywhere, thereby reshaping traditional tourism models [1]; [7]. The integration of social media further amplifies marketing efforts by enabling the widespread sharing of photos, videos, and experiences. However, the authors also address challenges such as privacy concerns, cybersecurity risks, and the need for specialised workforce training to manage these evolving digital tourism systems effectively.

4. Methodology

This research adopts a framework commonly used in both software and non-software projects, where development is divided into a series of dynamic and repeatable phases referred to as sprints [10]. The methodology follows an iterative structure, enabling the team to regularly reassess progress at the end of each cycle and introduce refinements wherever necessary. Instead of delivering the entire system at once, components are produced incrementally, allowing for continuous updates and ensuring the project can adapt to changing requirements. This approach increases project efficiency by incorporating stakeholder feedback at every stage. Its core strengths lie in flexibility, collaboration, and the ongoing pursuit of improvements that ultimately enhance user satisfaction [10].

Table 1. SWOT Analysis of framework

| Strengths | Weaknesses |
|--|---|
| <ul style="list-style-type: none">• Capable of adapting quickly to real-time changes• Breaks the work into manageable phases• Enables incremental delivery of research outputs• Updates or modifications do not disrupt the entire project | <ul style="list-style-type: none">• Requires strong planning and consistent organization• Relies heavily on frequent communication with stakeholders• Coordination becomes challenging with larger teams• Less suited for projects with fixed or fully predefined requirements |
| Opportunities | Threats |
| <ul style="list-style-type: none">• Can be implemented effectively with small project teams• Allows priorities to be modified as new insights emerge• Encourages continuous refinement based on user input• Supports faster alignment with target market expectations | <ul style="list-style-type: none">• Team members may disregard framework principles, affecting progress• High reliance on collaboration and mutual understanding• Possibility of exceeding budget if changes are not controlled |

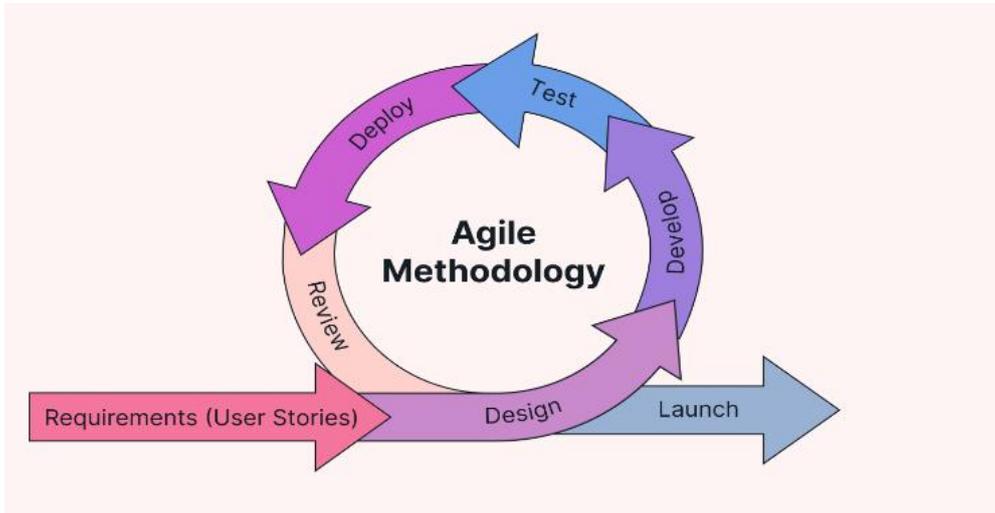


Fig. 1. Agile Methodology

4.1 Stages

First stage: Gathering requirements

During this phase, the team identifies stakeholder expectations, defines system goals, allocates available resources, and develops an initial timeline and budget. A high-level research plan is also prepared to guide subsequent stages.

Second stage: Design

This stage involves creating the technical foundation for the system. It includes planning the system's architecture, determining algorithms and data structures, outlining the user interface, and mapping out how users will interact with each component.

Third stage: Implementation

The team begins writing the system code and integrating the primary modules. Core functionalities are developed and verified to ensure they operate as intended.

Fourth stage: Testing

Multiple testing techniques are performed, such as system testing, integration testing, performance testing, and user acceptance testing. The objective is to ensure system stability, functionality, and readiness for deployment.

