MICHIGAN STATE UNIVERSITY

Project Plan Presentation

Logged-In Branch Experience

The Capstone Experience

Team MSUFCU

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From Students…
…to Professionals

Project Sponsor Overview

- MSU Financial Credit Union
- Ensuring financial security
- Excellent customer service

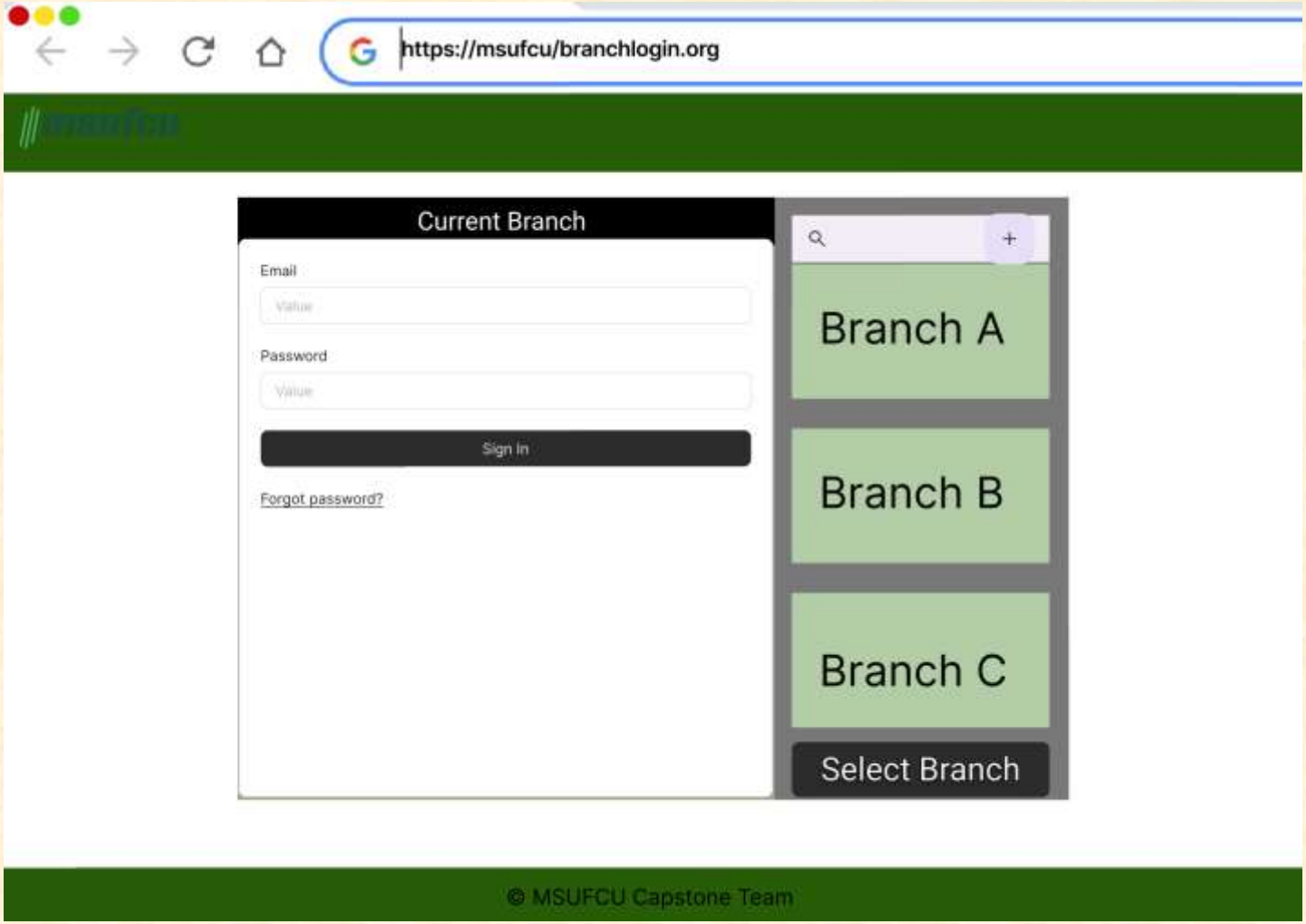
Project Functional Specifications

- In person requests becoming more intricate
  - More online assistance available
- Provide a seamless in person experience
- Eliminate need to verify oneself
- Use facial recognition to identify members

