**MICHIGAN STATE**

**U N I V E R S I T Y**

# Project Plan Presentation

## Predictive Claims Scoring

### The Capstone Experience

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*From Students…*
*…to Professionals*

# Project Sponsor Overview

- Headquartered in Okemos, MI

- One of largest dental insurance companies in the US

- Subsidiary of Delta Dental

- Develops software to streamline insurance operations

# Project Functional Specifications

- Managing numerous dental insurance claims is time-consuming: detecting claims that are most likely to be reported with FWA(fraud, waste and abuse) can **accelerate claim reviewal.**

- Identify patterns in attributes are most prevalent in claims likely to be reported with FWA.

- Accelerate workflow at Delta Dental in sorting claims that need to be reviewed more carefully.
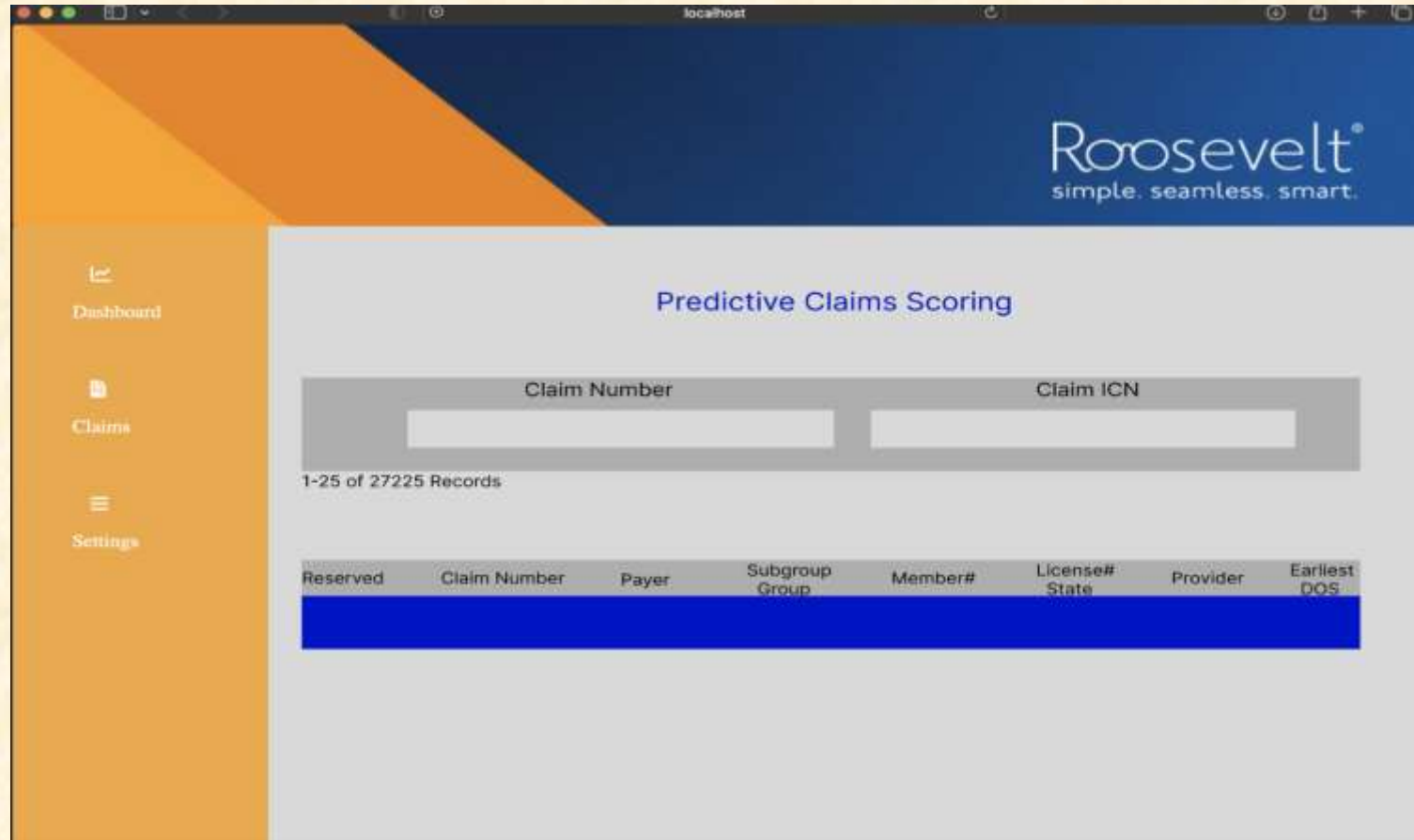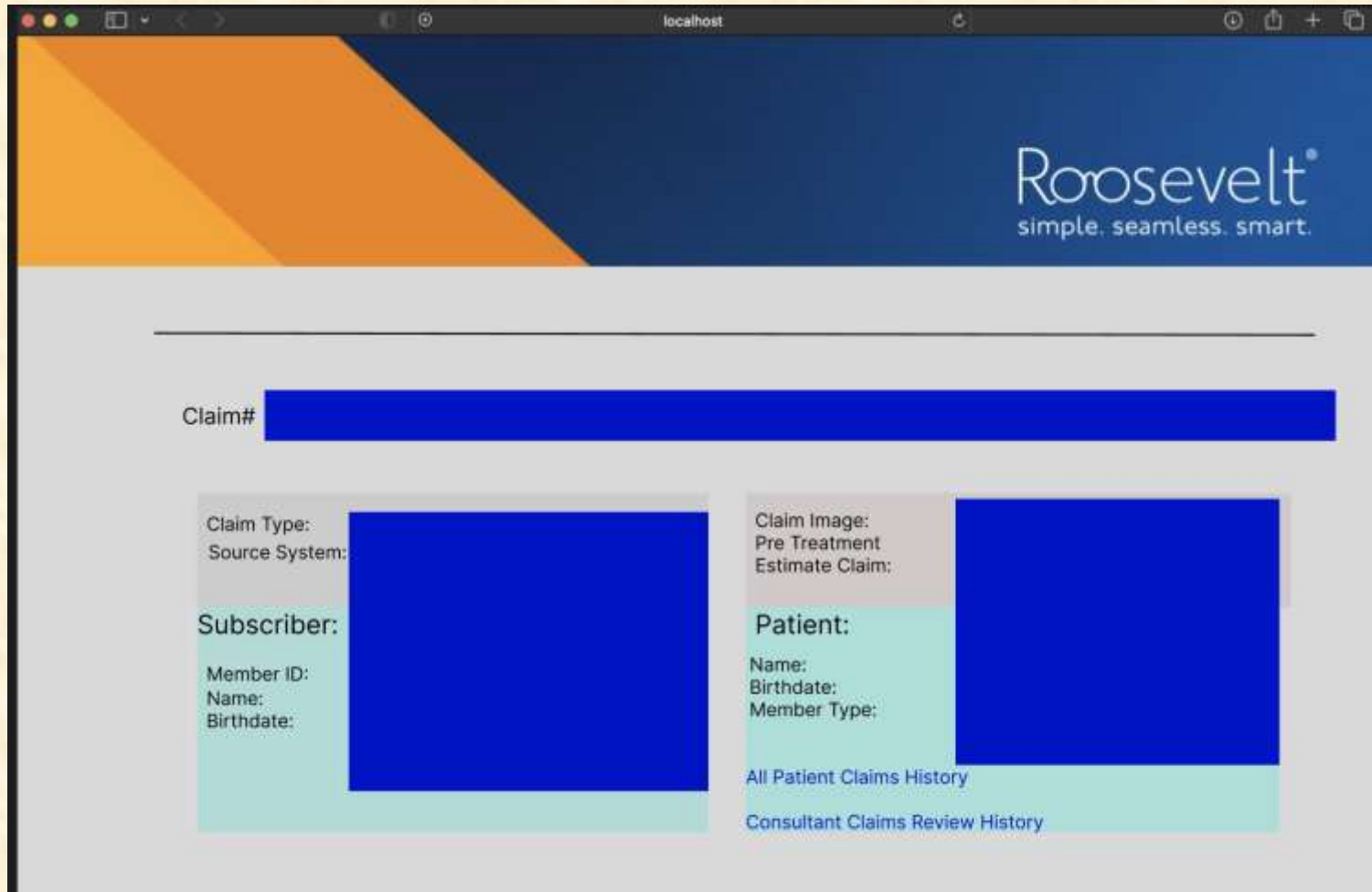
# Project Design Specifications

