



SOAR Capstone Presentation

The Aviators

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Our sponsor

- Our Sponsor is Arjomand Kalayeh
- He is the CEO of True Course Aviations
- What does our sponsor do?
 - Teach people how to operate aircraft
 - Use flight simulator software

The Flight Simulator

○ Prepar3D

- Developed by Lockheed Martin
- Open to development

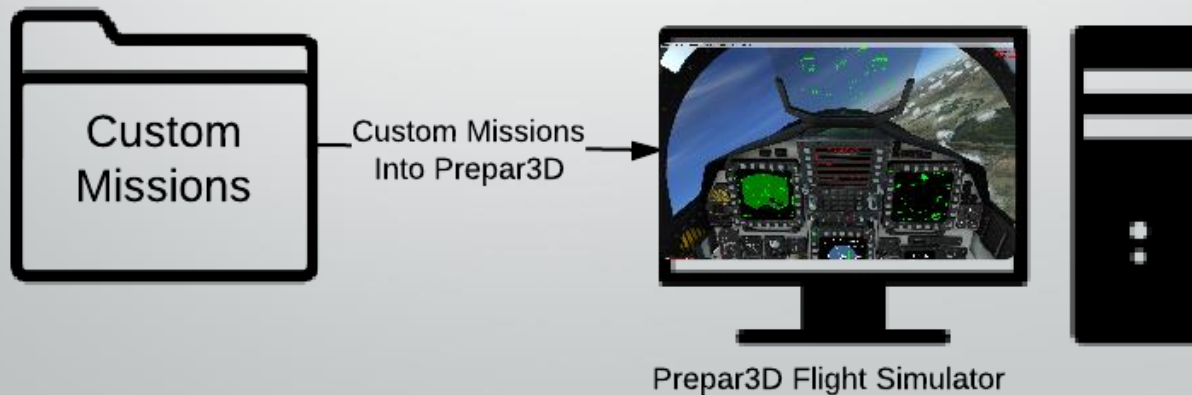


Sponsor's goal

- Our sponsor wants to monetize pilot training using Prepar3D
- To accomplish this, a system called SOAR is being developed

The current system

- Custom missions
- Flight Simulator
 - Aggregates user mission data



How is the data handled?

- There is no current way to process user data
- Without this component
 - Users **will not** receive feedback
 - Sponsor **will not** make a profit



Our proposed solution

○ The SOAR Web Application

- Will receive data from Prepar3D
- Users will receive feedback
- Sponsor will have the opportunity to profit





Key Requirements

Based on sponsor request

Key Requirements - Overview

- User Management System
- Data Analysis
- Dashboard

Key Requirements - Users

- User levels
 - System administrator
 - Institution administrator
 - Instructors
 - Student
- Login
- Register

Key Requirements - Data

- Users upload an encrypted XML file
- Parsed and save to database
- Determines student statistics