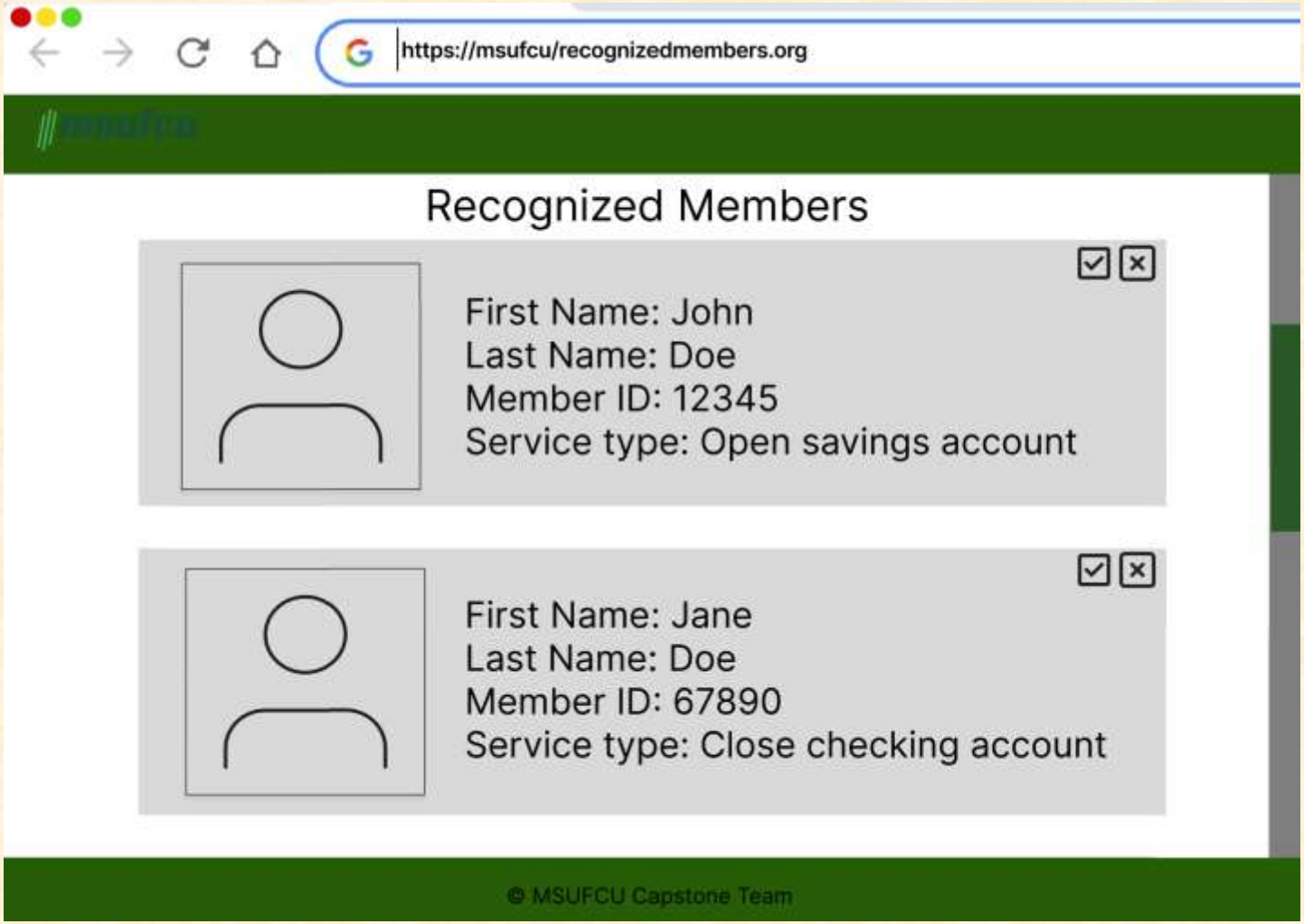
Project Design Specifications

- **Neural Network**
  - Isolate a face (or faces) from camera footage
  - Creating a numerical representation of a face
- **Web App**
  - Proving that the facial recognition software can identify customers
  - Simulating the teller's experience
- **Database**
  - Storing a base image for each customer
  - Displaying customer information for the teller

