

## **Altinerary: Intelligent Travel Itinerary Generation**

### **Abstract**

Altinerary is an innovative travel planning platform that leverages artificial intelligence to revolutionize the way users create personalized travel itineraries. The system combines advanced natural language processing, ChatGPT integration, and Unsplash APIs to understand user preferences and generate comprehensive travel plans with pictures. This document provides an overview of the architecture, key features, and underlying technologies that power Altinerary, showcasing its capabilities in delivering seamless and tailored travel experiences.

### **Architecture**

The architecture of Altinerary is designed to seamlessly integrate various components, providing users with an intelligent and interactive travel itinerary generation experience. Users interact with the system through a user interface built using React and Vite, hosted on an AWS EC2 instance (t2.micro) accessible at <http://aitinerary.net>. The front end collects essential inputs such as the source city, destination city, travel duration, and mode of transport.

### **Front End:**

React and Vite: A modern front-end framework (Vite) and library (React) are employed to create a responsive and user-friendly interface. Users input their travel preferences through this interface.

### **Back End:**

The back end is powered by serverless AWS Lambda functions, orchestrating the core functionalities of Altinerary.

**ChatGPT Integration (1st Lambda):** User inputs trigger the natural language processing engine, which communicates with ChatGPT (gpt-3.5-turbo). This integration enables intelligent conversations with the system, allowing users to refine and tailor their travel plans dynamically. When user provide details such as source city, destination city, travel duration, and mode of transport through the front-end interface we are concatenating into a strings calling the Lambda function.

Below is an image of the response from the Postman:

```

POST https://86e1oq25dh.execute-api.us-east-2.amazonaws.com/default/GPT
Body (8) Headers (8) Params Authorization Pre-request Script Tests Settings Cookies Beautify
1 {
2   "prompt": "{\"Give me an itinerary for 3 days from Milwaukee to New York by car\"}"
3 }

Body Cookies Headers (8) Test Results
Pretty Raw Preview Visualize JSON Status: 200 OK Time: 11.17 s Size: 2.21 KB Save as example ...
1 {
2   "response": "Day 1:\n- Start early in the morning from Milwaukee, Wisconsin.\n- Drive east on I-94 towards Chicago, Illinois. Enjoy the scenic route and make stops at any interesting sights along the way.\n- Arrive in Chicago and spend the day exploring the city. Visit tourist attractions like Millennium Park, Navy Pier, and the Art Institute of Chicago.\n- In the evening, find a nice restaurant for dinner and enjoy the vibrant nightlife in Chicago.\n- Stay overnight in Chicago.\n\nDay 2:\n- Depart from Chicago in the morning and continue driving east on I-90.\n- Enjoy the picturesque drive as you pass through Indiana, Ohio, and Pennsylvania.\n- Make stops along the way to stretch your legs and grab snacks.\n- As you approach New York state, consider visiting Niagara Falls and spend some time marveling at the natural wonder.\n- Continue driving east and reach a city like Buffalo, Syracuse, or Rochester to stop for the night.\n- Find accommodation and explore the local area, discovering any available attractions or restaurants.\n\nDay 3:\n- Resume your journey in the morning, driving east towards New York City.\n- Depending on the time and your interests, you may want to stop at some notable locations such as Albany or Hudson Valley.\n- As you approach the New York City area, be prepared for increased traffic.\n- Once in New York City, find parking near one of the main boroughs or Manhattan.\n- Spend the day exploring the city's iconic landmarks, such as Times Square, Central Park, the Statue of Liberty, Empire State Building, and the Metropolitan Museum of Art.\n- In the evening, enjoy a delicious dinner at one of the many renowned restaurants in the city.\n- Stay overnight in New York City.\n\nThis itinerary provides a general idea for your road trip from Milwaukee to New York City. Feel free to adjust it based on your personal interests, preferred attractions, and time constraints."
3 }

```

**Place Extraction (2nd Lambda):** To accurately extract major places from the conversational responses, a second Lambda function utilizes ChatGPT (gpt-4-1106-preview). This approach ensures precise place names, especially in complex sentence structures, enhancing the accuracy of the extracted locations.

When a response is captured from the 1st lambda function we pass it to 2nd lambda function where places are extracted.