Fifth stage: Deployment

At this point, the system is delivered to real users for practical use. Deployment ensures that the solution functions smoothly in the intended environment and aligns with user expectations.

Sixth stage: Review

The completed system is evaluated against predefined performance indicators. Any identified issues are addressed, future risks are anticipated, and necessary adjustments or improvements are documented.

Seventh stage: Launch

This final step marks the official release of the system, making it fully available for the target audience.

4.2 Data Analysis Method

The study utilised questionnaires as the primary data-collection tool, complemented by insights from online journal articles and academic publications. The analysis process involved evaluating questionnaire responses independently, then summarising and synthesising the findings from secondary sources. Data were categorised into themes such as personal opinions, statistical trends, and behavioural patterns to facilitate comparison. Secondary data were further organised based on whether they supported or contradicted the survey outcomes. Combining both data types enabled a more comprehensive interpretation of the overall results.

4.3 Findings

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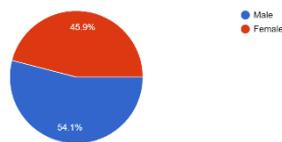


Fig. 2. Gender of the respondents

54.1% of responses were male and 45.9% female

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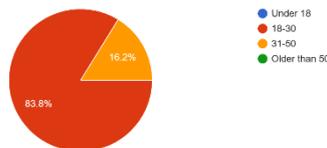


Fig. 3. Age of the respondents

The highest percentage of people between the ages of 18-30 was 31 people. The remaining 6 were between 31-50 years old.

3)

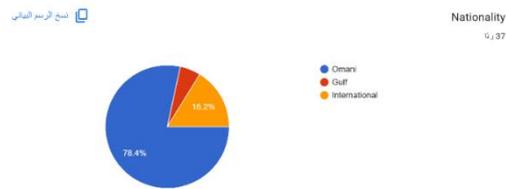


Fig. 4. Nationality of the respondents

The number of Omanis is 29, 2 are Gulf nationals and 6 are international.

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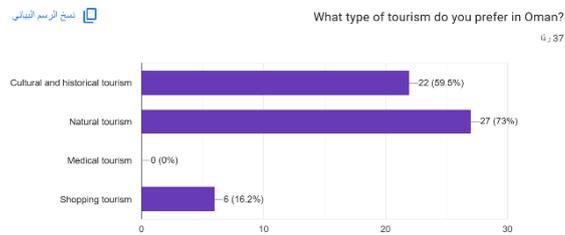


Fig. 5. What type of tourism do you prefer in Oman

The preferred tourism in Oman, according to the questionnaire, is natural tourism, followed by cultural and historical tourism, then shopping tourism.

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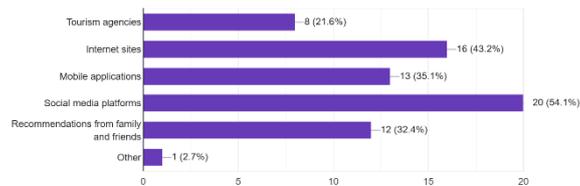


Fig. 6. what tool or resources do you typically use to plan your tourism trips

According to the survey, social media is the most used tool for planning trips, according to the survey, followed by internet sites, mobile applications, then recommendations.

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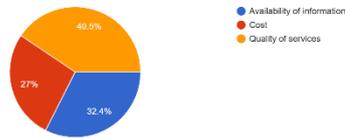


Fig. 7. What is the most important factor when choosing tourist destinations

40.5% care about the quality of services when choosing tourist destinations. 32.4% Availability of information. Then the cost is 27%.

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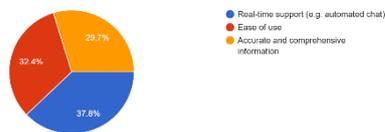


Fig. 8. What features do you look for in a tourism platform

The highest percentage of responses about features was about real-time support at 37.8%, then ease of use, followed by accuracy of information.

8)

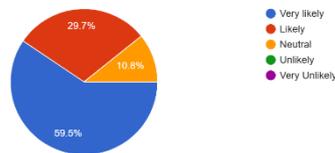


Fig. 9. What do you think about the idea of a chatbot that provides tourist suggestions and information about destinations

The research idea was greatly admired by people.

