

Project Problem Description

Project Objective:

The project's main objective is to build an airline passenger on boarding kiosk application. The application will take advantage of the emerging technology such as Azure AI Cognitive Services to improve the overall on boarding experiences for customers will ensuring safety by making sure only validated customers can board the plane and they carry on luggage passes the required prescreening process steps.

For the final production version of the kiosk application the following functions will be provided:

- Using one of the available on boarding kiosk machines a customer should be able to quickly scan their ID Card (e.g. Driver License) and boarding pass.
- The kiosk should be able to extract the passenger information from their ID card and validate it matches the scanned boarding pass. If the information does not match a nearby customer service representative will be notified to assist the passenger.
- The kiosk will ask the customer to record a 10 second video to perform facial recognition and compare the passenger face from the video against the provided ID picture.
- The kiosk should provide a way to scan the passenger's carry on baggage and check for any unauthorized items and prevent the passenger from boarding the plane.
- Once the passenger passes all the kiosk validation checks the kiosk will greet the passenger welcoming them to their flight and ask them to board. If there are any issues the passenger will not be able to board and instructed to talk to a nearby customer service representative.

Kiosk Simulation:

For the project we will be building a simulated kiosk experience to demonstrate how Azure AI Cognitive Services can be used to identify passengers using their documents and face to validate they pass the prescreening process for the Kiosk.

For the simulation the following will be used:

- A simple 5+ person manifest containing the required information to check the onboarding passenger using their ID and boarding pass.
- The manifest will include a simulated flight passenger list and include each passenger's name, date of birth, flight information and whether they have any carry on luggage.
- Fabricated passenger Digital IDs and boarding passes will be created for training the Azure AI Cognitive Services and verifying the simulated passenger when they are checking in.
- The project's main developer will be one of the simulated passengers and they will create a short video to be used for facial recognition.
- During the simulation passengers with carry on items will be scanned and check if their luggage contains a lighter..

- Azure AI Cognitive Services and other Azure cloud resources will be used to show how they can be used in the solution to build the simulated automated boarding process.

Simulation Data Source:

The following data sources will be used during the project:

- Fake flight manifest list including 5 or more passengers
- Fake Digital ID cards for the passenger, including the project developer which will be used for testing
- Fake boarding pass for the passengers include in the fake flight manifest
- Short video of the project developer showing their face.
- Sample carry on luggage images for testing the lighter validation model

Solution Strategy:

The following defines the flow for the project and how Azure AI Cognitive Services are used by the defined solution.

- A custom boarding pass AI model will be build using Azure Form Recognizer service
- The Azure Form recognition digital id service is used to extract the person information and face from one the fake digital IDs
- The extracted passenger information from the boarding pass will be compared to the testing flight manifest
- If the passenger is found in the manifest their person identity will be validated using their digital ID
- Using Azure Video Indexer Service and Face API the extracted photo from the passenger's digital ID will be compared to the passenger's face extracted from the he passenger's video
- A custom Azure vision model will be trained and used to identify if the passenger's carry on luggage contain any lighters using the sample carry on images
- Once all validation is completed a message will be displayed to the passenger greeting them to board the plane or if one of the validation failed telling them to talk to a customer representative.