Key Requirements - Dashboard

- Course selection
- Upload progress
- View progress

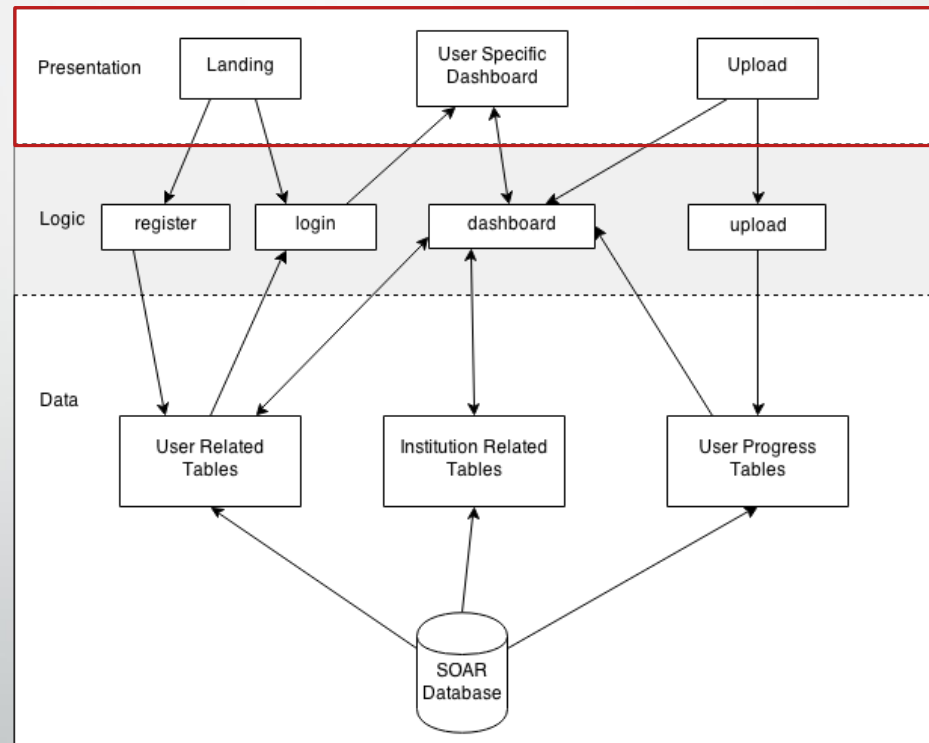


Architecture

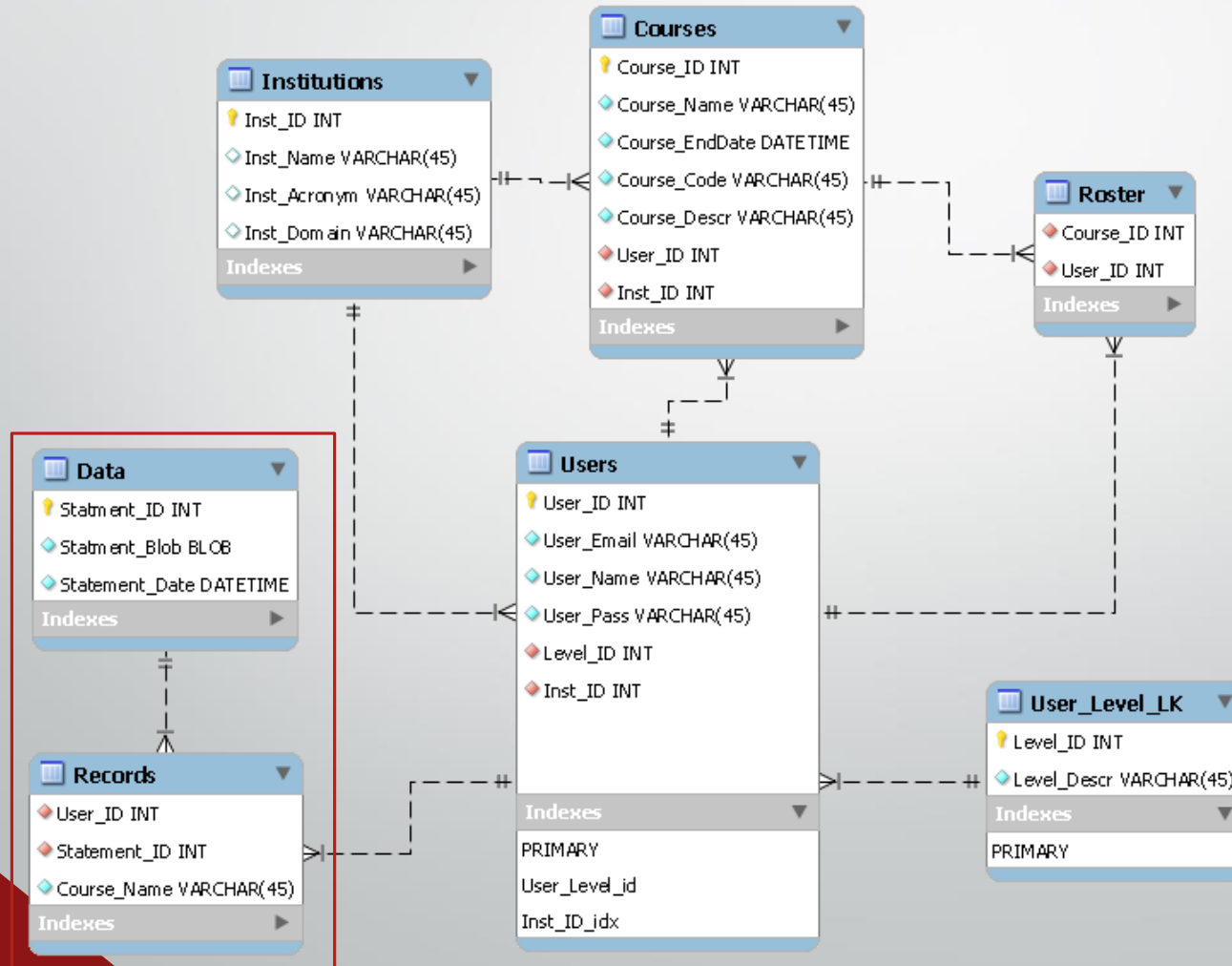
Architecture - Overview

Three-Tiered architecture

- Presentation
 - Web site display
- Logic
 - PHP scripts
- Data
 - Tables in database