Below is an image of the response from the Postman:

```

POST https://5pgwecpbji.execute-api.us-east-2.amazonaws.com/default/chatgpt_place_extractor
Body (5) Headers (9) Params Authorization Cookies
Pretty Raw Preview Visualize Text ...
1 {
2   "response": "Day 1:\n- Start early in the morning from Milwaukee, Wisconsin.\n- Drive east on I-94 towards Chicago, Illinois. Enjoy the scenic route and make stops at any interesting sights along the way.\n- Arrive in Chicago and spend the day exploring the city. Visit tourist attractions like Millennium Park, Navy Pier, and the Art Institute of Chicago.\n- In the evening, find a nice restaurant for dinner and enjoy the vibrant nightlife in Chicago.\n- Stay overnight in Chicago.\n\nDay 2:\n- Depart from Chicago in the morning and continue driving east on I-90.\n- Enjoy the picturesque drive as you pass through Indiana, Ohio, and Pennsylvania.\n- Make stops along the way to stretch your legs and grab snacks.\n- As you approach New York state, consider visiting Niagara Falls and spend some time marveling at the natural wonder.\n- Continue driving east and reach a city like Buffalo, Syracuse, or Rochester to stop for the night.\n- Find accommodation and explore the local area, discovering any available attractions or restaurants.\n\nDay 3:\n- Resume your journey in the morning, driving east towards New York City.\n- Depending on the time and your interests, you may want to stop at some notable locations such as Albany or Hudson Valley.\n- As you approach the New York City area, be prepared for increased traffic.\n- Once in New York City, find parking near one of the main boroughs or Manhattan.\n- Spend the day exploring the city's iconic landmarks, such as Times Square, Central Park, the Statue of Liberty, Empire State Building, and the Metropolitan Museum of Art.\n- In the evening, enjoy a delicious dinner at one of the many renowned restaurants in the city.\n- Stay overnight in New York City.\n\nThis itinerary provides a general idea for your road trip from Milwaukee to New York City. Feel free to adjust it based on your personal interests, preferred attractions, and time constraints."
1 {"chatgpt_extract_response": "- Milwaukee, Wisconsin\n- Chicago, Illinois\n- Millennium Park\n- Navy Pier\n- Art Institute of Chicago\n- Indiana\n- Ohio\n- Pennsylvania\n- Niagara Falls\n- Buffalo\n- Syracuse\n- Rochester\n- Albany\n- Hudson Valley\n- New York City\n- Times Square\n- Central Park\n- Statue of Liberty\n- Empire State Building\n- Metropolitan Museum of Art"}

```

**Unsplash API Integration (3rd Lambda):** Upon extracting major places, the system integrates with the Unsplash API to fetch relevant images associated with each location. This enriches the user experience by providing visual previews of the recommended destinations. So this api is called iteratively on all the places received from the 2nd Lambda function.

