MICHIGAN STATE
U N I V E R S I T Y

Project Plan Presentation
Predicting Automotive Sales Using Generative AI

The Capstone Experience

Team Urban Science

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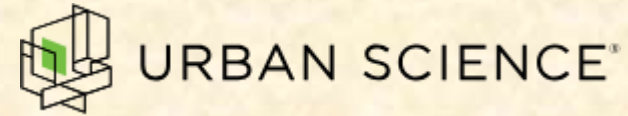
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From Students…
…to Professionals

Project Sponsor Overview

URBAN SCIENCE

- Founded in 1977 by Jim Anderson, now has over 850 employees in more than 20 offices

- Automotive Business Scientists

- Conduct data-driven analysis to increase market share and profitability for dealerships and manufacturers globally

- Business model revolves around four scientific disciplines called "The Power of 4"

(People X Process X Data X Technology)^{Science}

Project Functional Specifications

- The web application will analyze data and display insights on an easy-to-read dashboard with interactive visualizations.

- Uses time-series forecasting to make predictions on end of the month sale and repair order volumes.

- Uses the power of Generative AI to provide actionable suggestions based on a user's question.
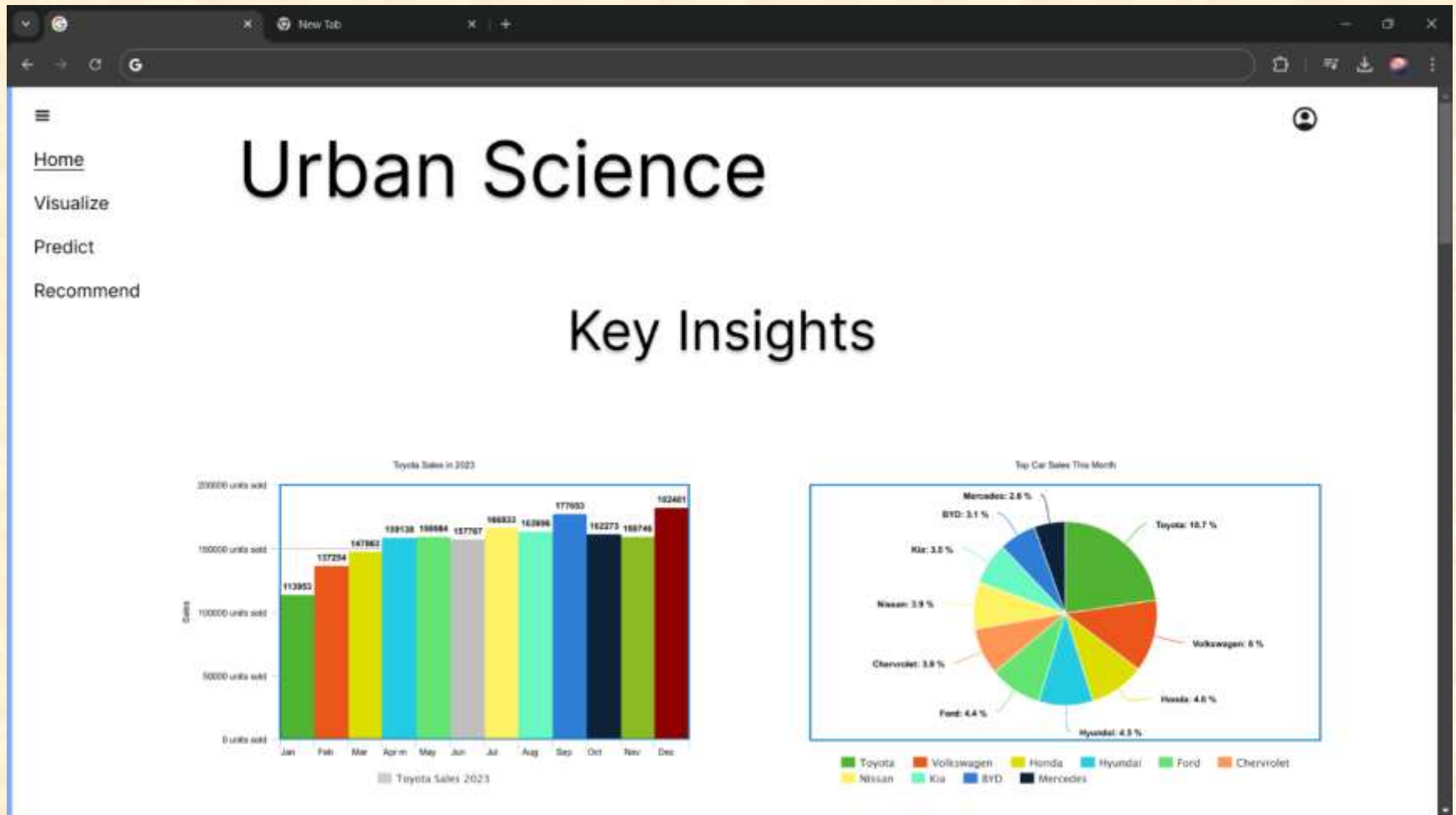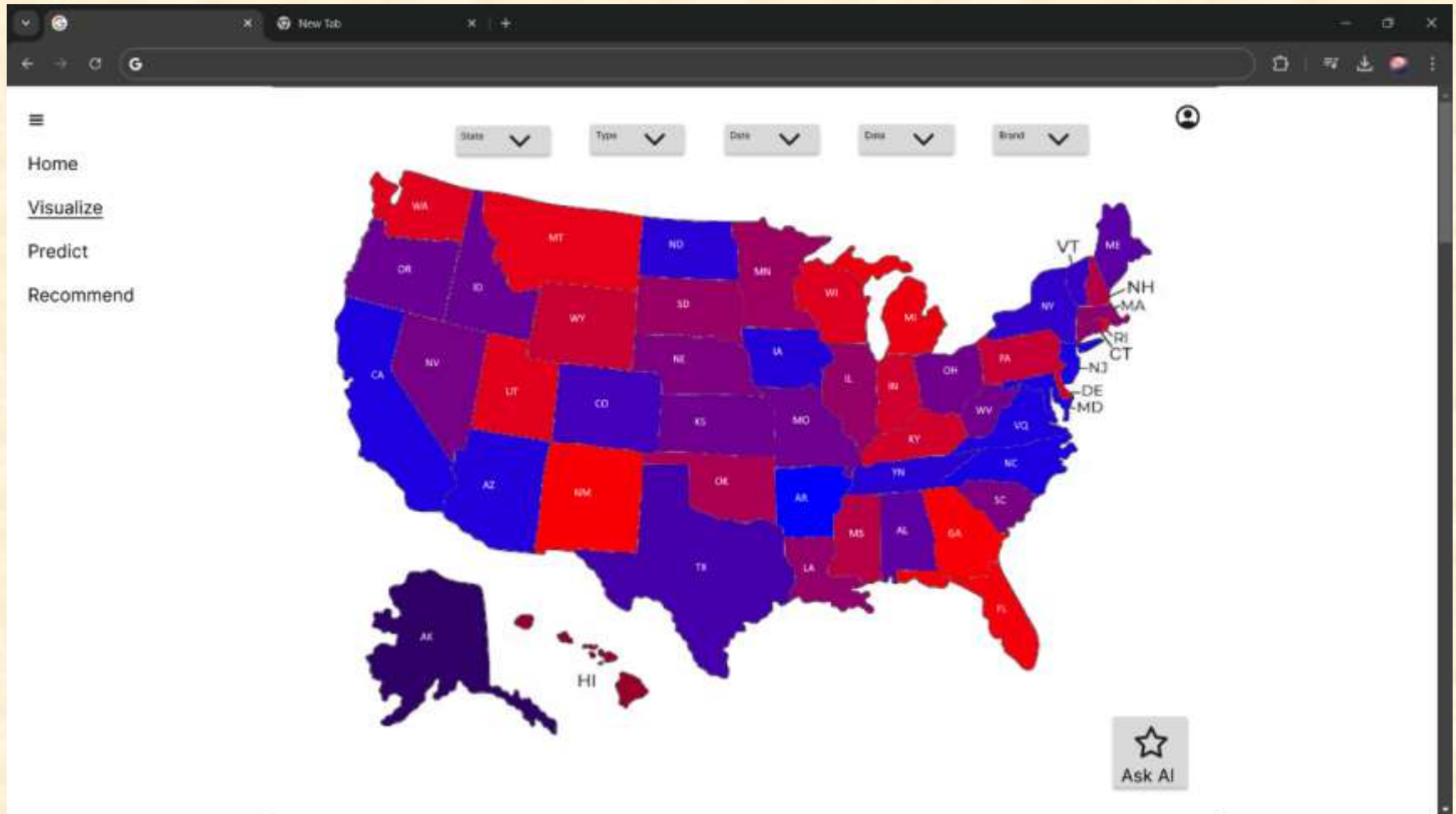
Project Design Specifications

