ExploreCAN

Creating a Recommendation System for Canadian Restaurants

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Project Overview

Despite the many attractions and restaurants available in Canada, there is a lack of a centralized and personalized recommendation system to help new visitors discover interesting places to eat or visit. This results in a frustrating and time-consuming search process for users who are often overwhelmed by the abundance of options available. A new recommendation system is needed to address this problem and provide a more seamless and enjoyable experience for visitors to Canada

The goal of the project is to create a recommendation system for Canadian restaurants or tourist attractions. The system is intended to provide personalized recommendations to users based on their interests and preferences, helping them to discover the best places to eat or visit in Canada. The project involves several phases, including requirements gathering, system design, development, optimization, marketing, and ongoing maintenance and support.



Goals and Objectives:

Objectives:

- To create a personalized recommendation system for Canadian restaurants or tourist attractions.
- To help users discover new and interesting places to eat or visit in Canada.
- To provide a user-friendly and intuitive interface for the recommendation system.
- To implement measures to handle peak traffic and ensure system availability.
- To gather user feedback and implement improvements to the system over time.
- To promote the system and generate interest among potential users.
- To complete the project within the given timeframe and budget.

Objectives:

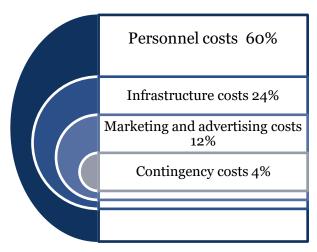
- To conduct requirements gathering and analysis to determine user needs and preferences.
- To design a database schema and system architecture that supports the recommendation system.
- To develop a backend system that can handle user requests and provide personalized recommendations.
- To design a frontend interface that is easy to use and navigate.
- To integrate the backend and frontend systems and perform comprehensive testing to ensure system functionality.
- To optimize the system to handle peak traffic and ensure system availability.
- To implement a feedback mechanism to gather user feedback and implement improvements to the system.
- To develop a marketing plan to promote the system to potential users.
- To launch the system and monitor user feedback and system performance.
- To provide ongoing maintenance and support for the system to ensure its long-term viability.

Business Model:

Revenue Streams: We present two possible revenue streams for the system, providing potential avenues for revenue generation.

- **Commission-based revenue model** where the system earns a commission from restaurant and attraction owners for each user that visits their location based on the system's recommendation
- Advertising-based revenue model where the system earns revenue by displaying targeted ads to users based on their interests and location

Cost Estimations and Distribution:



- Personnel costs including salaries, benefits, and taxes for the project team, estimated at \$500,000
- 2. **Infrastructure costs** including cloud hosting, database licensing, and other technology expenses, estimated at \$200,000
- 3. **Marketing and advertising costs** including online and offline advertising campaigns, estimated at \$100,000
- 4. **Contingency costs** to cover unforeseen expenses and project risks, estimated at \$50,000

Key Stakeholders:

- Users visitors to Canada who are looking for personalized recommendations on restaurants or tourist attractions
- Restaurant and attraction owners businesses that benefit from increased exposure and foot traffic generated by the recommendation system
- Advertising partners businesses that want to advertise their products or services to the recommendation system's user base
- Project team the group of developers, designers, and project managers responsible for creating and maintaining the recommendation system

Key steps in the project:

Data Exploration Data Preprocessing • The first step is to collect and • The next step is to explore the data to preprocess the data, which involves cleaning and structuring the data in a gain insights into the characteristics of the dataset, including statistical way that can be used by the measures, distribution, and patterns recommendation algorithm. **Feature Engineering Model Selection** • Feature engineering involves • Once the data is preprocessed and the selecting the relevant features from relevant features are engineered, the the dataset and transforming them next step is to select a suitable into a format that can be used by the machine learning model for the recommendation algorithm recommendation system Training the Model **API Integration** • This involves splitting the data into · After the model is trained and tuned, training and testing datasets and using the training dataset to train the an API needs to be developed to integrate the recommendation model system with other applications **UI Development** Deployment • Once the API is developed, a user • Once the model, API, and UI are interface (UI) needs to be developed developed, they need to be deployed to enable users to interact with the in the production environment. This recommendation system. This involves integrating the model with involves designing and implementing the UI components, such as forms, the API and UI, and ensuring that the system is scalable and reliable buttons, and visualizations **Monitoring** •This involves tracking user engagement, feedback, and satisfaction, as well as monitoring the system for errors and issues that need to be addressed.

