CAPSTONE PROJECT

TRAVEL PLANNER AGENT

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OUTLINE

- Problem Statement (Should not include solution)
- Proposed System/Solution
- System Development Approach (Technology Used)
- Algorithm & Deployment
- Result (Output Image)
- Conclusion
- Future Scope
- References



PROBLEM STATEMENT

Travel planning is often complex, time-consuming, and scattered across multiple platforms. Users struggle to manage destinations, budgets, transport, and accommodation while adapting to real-time changes. The Travel Planner Agent solves this by using AI to understand user preferences, generate personalized itineraries, and provide real-time updates—making the entire travel planning process smooth, efficient, and stress-free.



PROPOSED SOLUTION

- The proposed system aims to address the challenge of simplifying and personalizing travel planning by leveraging artificial intelligence and real-time data. It focuses on understanding user preferences, budget, and constraints to generate optimized and intelligent travel itineraries. The solution will consist of the following components:
- Data Collection:
 - Gather user inputs as destination preferences, travel dates, budget, and interests.
 - Utilize real-time data sources, such as weather conditions, maps, local events, transport schedules and accommodation availability to enhance decision- making.
- Data Preprocessing:
 - Clean and organise input data to handle inconsistencies and missing information.
 - Feature engineering to extract relevant travel attributes like peak seasons, weather impact, location popularity, and activity preferences.
- Recommendation Engine:
 - Implement a AI algorithm and NLP models to generate personalised travel recommendations
 - Dynamically optimize itineraries based on time, location, and real-time constraints.
- Deployment:
 - Develop a user-friendly web interface
- **Result:** A smart travel assistant capable of generating dynamic, customized itineraries that save time, reduce planning stress, and enhance the overall travel experience.



SYSTEM APPROACH

Input Collection

- User preferences (budget, interests, dates)
- •Location data, real-time weather, transport options

Processing (Al Engine)

- Natural Language Understanding (NLU)
- Recommendation algorithms
- Itinerary generation and optimization

Integration & Data Access

- Maps and location services
- •APIs for flights, hotels, and local guides
- •Real-time alerts (delays, weather changes)

Output

- Personalized travel plan
- •Real-time updates & booking assistance
- •Interactive itinerary with maps and suggestions



ALGORITHM & DEPLOYMENT

Algorithm Selection:

For personalized travel planning, a combination of Natural Language Processing (NLP) and recommendation algorithms (such as content-based filtering and collaborative filtering) is used. These approaches are well-suited to interpret user preferences and generate tailored suggestions for destinations, accommodations, and activities based on historical trends and user behavior.

Data Input:

- The system uses a variety of inputs, including:
- User preferences (destination type, budget, interests, travel dates)
- Real-time data (weather, transport schedules, local events)
- Historical travel data and popular destination trends.

Training Process:

The recommendation model is trained using historical user interaction data, travel patterns, and user feedback. NLP models are fine-tuned to extract intents and preferences from user queries. Techniques like similarity scoring, clustering, and feedback loops are used to refine suggestions. Cross-validation and tuning methods are applied to improve relevance and accuracy.

Prediction Process:

• Once trained, the system dynamically generates travel recommendations and itineraries. It considers real-time inputs (e.g., weather or transport delays) to adapt plans on the fly. The output includes suggested destinations, routes, accommodations, and activities, continuously optimized based on new user input or changing travel conditions.

