Project Plan Presentation
Adaptive Assessment Generator for Tech-Ops Training
The Capstone Experience
Team United Airlines Training

Akhil Tatineni
Aref Zeitoun
Eshan Dixit
Eric Raines
Lama Alqrni
Thad Greiner

Department of Computer Science and Engineering
Michigan State University
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Project Sponsor Overview

• Major American Airline, ranked one of the best airlines in the world
• Headquartered in Willis Tower, Chicago with 8 main hubs across the US
• Founding member of the Star Alliance: one of the worlds largest airline alliances
• Fleet size consists of 841 aircrafts with another 544 in production or ordered
Project Functional Specifications

• Problem:
  ▪ Manual creation of questions from aircraft training manuals

• Solution:
  ▪ Web application to provide assessments and training content
    ▪ Multi-layer account system
    ▪ AI generated questions

• Utility:
  ▪ Reduce time, money, and human resources spent
  ▪ Enhance student experience and comprehension
Project Design Specifications

• Has separate viewpoints for a trainee and an instructor
• Trainees can look through training materials and take assessments
• Instructor can add assessments and questions
• Instructor can manually input questions and generate questions using Machine Learning
Screen Mockup: Trainee Dashboard
Screen Mockup: Trainee Assessments
Screen Mockup: Question Wrong
Screen Mockup: Instructor Dashboard
Screen Mockup: Add Assessment
Project Technical Specifications

- Front end using React JS along with HTML and CSS
- REST API using Django Python library
- Firebase Realtime Database (JSON)
- PyTorch for Machine Learning
Project System Architecture

Diagram:
- Front end: HTML, CSS, JS, React JS
- Web application: HTTP requests
- Back end: Python, Django, PyTorch
- Machine Learning Model
- Docker Container
- Database: Firebase
- Server: AWS
Project System Components

• Hardware Platforms
  ▪ AWS
  ▪ iPad/Desktop

• Software Platforms / Technologies
  ▪ React JS, HTML, JavaScript, CSS, Axios
  ▪ Python, Django, PyTorch, Requests
  ▪ Firebase and Cloud Store
  ▪ Postman
  ▪ Docker, AWS
Project Risks

• Visual Data
  ▪ Visual data is often unstructured and requires lots of processing power
  ▪ Focus on text data and use Natural Language Processing techniques

• Authentication
  ▪ Unauthorized access to sensitive information due to weakness in the authentication process
  ▪ Strong password policies, access keys, two-factor authentication, hashing and salting

• Generating “valid” questions
  ▪ Machine Learning model generating questions that do not enhance user training
  ▪ Using data and input from instructors to modify model parameters

• Runtime
  ▪ Long runtime to generate questions
  ▪ Machine learning pipeline, experimenting with different algorithms
Questions?