API Integration

To provide users with relevant recommendations, we will be integrating the system with various APIs to gather data about Canadian restaurants and tourist attractions. The following are the steps involved in API integration:

Identifying the required APIs

•The first step is to identify the APIs that we need to integrate with. We plan to use APIs like Yelp, Google Places, and TripAdvisor to gather information about restaurants and tourist attractions.

Authenticating APIs

•After identifying the APIs, we will be authenticating them to access their data. This involves obtaining API keys or tokens and configuring the API authentication setting

Fetching data

•Once the APIs are authenticated, we will fetch data about restaurants and tourist attractions using API endpoints. This data include restaurant or attraction name, location, ratings, reviews, and other relevant information

Data cleaning and preprocessing

•After fetching the data, we will clean and preprocess it to remove any inconsistencies and errors. This involves techniques like data deduplication, data normalization, and data transformation

Storing data

•we will be store the cleaned and preprocessed data in a database for easy retrieval and use.

UI Development

To ensure that the recommendation system is user-friendly and easy to use, we need to develop an intuitive user interface. We will follow below steps in UI design and development

Wireframing

•The first step we will create wireframes or mockups of the user interface. This involves sketching out the basic layout and design of the UI and identifying the different components and elements that need to be included

Designing UI elements

•we will then design the UI elements like buttons, menus, forms, and other interactive elements. This can involve using design software like Adobe hotoshop or Sketch

Front-end development

•After designing the UI elements, we will develop the frontend of the UI using web development technologies like HTML, CSS, and JavaScript. This involves creating web pages and integrating the UI elements into them

Back-end development

•we will develop the back-end of the UI, which involves integrating the API data into the UI and providing the necessary functionality for users to search for and select restaurants or tourist attractions

Planned UI Design:

ExploreCan

A place where you can find what you search for!!!



Current challenges and planned solutions for API integration

Here are some potential challenges for API integration we faced or foresee:

	Challenges Faced	Planned solutions
API	The APIs used for retrieving data	We intent to use middleware tools
Compatibility	about Canadian restaurants or	like API gateway or data
_	tourist attractions were not be	transformation tools to integrate the
	compatible with each other, making	different APIs into a consistent
	it difficult to combine data from	format
	multiple sources into a single	
	recommendation engine	
Authentication	Authorization protocols for user	Use industry-standard security
and	access to the APIs are challenging,	protocols like OAuth or JWT to
Authorization	particularly if the APIs are owned by	ensure secure authentication and
	different vendors or organizations	authorization protocols for user
	_	access to the APIs.
Scalability	As the recommendation system	Use load testing tools to measure the
	grows in popularity, the API	performance of the APIs and plan for
	performance may become a	scaling up the infrastructure as
	bottleneck, particularly if the APIs	necessary to handle increased traffic
	are not designed to handle large	
	volumes of requests	
Error Handling	Errors can occur during API	We planned to use monitoring and
	integration, such as connection	logging tools to capture and track
	failures or response timeouts, which	errors during API integration, and
	must be properly handled to ensure	set up automated alerting and
	that the recommendation system	recovery mechanisms to ensure the
	remains stable and functional	recommendation system remains
		stable and functional

The team is also working to implement measures to handle peak traffic, such as load testing and optimization, and to implement a feedback mechanism to gather user feedback and improve the system. The team is also focusing on creating a user-friendly interface that is easy to use and navigate, which will be crucial to the success of the system.

Conclusion

In conclusion, the project is progressing well. The data cleaning, pre-processing, and feature extraction phases have been completed, and we are currently in the recommendation generation and user interface design stages. The team has successfully integrated APIs and developed a user-friendly interface for seamless interaction between the recommendation engine and the end-user.

Although we encountered some challenges during the project, we were able to overcome them through careful planning, collaboration with API providers, and the use of middleware tools and data transformation techniques.

Moving forward, we will continue to monitor and optimize the performance of the recommendation engine, as well as solicit feedback from users to ensure that the system is meeting their needs and expectations. Overall, we are confident that the project will provide a valuable resource for tourists and newcomers to Canada who are looking for personalized recommendations for restaurants and tourist attractions.

"Discover the Best of Canada with Personalized Recommendations"