- Tableau Dashboard:
  - Display raw data from Delta Dental claims
  - Graphs showing the relationships between attributes from data and the classification ML model output
  - Correlation and confusion matrices
- Web App:
  - Search bar to find specific past claims
  - List of previously classified claims and their attributes
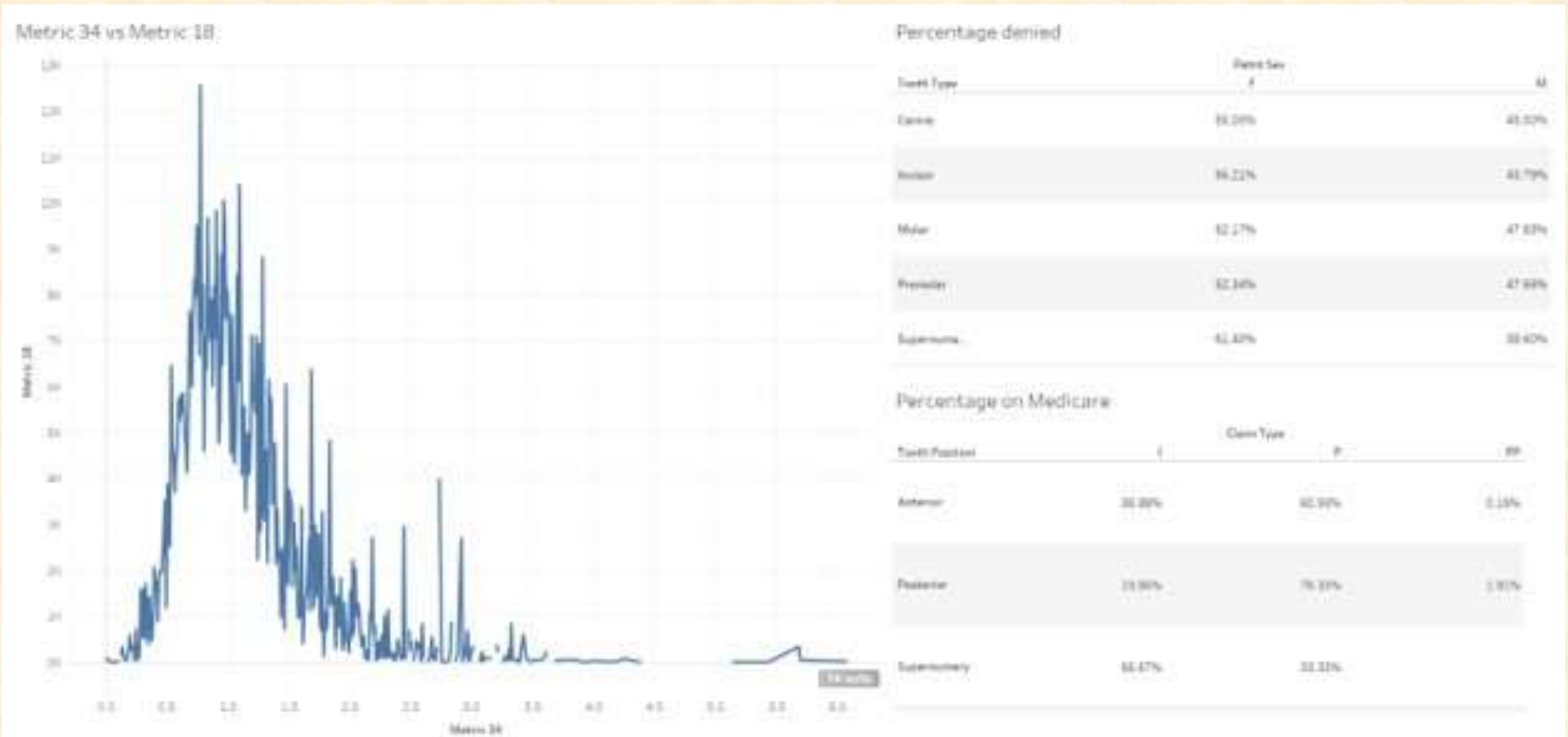  - Bar to paste and classify new claim and identify most important attributes
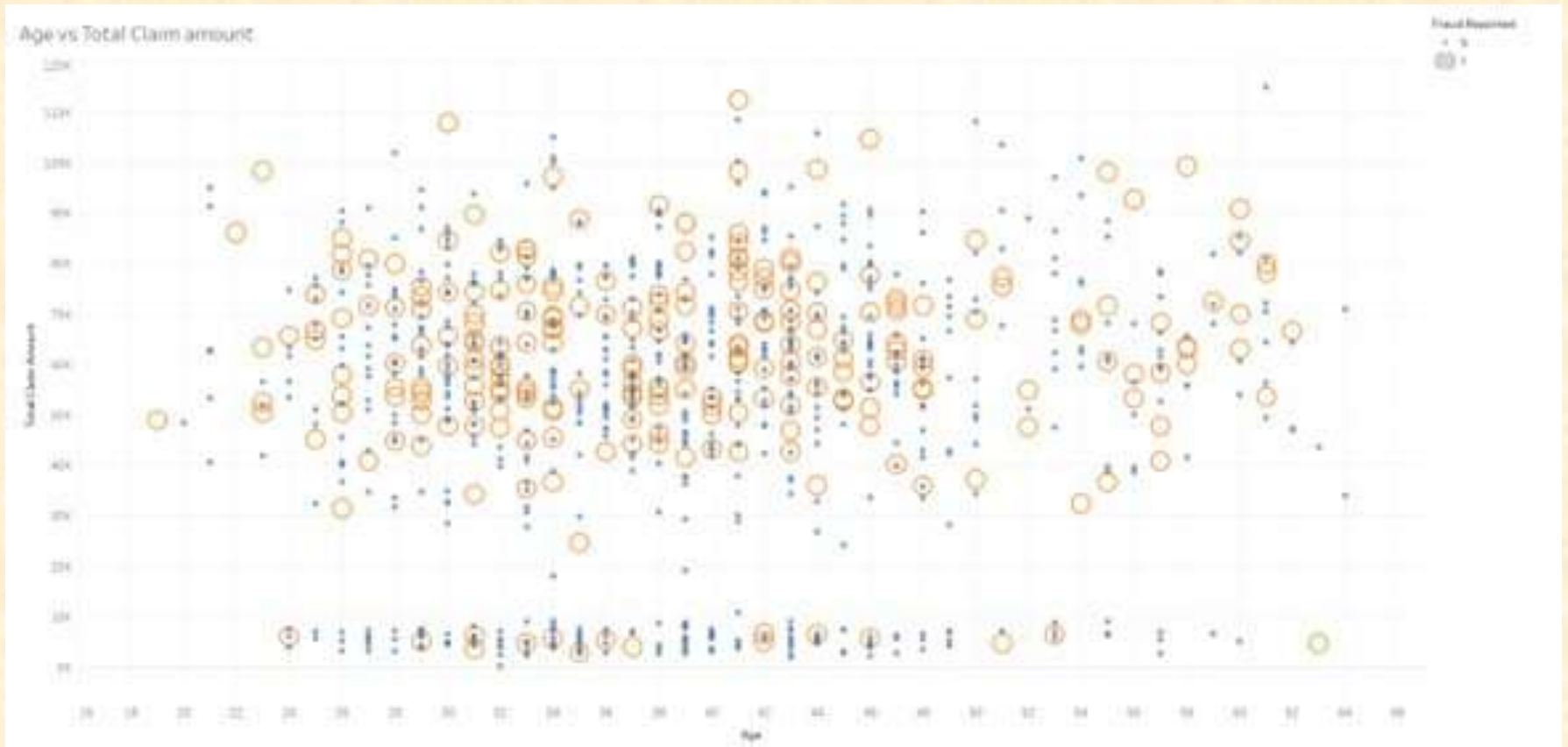
# Screen Mockup: Web App Home Page