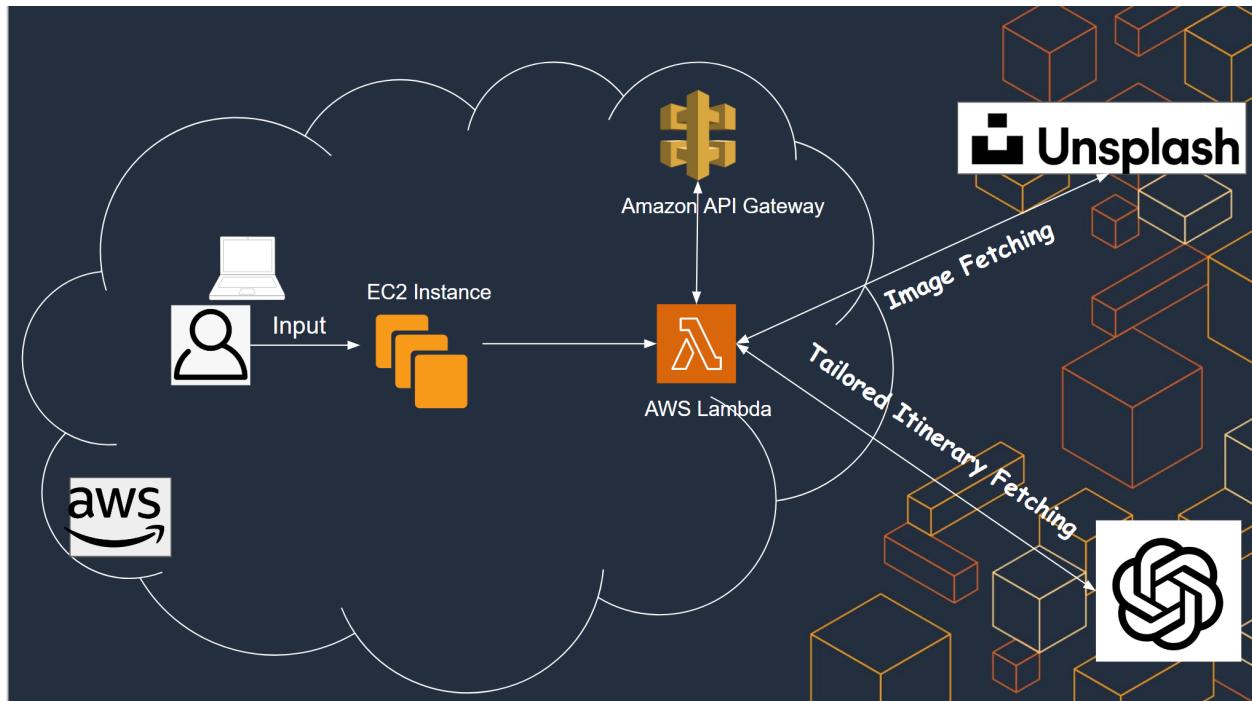
Below is an image of the response from the Postman:

The screenshot shows a Postman request configuration and its response. The request is a GET to <https://r970e3mv7l.execute-api.us-east-2.amazonaws.com/default/unsplash?place=Statue%20of%20Liberty>. The 'Query Params' table has one entry: 'place' with value 'Statue of Liberty'. The response body is a JSON object with a single key 'response':

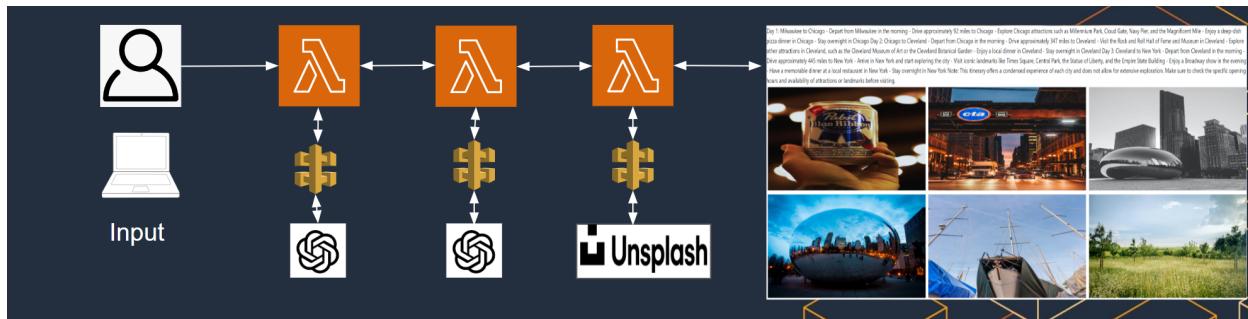
```
1 {"response": "https://images.unsplash.com/photo-1445023086979-7244a12345a8?crop=entropy&cs=tinysrgb&fit=max&fm=jpg&ixid=M3w1NDM0NDI8MHwxfHJhbmxXx8fHx8fHx8fDE3MDMzMzExMjd8&ixlib=rb-4.0.3&q=80&w=1080"}
```

The response status is 200 OK, time is 1148 ms, size is 378 B, and it was saved as an example.