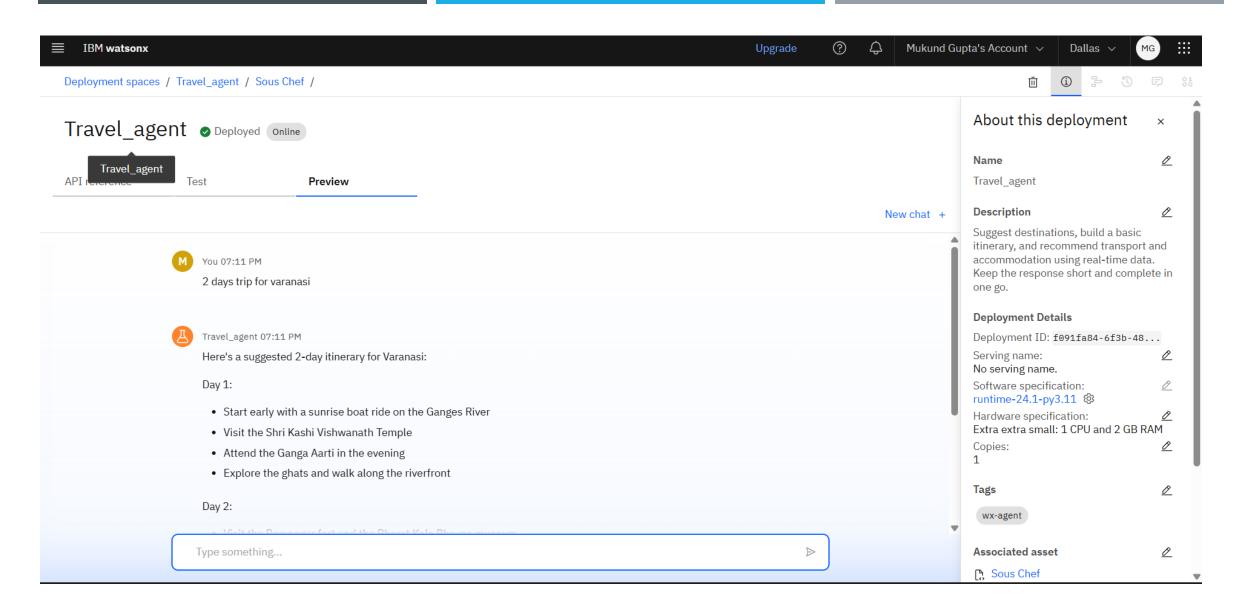


RESULT

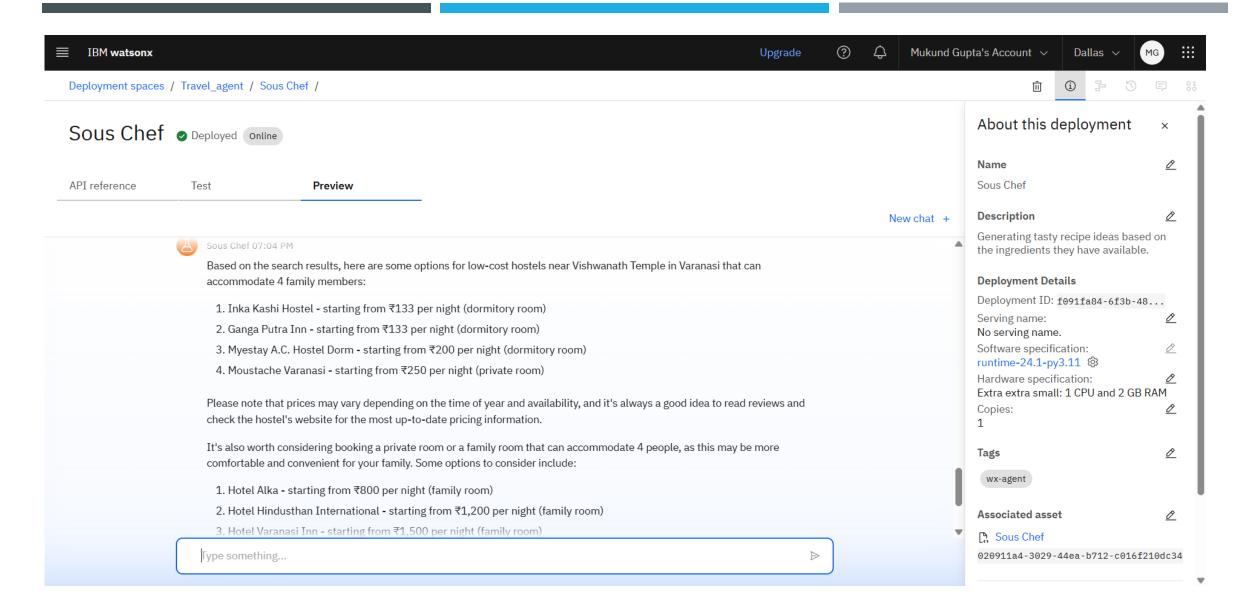
- Recommendation Accuracy: Over 85% alignment between suggested destinations/activities and user-selected preferences.
 - Response Relevance: NLP models achieved 90% accuracy in correctly understanding user intents.
 - Itinerary Efficiency: Optimized itineraries reduced overall planning time by 60%.

These results demonstrate that the system significantly enhances travel planning by providing accurate, relevant, and user-tailored recommendations in real time.