# Screen Mockup: Claim Search Results

# Screen Mockup: Tableau Dashboard 1

# Screen Mockup: Tableau Dashboard 2

# Project Technical Specifications

- Web App Deliverable:
  - Built with React as an interface for ML model.
  - Fetch data from Snowflake with FastAPI.
  - All output and UI for business analysts here.
- Tableau Deliverable:
  - Gather data from Snowflake at runtime.
  - ML model connected with Tableau Python integration.
  - All graphs and UI for data scientists here.

# Project System Architecture
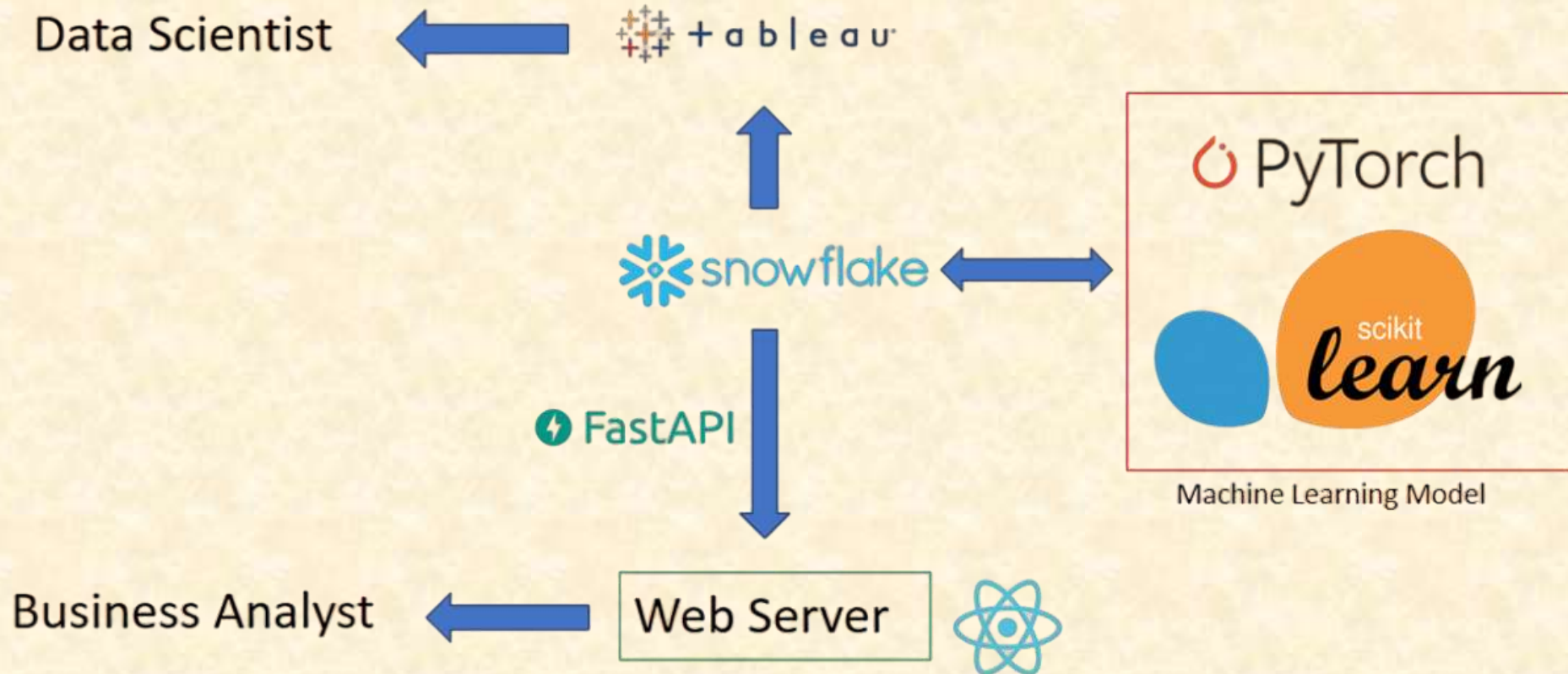
# Project System Components

- Software Platforms / Technologies
  - Snowflake: Company-provided data cloud
  - FastAPI: Web framework to build APIs
  - React: Web App platform
  - Tableau: Visual analytics platform
  - Gitlab Python Technologies:
    - PyTorch and Scikit-Learn
    - Open-sourced libraries that support machine learning and data analysis

# Project Risks

- Finding optimal machine learning model
    - Need model that classifies which claims need further review as well as providing a percentage confidence score.
    - Develop a few models and present them to client.
- Identifying most important metrics from data
    - Need to find the most important factors in determining FWA among 46 attributes. Important for business-side employees.
    - Fine-tune model parameters until we have clear/consistent results. Talk to client about what attributes mean in insurance business.
- Create an easy-to-understand web app
    - Insurance companies work with business professionals and have many audits. Graphics need to be easy to understand and explain to encourage trust in them.
    - Produce many prototypes of the web app for our client's review.
- Switch between batch and real-time claims scoring
    - Two project deliverables for business analysts and data scientists require batch and real-time claims scoring, respectively. Machine learning model must do both scoring types.
    - Start model with scoring one claim and adapt to scoring many.

# Questions?