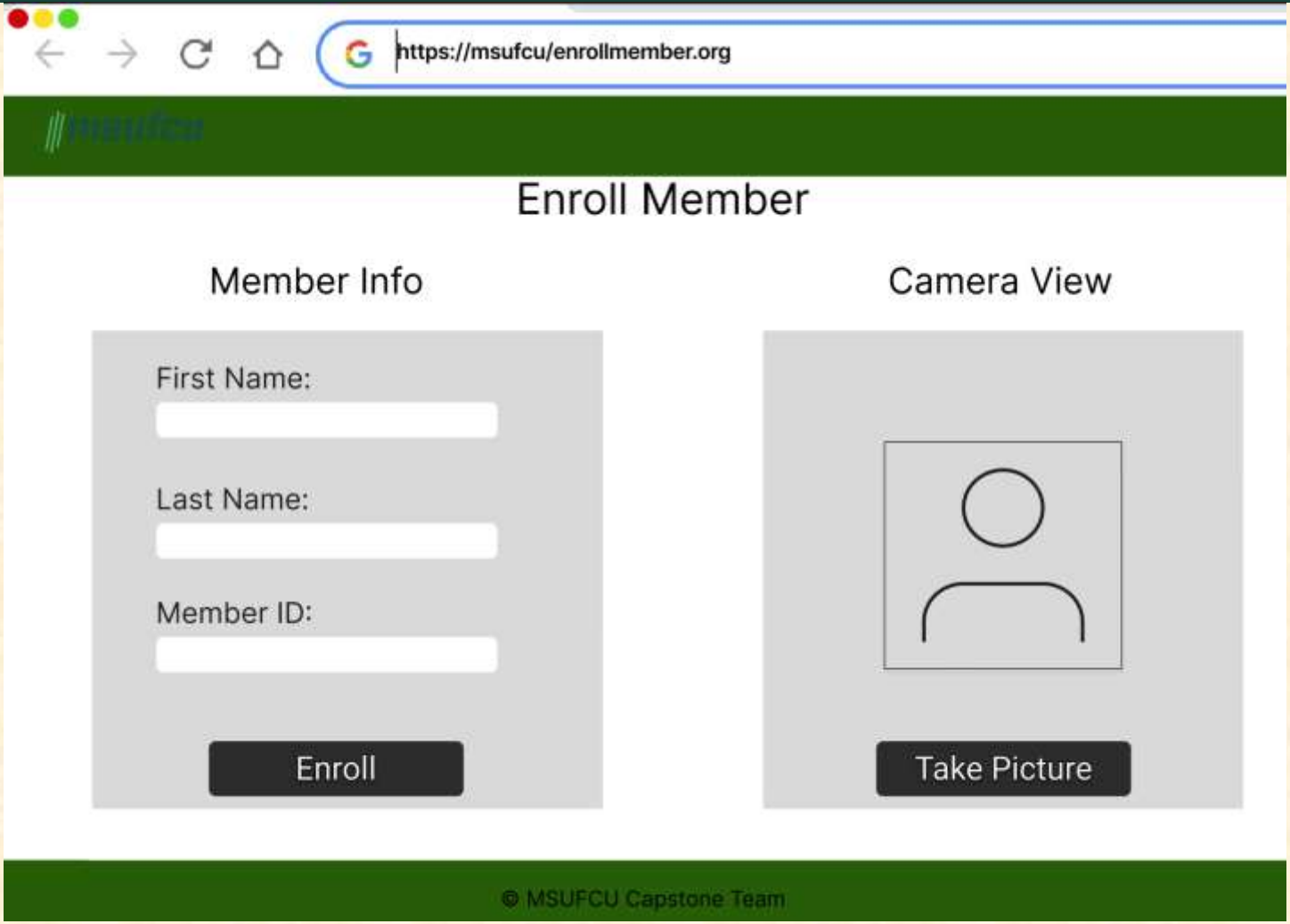
Screen Mockup: Branch Login



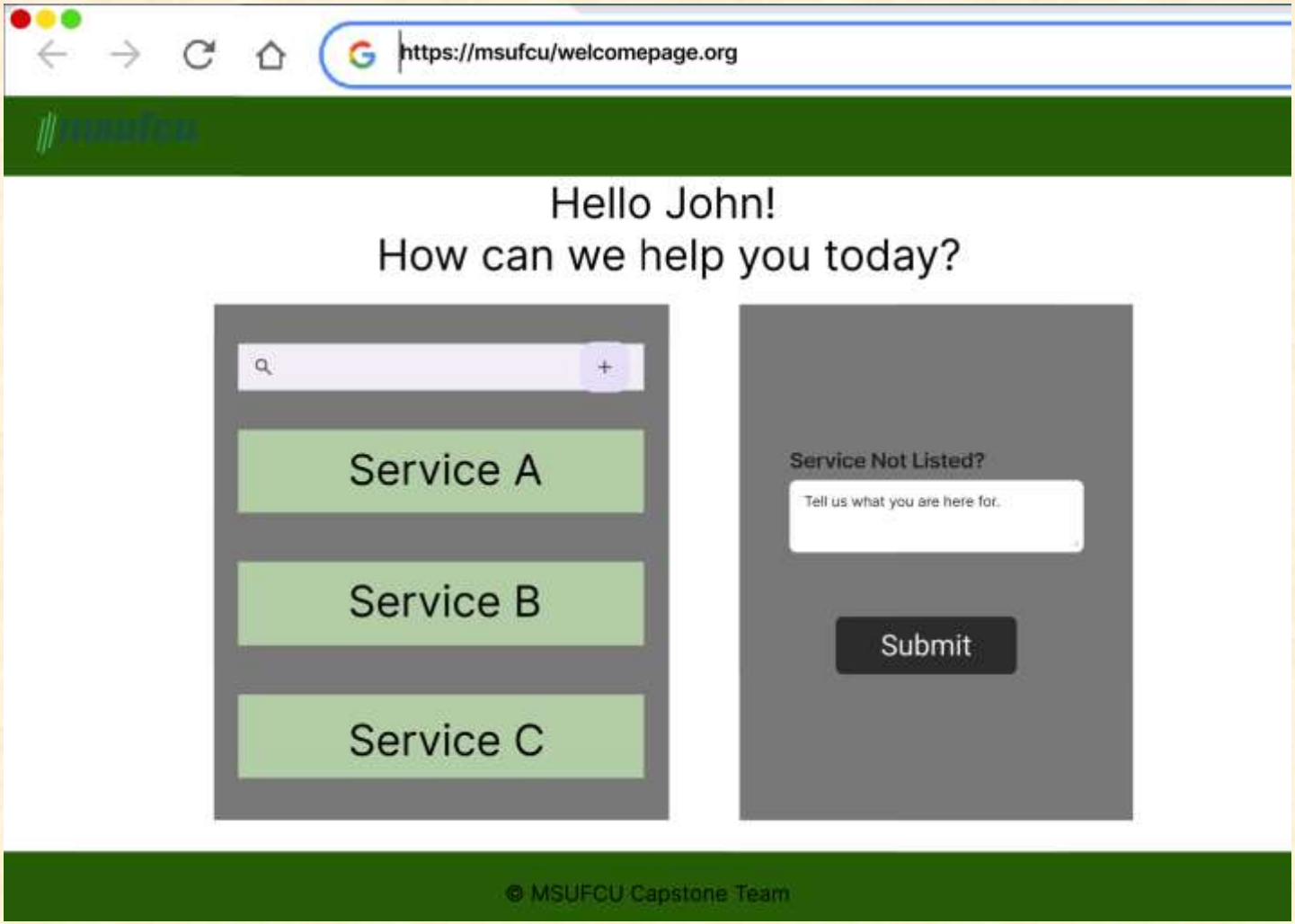
Screen Mockup: Customer Queue



Screen Mockup: Teller-side Enrollment



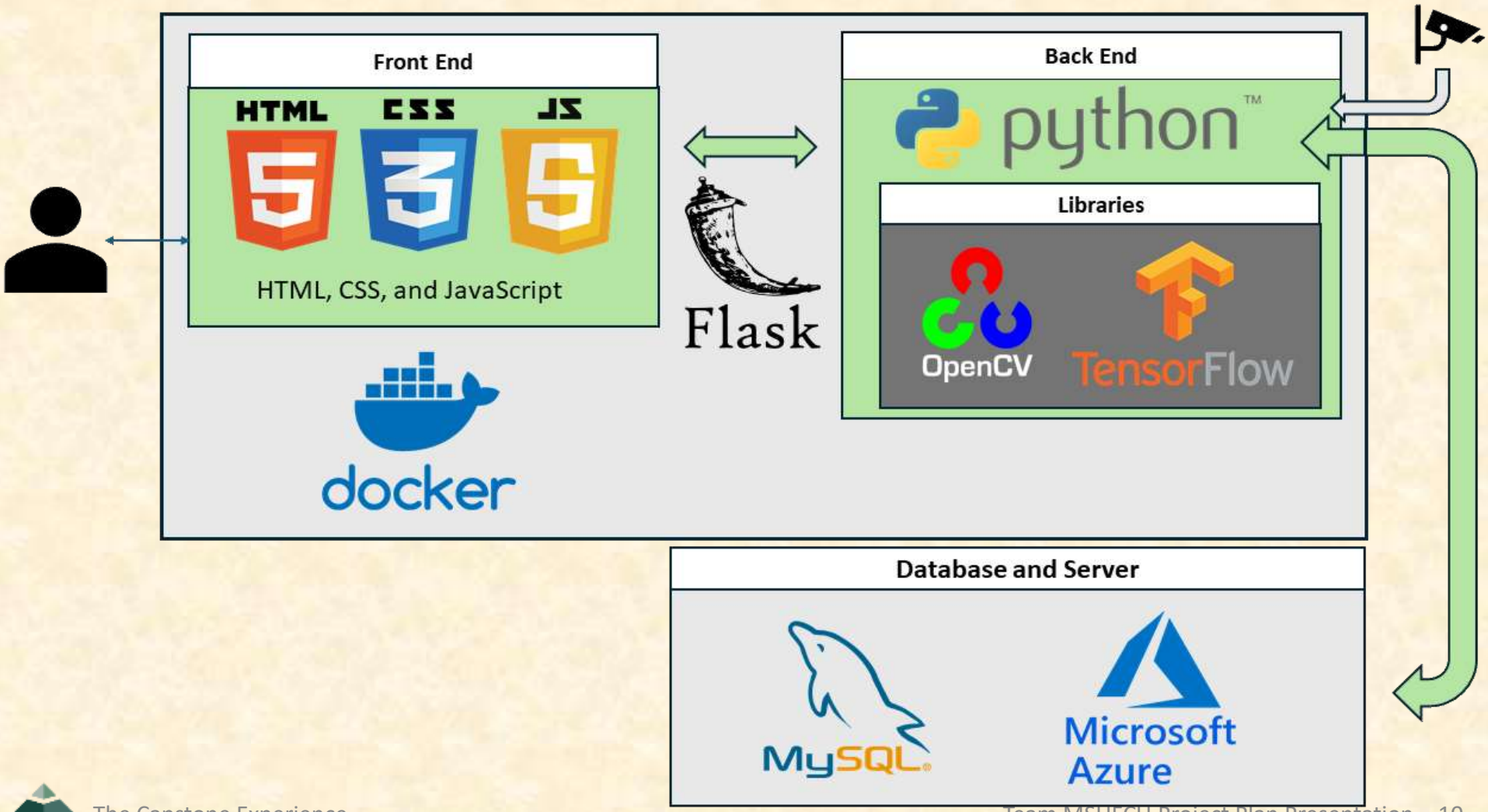
Screen Mockup: Customer Service Option



Project Technical Specifications

- **Flask**: Handles HTTP requests, serves the frontend, and processes data.
- **OpenCV**: Captures and processes the webcam feed for face detection.
- **TensorFlow**: A trained CNN model which classifies facial data to compare against existing customer data.
- **MySQL Database**: Stores customer data, face embeddings, and recognition results.

Project System Architecture



Project System Components

- **Hardware Platforms**
  - Ubiquity G5 Bullet Camera