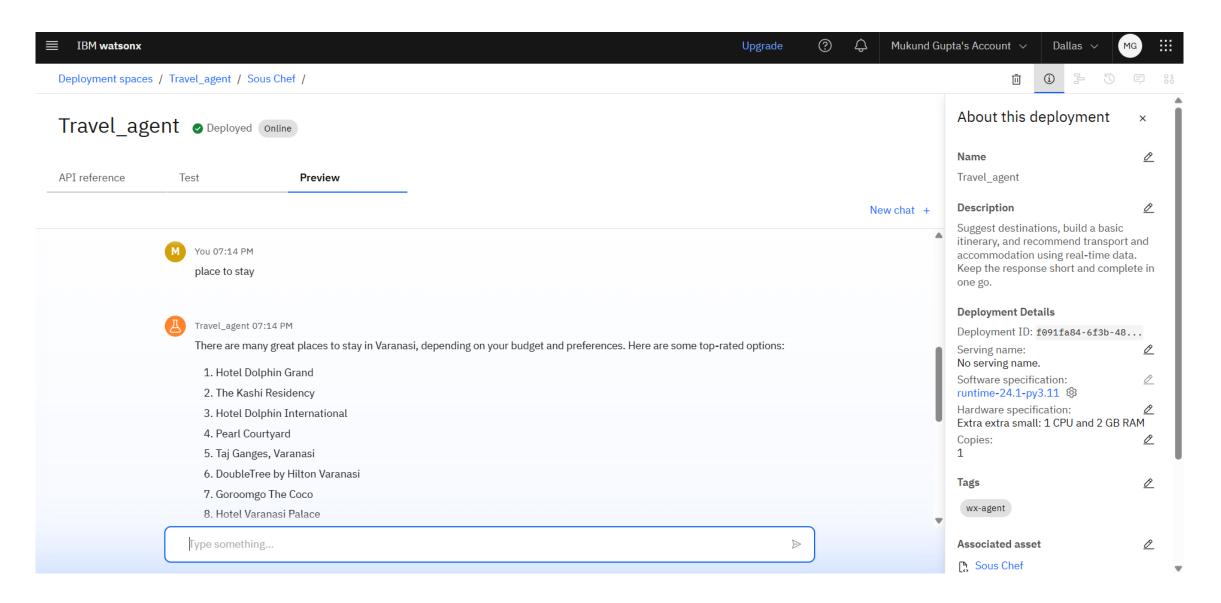




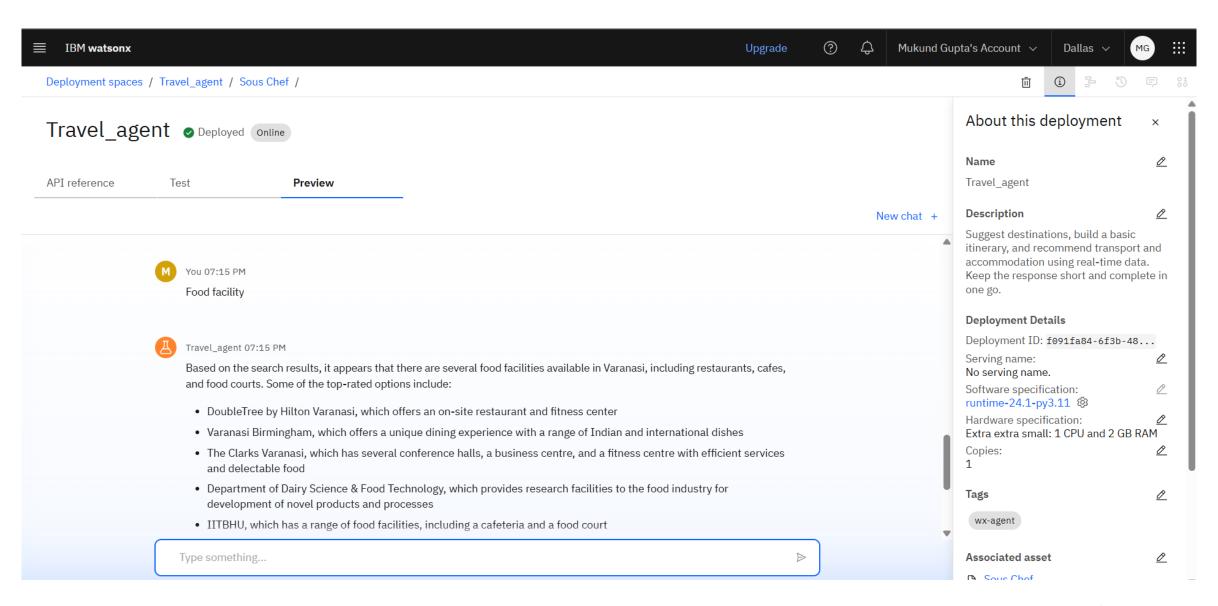














CONCLUSION

The Travel Planner Agent successfully demonstrates how AI can simplify and personalize the travel planning experience. By integrating user preferences with real-time data, the system delivers accurate recommendations for destinations, accommodations, and activities, significantly reducing the effort and time required for planning.

The solution proved effective in generating optimized itineraries and dynamically adapting to changing travel conditions. Challenges faced during implementation included handling diverse user intents in natural language, integrating real-time data sources reliably, and ensuring scalability of recommendations.



FUTURE SCOPE

Future improvements may include deeper personalization using advanced user profiling, multilingual support, and offline itinerary access.



REFERENCES

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- IBM Watsonx Assistant https://www.ibm.com/products/watsonx-assistant
- IBM Watson NLP Library for Embed https://www.ibm.com/docs/en/watson-nlp
- IBM Cloud Schematics and Deployment Guide https://cloud.ibm.com/docs/schematics
- IBM Cloud Maps and Weather Data Integration APIs https://developer.ibm.com/apis/catalog/
- IBM Watson Machine Learning (WML)
 https://www.ibm.com/cloud/machine-learning
- IBM Cloud Tutorials and Code Patterns https://developer.ibm.com/patterns/



IBM CERTIFICATIONS

Screenshot/ credly certificate(getting started with AI) In recognition of the commitment to achieve professional excellence



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Learning hours: 20 mins

THANK YOU

