

Boarding Kiosk Problem Description

Project Objective:

A terminal application for an airport to perform an automated airplane boarding process without human assistance shall be realized.

The boarding kiosk shall fulfill the following requirements:

- The terminal shall scan the passenger boarding pass.
- Flight and passengers personal information shall be extracted from scanned boarding pass.
- The extracted flight and passengers personal information from the boarding pass shall be validated against the flight manifest and the boarding process shall be aborted, if the validation fails.
- The terminal shall scan the ID card of the passenger.
- The personal information shall be extracted from the scanned ID card.
- The extracted personal information from the ID card shall be validated against the extracted personal data from the boarding pass.
- The terminal shall capture a video of at least 10 seconds.
- The passengers face shall be extracted from the video.
- The extracted face from the video shall be validated against the extracted personal information from the ID card and the boarding process shall be aborted, if the validation fails.
- The terminal shall scan the passengers carry-on baggage.
- Prohibited items shall be identified in the scanned carry-on baggage and the boarding process shall be aborted, if prohibited items are found.
- The terminal shall print a positive message on the display and grant access to the plane when all validation steps were successful.
- The terminal shall print a negative message on the display and grant access to the plane when one of the validation steps failed.

Data Sources:

- Flight Manifest (flight database)
- Passenger Boarding pass images (boarding pass scanner)
- Passenger ID card images (ID card scanner)
- Passenger video (camera)
- Passenger Carry-on items images (baggage scanner)

The Solution Strategy:

- For extracting flight and passengers personal information from the scanned boarding passes, the **Azure Form Recognizer** service will be used. A new model will be trained to recognize the layout and fields of the *Udacity Airlines* boarding passes.
- The extracted flight and passenger information will be matched and compared to a record in the flight manifest file.
- For extracting the passengers personal information from the scanned ID cards, the **Azure Form Recognition Digital ID** service shall be used.
- The extracted passengers first and last name from the ID card will be matched against the values extracted from the boarding pass.
- For extracting the face from the passengers camera video, the **Azure Video Indexer service** will be used.
- For validating the face extracted from the ID cards against the face extracted from the passengers camera video, the **Azure Face Recognition** service will be used.
- For identifying prohibited items (lighters) from the scanned carry-on items, the **Azure Custom Vision** service will be used. A new model will be trained to detect lighters in the image.
- If all validation steps succeed, a welcome message with all passengers relevant data will be printed to the screen and access will be granted.
- As soon as one validation step fails, a help message will be printed to the screen and access will not be granted.