- Multiple charts are used to display sales trends and volumes

- A chatbot that provides users with insights about the data

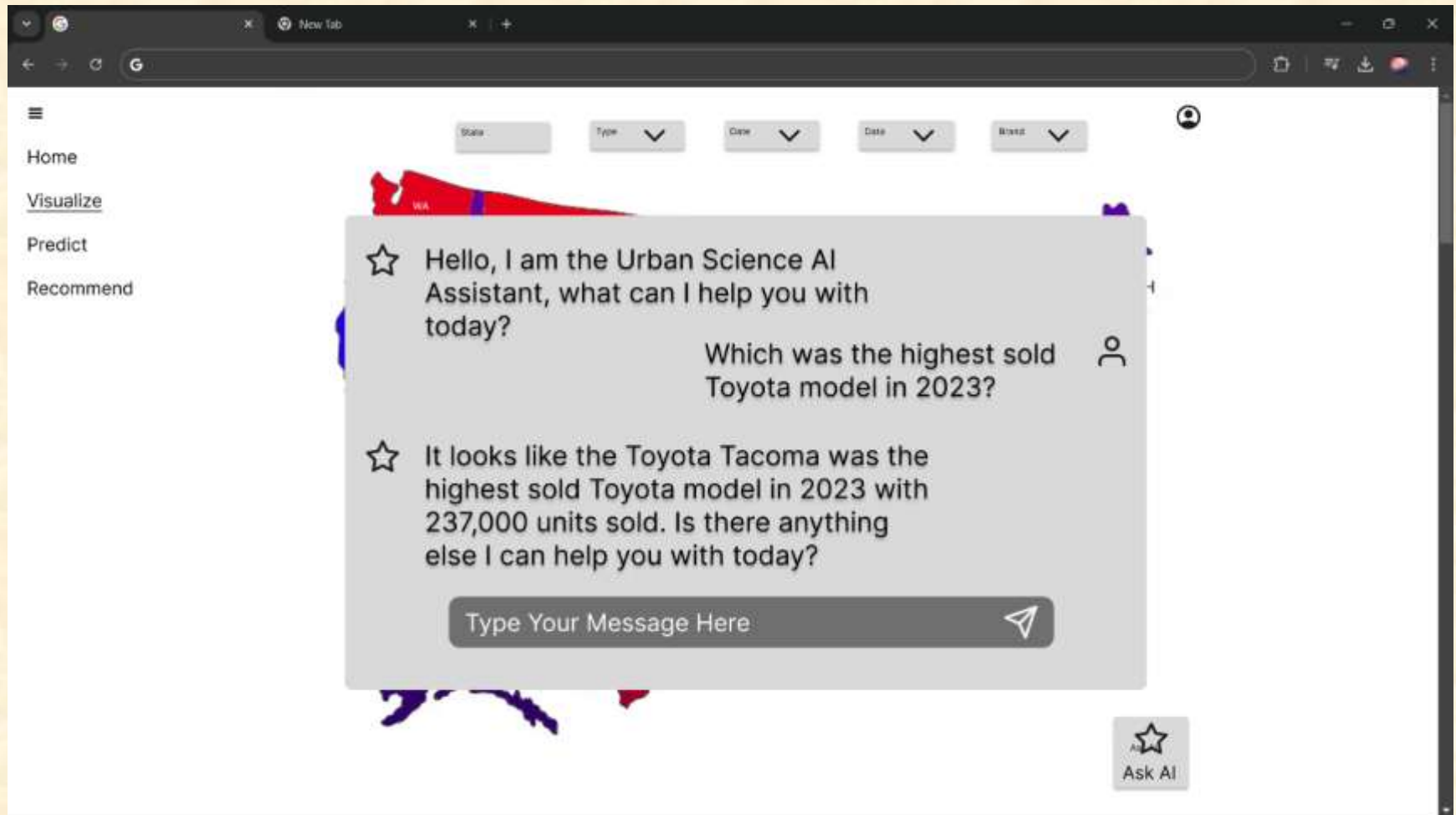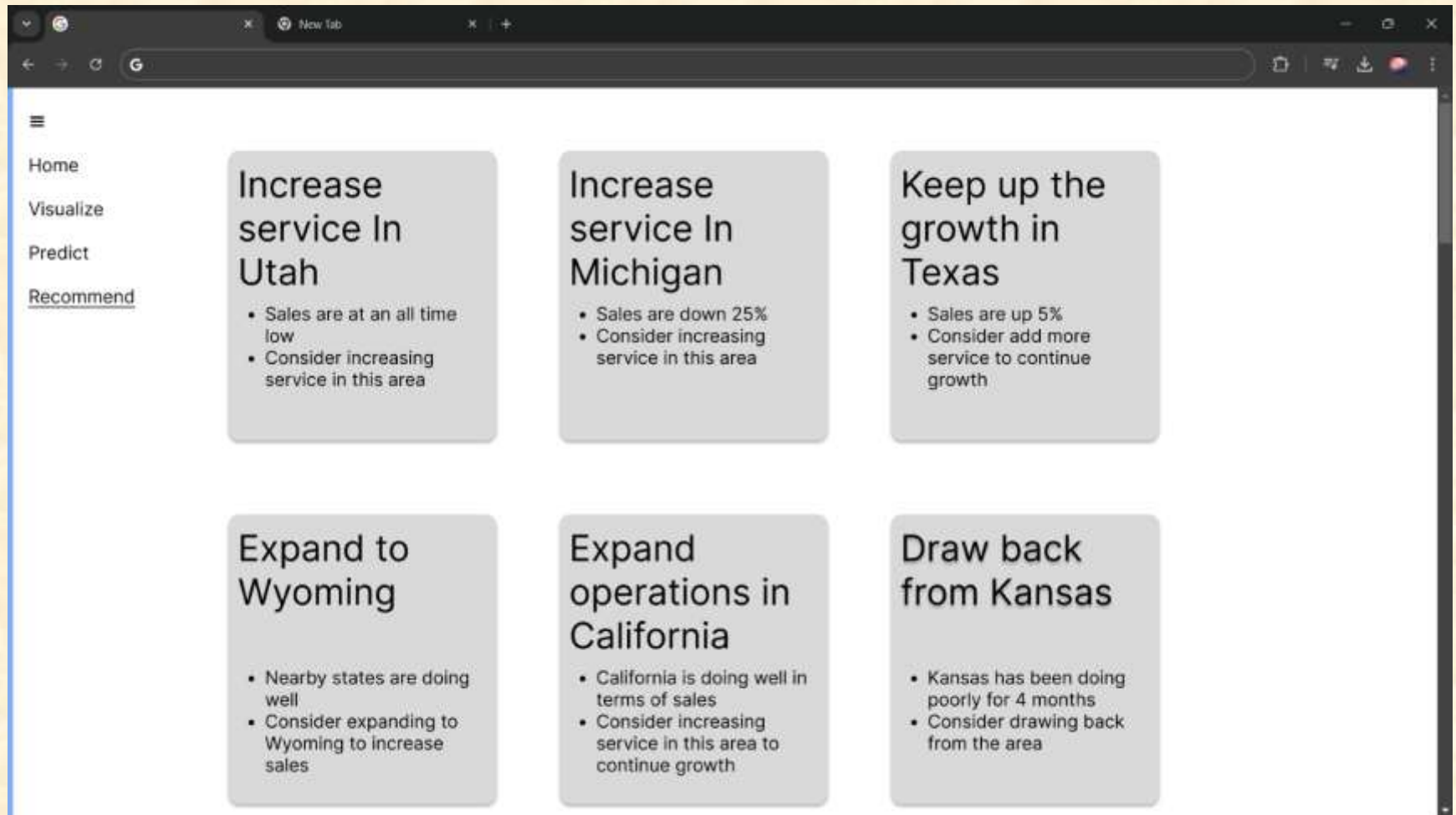- Design an intuitive, user-friendly interface

