Project Objective:

The objective of this project is to develop a prototype of an automated passenger boarding kiosk to assist with pre-flight boarding procedures. The automated system will have multiple functions that can be used in a wide variety of business processes like airline boarding operations, specifically identity verification to board the flight and automated customer feedback collection.

Here are the working condition for the prototype:

- Airline passengers should be able to scan their ID card and Boarding pass at the kiosk.
- The kiosk should be able to extract passenger information from the boarding pass and then verify it from the ID card.
- Kiosk should be able to take a 30 second video of the person and perform facial recognition to match the live person at the kiosk with the ID card provided during the scan.
- Kiosk should be able to extract the person's emotions with the same video
- Kiosk should also be able to scan the passenger's carry-on baggage and identify any prohibited item including lighter or not.
- If all scanning and validation goes well, the kiosk greets the passenger with a final message that "He/she can board the plane" or if there are issues, the kiosk can suggest the passenger to "Please see an airline representative to complete the boarding along with issues during the validation process".

The simulated kiosk experience can be created as below

- We have created a passenger manifest file which contains a list of 6 passengers with their information
- The text data collected from the boarding pass and digital ID is used to cross-reference with the flight manifest to validate flight boarding. If the page title is truncated on the left-side panel, you can hover your mouse over the page title and see it in full.

- The origin and destination data is used to provide more information about the destination on the kiosk screen.
- ID photo validation matched with a given photo (extracted from video) - 80% above the threshold.
- Collect passenger emotion as positive or negative feedback.
- Passenger carry-on items are also scanned for lighter and if lighter is present, the passenger is flagged for prohibited items in the carry-on baggage.

Data Sources

- Flight manifest list for all passengers (6) (Azure Blob Storage)
- Passenger ID card
- Passenger boarding pass
- Passenger 10-30 second video showing their face
- Passenger carry-on items photo

The solution strategy

- We will use Azure Form Recognizer to train a model to extract information from identification cards and boarding passes.
- The passenger information extracted from the boarding pass, will be validated from the manifest list.
- If the person’s name exists in the manifest list then the person's identity will be validated from the personal ID.
- We will use Azure Computer Vision, Face services, and Video Indexer will be used to match a given passenger's face from digital ID with the face extracted from a 30-second video.

- We will use Azure cognitive service-based computer vision resources to build a custom lighter detection model first and use the custom model to detect lighter probability in given test images.