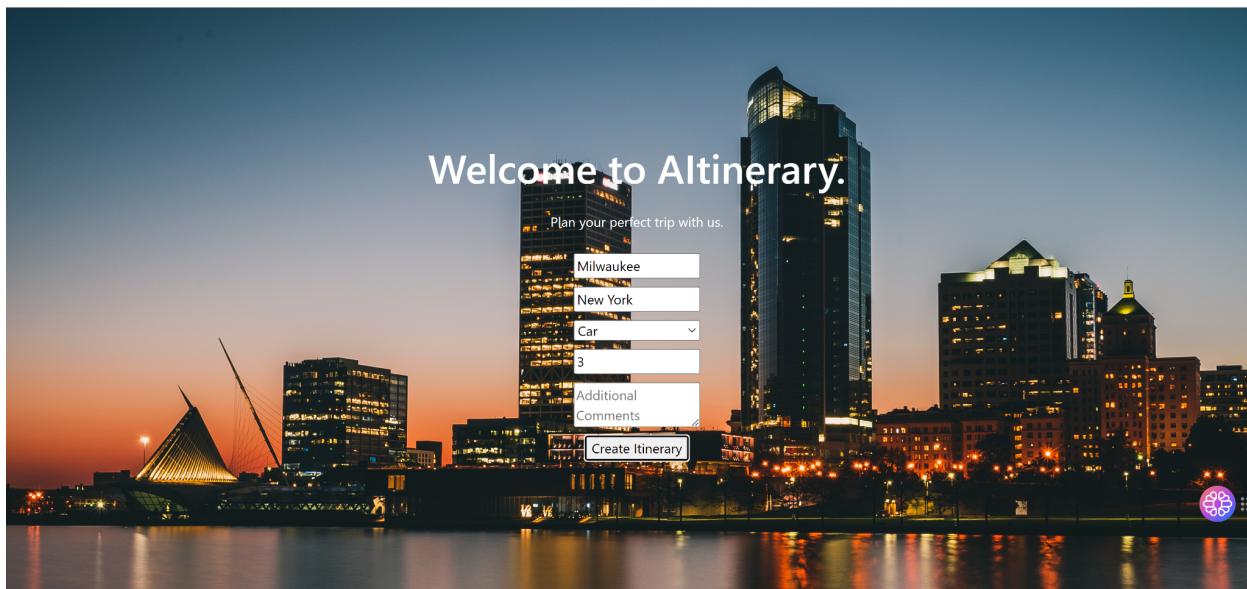
### Architecture Diagram:



## **Interaction Flow:**



**User Input:** Users provide details such as source city, destination city, travel duration, and mode of transport through the front-end interface.



**ChatGPT Integration (1st Lambda):** The first Lambda function triggers the natural language processing engine, initiating a dynamic conversation with ChatGPT. The generated conversation is sent back to ChatGPT to refine and finalize the user's travel itinerary.

**Place Extraction (2nd Lambda):** The extracted major places from the refined conversation are obtained using another Lambda function, leveraging ChatGPT for accurate place identification within complex sentence structures.

**Unsplash API Integration (3rd Lambda):** The final set of major places is used to query the Unsplash API, fetching relevant images associated with each destination.

**Presentation to User:** The fully generated itinerary, enriched with images, is presented to the user through the front-end interface, closing the loop of interaction.

Day 1: Milwaukee to Chicago - Depart from Milwaukee in the morning - Drive approximately 92 miles to Chicago - Explore Chicago attractions such as Millennium Park, Cloud Gate, Navy Pier, and the Magnificent Mile - Enjoy a deep-dish pizza dinner in Chicago - Stay overnight in Chicago Day 2: Chicago to Cleveland - Depart from Chicago in the morning - Drive approximately 347 miles to Cleveland - Visit the Rock and Roll Hall of Fame and Museum in Cleveland - Explore other attractions in Cleveland, such as the Cleveland Museum of Art or the Cleveland Botanical Garden - Enjoy a local dinner in Cleveland - Stay overnight in Cleveland Day 3: Cleveland to New York - Depart from Cleveland in the morning - Drive approximately 445 miles to New York - Arrive in New York and start exploring the city - Visit iconic landmarks like Times Square, Central Park, the Statue of Liberty, and the Empire State Building - Enjoy a Broadway show in the evening - Have a memorable dinner at a local restaurant in New York - Stay overnight in New York Note: This itinerary offers a condensed experience of each city and does not allow for extensive exploration. Make sure to check the specific opening hours and availability of attractions or landmarks before visiting.



### **Try it Yourself**

The below is the link for the github where the code is present along with instructions to implement and try in your own AWS Accounts.

<https://github.com/amoghamanju/Altinerary>

### **Additional Enhancements**

- Booking links: Travel, Hotels, etc
- Budget Limit parameter
- Map Integration
- Weather based recommendation