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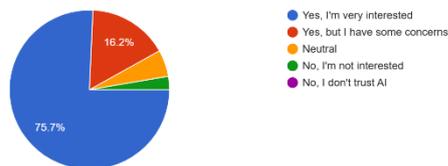


Fig. 10. If Discover Oman launches would you be interested in trying?

A large percentage of people are interested.

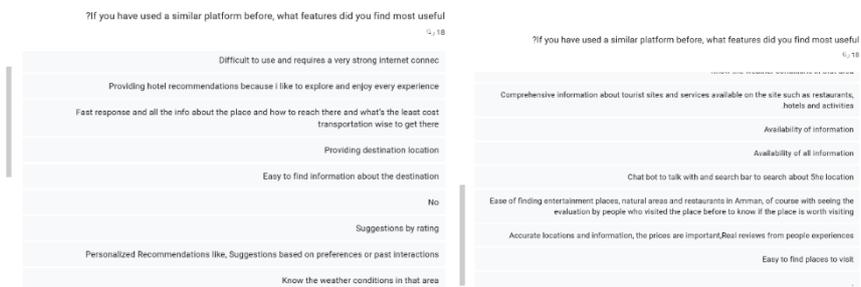


Fig. 11. If you have used a similar platform before, what features did you find most useful

The answers to this question varied, but some answers somewhat touch on the goal of the research and will be available on the website.

5. Results

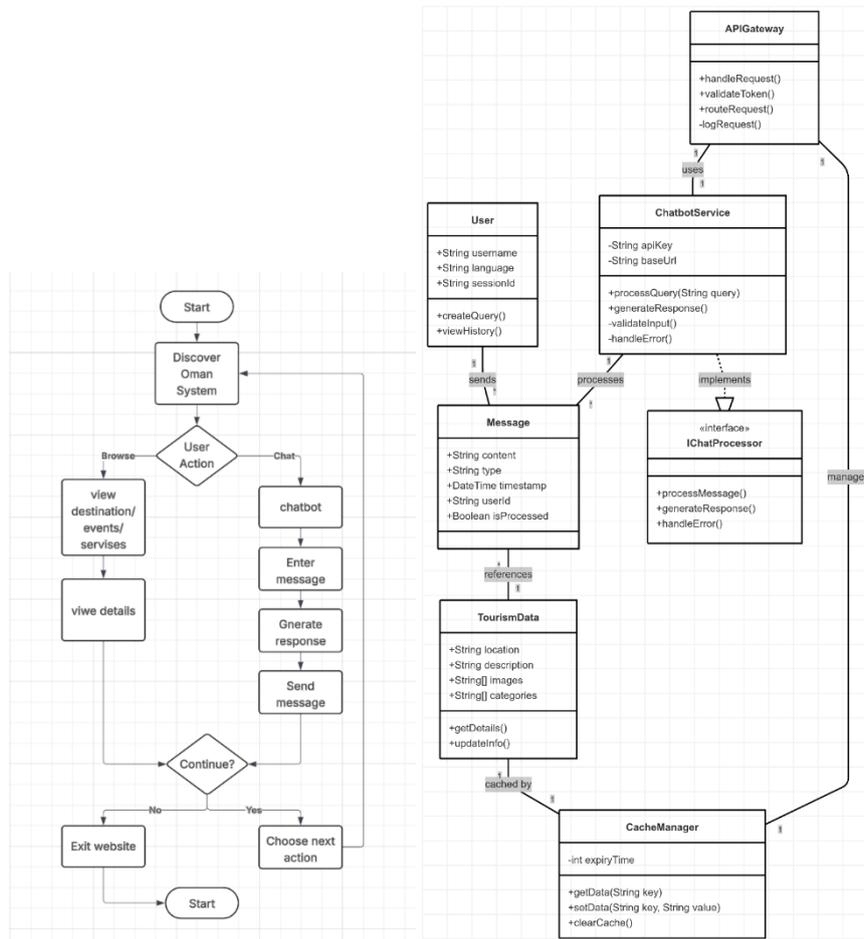


Fig. 12. Flowchart and Class Diagram

The system flowchart illustrates the operational sequence of the Discover Oman platform. Users begin at the start point and then enter the main interface of the system. From there, they may initiate a conversation with the chatbot and submit questions related to tourism. The chatbot processes these queries and responds instantly using integrated AI services.