Screen Mockup: Dashboard

Screen Mockup: Data Analysis Page

Screen Mockup: Chat Interface

Screen Mockup: Recommendations

Project Technical Specifications

- User interface will be created using both the React and Tailwind frameworks.

- The backend of the web application will be developed with the .NET framework using C# as the language of choice.

- Database will be created and managed using the MySQL database management system.

- Will use Python's Prophet library to conduct all time-series forecasting.

- The web application will be hosted using Azure cloud services. Azure's authentication services will also be used to handle all user creation and authentication.

Project System Architecture
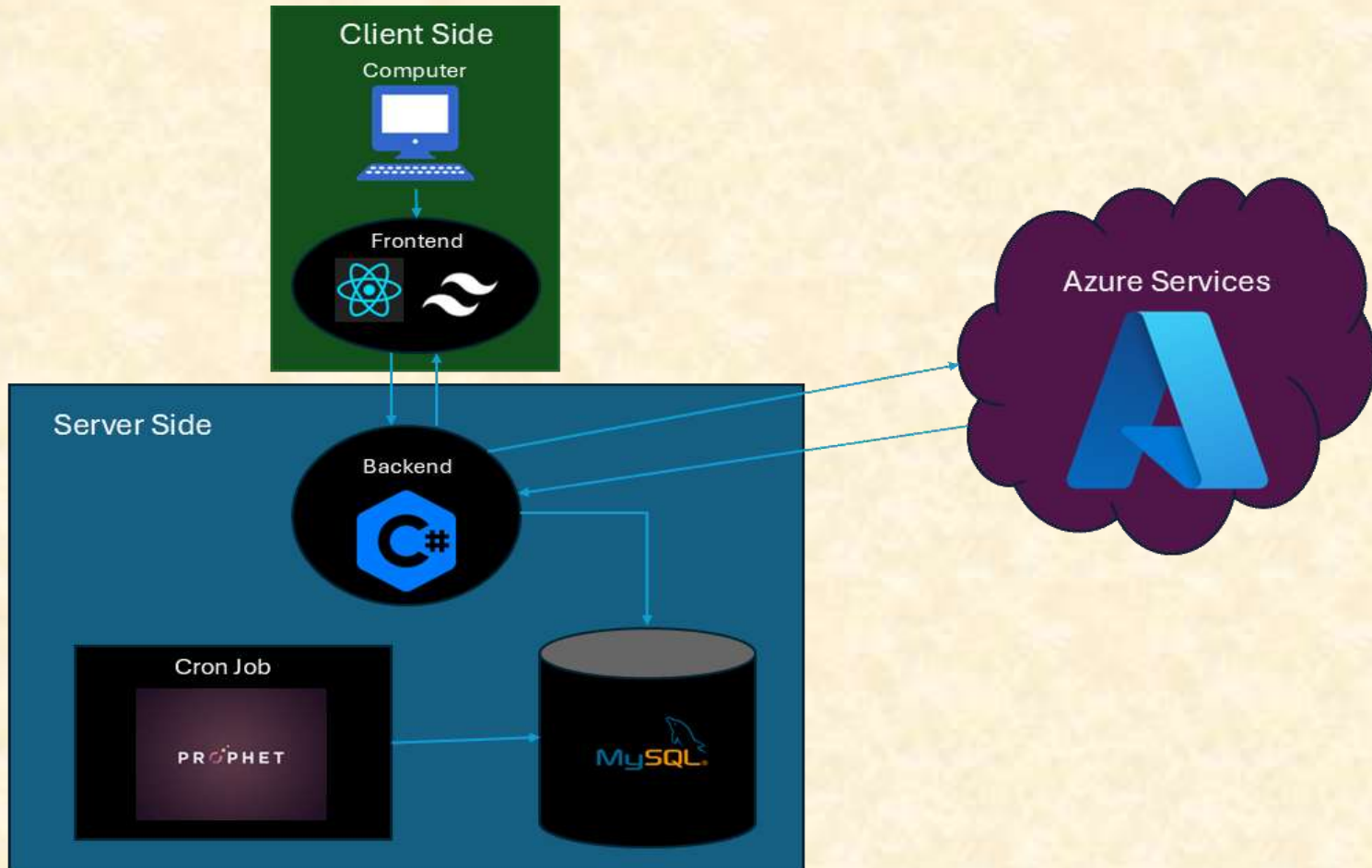
Project System Components

- Hardware Platforms
  - Azure Cloud Infrastructure
- Software Platforms / Technologies
  - Prophet
  - Azure OpenAI Services
  - Azure SQL Database
  - React
  - .NET

Project Risks

- ## Integrating Python REST API with .NET
  - Integrating a Python Rest API with a .NET application could result in issues because of compatibility between the different platforms. It is pivotal to ensure that the two different platforms can communicate data to one another effectively.
  - Researching documentation and viewing tutorials on connecting two separate APIs to the same database. Using mock data to test integration before moving to real data.

- ## Implementing Cron Job for Monthly Data Updates Using Prophet
  - Implementing a system so that the database can be updated monthly, and new predictions can be made.
  - Break down the task into smaller more manageable pieces, start with smaller more simple testing data and write to the database using the Cron job, then configure the job to write to the database using real data.

- ## Misinformation from Large Language Model
  - We need to ensure the accuracy of the information produced by the Large Language Model to ensure that people are not receiving inaccurate data or incorrect predictions.
  - Curating the data and limiting the scope of the LLM by controlling responses. Set checks for the information produced by LLM to ensure that the data given by the model is accurate.

Questions?

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