- **Software Platforms / Technologies**
  - Flask
  - Docker
  - OpenCV
  - TensorFlow
  - MySQL
  - Microsoft Azure
  - Python
  - CSS
  - HTML
  - Java Script

Flask

docker

Project Risks

- **Risk of Data Leaking**
  - **Description:** Customer facial data and sensitive information could lead to identity theft.
  - **Mitigation:** One-way encrypt important data if possible, If not, encrypt the data in reversible method (cryptography).
- **Risk of Misidentification**
  - **Description:** Incorrectly identify a customer as another individual.
  - **Mitigation:** Cross-check from both multiple camera and teller.
- **Cross-Branch Data Misallocation**
  - **Description:** Customer information incorrectly displayed at the wrong branch.
  - **Mitigation:** Link camera to the database with corresponding branch ID. Branch Login System for the bank staff (Socket IO group to ensure synchronous updates).
- **Obstructed Face Recognition Failure**
  - Description: Camera unable to identify a customer with facial covers.
  - Mitigation: Implement detection mechanism during facial feature extraction to identify when a customer's face is obstructed, prompting customer to remove facial covers.
- **Multiple Customer Recognition Conflict**
  - Description: Potential confusion in greeting order when multiple customers enter simultaneously.
  - Mitigation: Dual-camera system. First system detect and place customers on a list. Standpoint system reconfirm from the list and display a greeting message for service options.

Questions?