Users also have the option to navigate through tourism categories such as destinations, services, or events. After completing their activities, users may either return to the homepage to continue exploring or exit the system, marking the end of their interaction. This flow ensures a smooth, user-friendly experience that guides visitors through the platform's features in a clear and efficient manner.

5.1 Key Components

| Class Name | Role |
|-----------------------|--|
| User | Represents the tourist interacting with the system; allows submission of queries and retrieval of past interactions. |
| Message | Handles transmission of user questions and AI-generated responses, including metadata such as timestamps. |
| ChatbotService | Processes incoming queries using the AI model (e.g., DeepSeek), generates appropriate replies, and manages error handling. |
| IChatProcessor | Interface defining the standard operations and processing structure for AI response modules. |
| TourismData | Stores, retrieves, and manages all tourism-related content, including attraction descriptions, services, and event details. |
| CacheManager | Improves system performance by temporarily storing frequently accessed information, reducing delays and minimising unnecessary API requests. |
| APIGateway | Regulates incoming system requests, checks security tokens, routes call to appropriate services, and logs system activities. |

6. Conclusion

The study implements an innovative system to boost the Sultanate of Oman tourism experiences by using AI-powered chatbots. An intelligent platform backed by the proposed system brings dispersed information and real-time access to unfamiliar destinations under a single unified system for tourists. Smart tourism tools demonstrate their ability to give users customized high-efficiency service access which fulfils their needs while supporting national tourism objectives. The system development benefits from agile methodology which enables continuous improvement and user feedback response leading to a platform that remains useful and easy to navigate. Users demonstrate a deep interest in getting real-time support simple interfaces and trustworthy information during their trip planning process. This digital solution helps Oman execute Vision 2040 digital transformation alongside boosting its position as a competitive and smart tourism destination on the global stage.

References

- [1] E. Buhalis and A. Amaranggana, “Smart tourism destinations,” in *Information and Communication Technologies in Tourism 2015*. Cham, Switzerland: Springer, 2015, pp. 553–564. Available: https://doi.org/10.1007/978-3-319-14343-9_28
- [2] U. Gretzel, Z. Xiang, and D. R. Fesenmaier, “Smart tourism: Foundations and developments,” *Electronic Markets*, vol. 25, no. 3, pp. 179–188, 2015. Available: <https://doi.org/10.1007/s12525-015-0196-8>
- [3] R. Pillai and B. Sivathanu, “Adoption of AI-based chatbots for hospitality and tourism,” *International Journal of Contemporary Hospitality Management*, vol. 32, no. 10, pp. 3199–3226, 2020. Available: <https://doi.org/10.1108/IJCHM-04-2020-0259>
- [4] I. P. Tussyadiah, D. Wang, and C. H. Jia, “Virtual reality and artificial intelligence in tourism experience design,” *Tourism Management*, vol. 71, pp. 255–268, 2019. Available: https://doi.org/10.1007/978-3-319-51168-9_17
- [5] A. Følstad and P. B. Brandtzaeg, “Chatbots and the new world of HCI,” *Interactions*, vol. 24, no. 4, pp. 38–42, 2017. Available: <https://doi.org/10.1145/3085558>
- [6] E. Adamopoulou and L. Moussiades, “An overview of chatbot technology,” in *Artificial Intelligence Applications and Innovations*, IFIP AICT, vol. 584. Cham, Switzerland: Springer, 2020, pp. 373–383. Available: https://doi.org/10.1007/978-3-030-49186-4_31
- [7] R. Leung, “From e-tourism to smart tourism: Technologies and applications,” in *Information and Communication Technologies in Tourism 2022*. Cham, Switzerland: Springer, 2022. Available: https://doi.org/10.1007/978-3-030-48652-5_2
- [8] Ministry of Heritage and Tourism, “Tourism development strategy,” Government of Oman, Muscat, Oman. Available: <https://mht.gov.om>
- [9] Oman Vision 2040 Implementation Follow-up Unit, “Oman Vision 2040,” Sultanate of Oman. Available: <https://www.oman2040.om>
- [10] K. Schwaber and J. Sutherland, *The Scrum Guide: The Definitive Guide to Scrum: The Rules of the Game*. Scrum.org, 2020. Available: <https://scrumguides.org>