Database Diagram



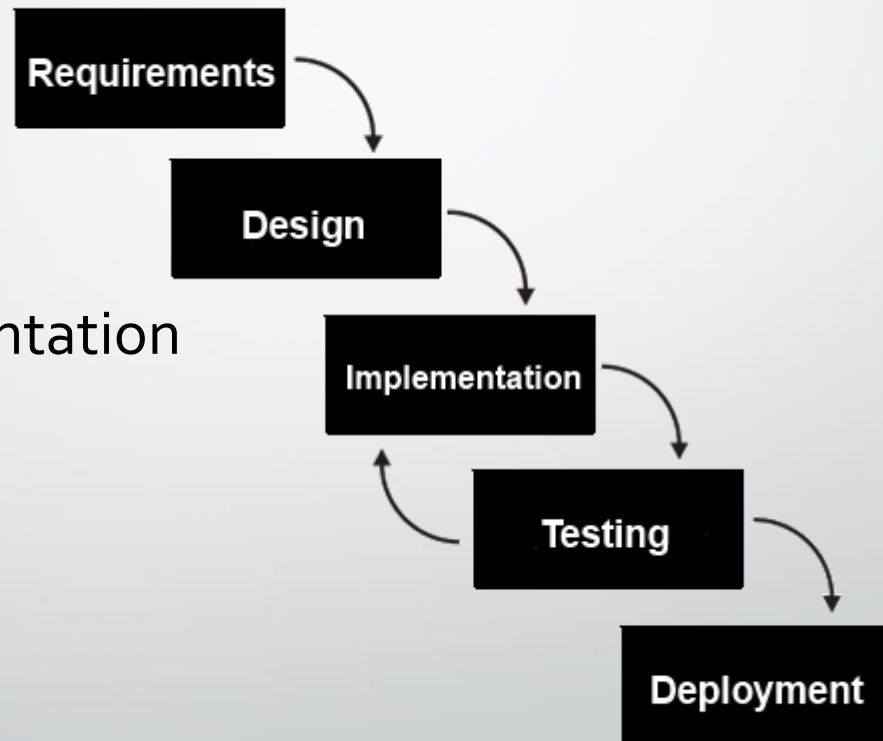


Processes and Tools

Development Process

○ Waterfall Model

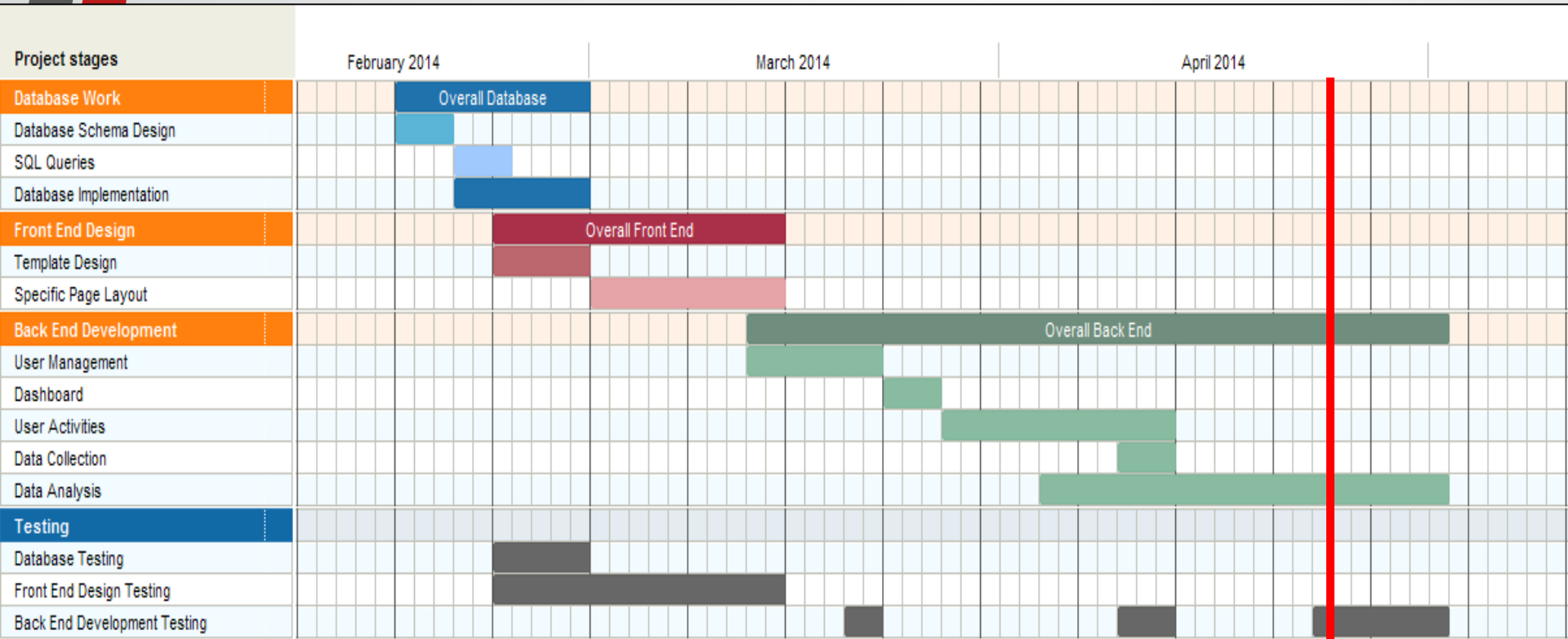
○ Incremental Implementation



Development Tools

- Tools:
 - Todoist
 - Github and web-hooks
- Allows for continuous integration

Schedule



On Schedule



Implementation

Implementation – Landing

[SOAR](#) [About](#) [Services](#) [Contact](#)


[Login](#) [Register](#)

Aviation training with the help of online tools




Implementation - Menus


Administrators

-  SOAR Dashboard
- Add Institution
- Delete Institution
- Add System Admin
- Delete System Admin


Institution Administrators

-  SOAR Dashboard
- Update Institution
- Manage Teachers
- Manage Courses

Teachers


-  SOAR Dashboard
- View Courses
- View Students

Students Pre-pay

-  SOAR Dashboard
- Purchase Subscription

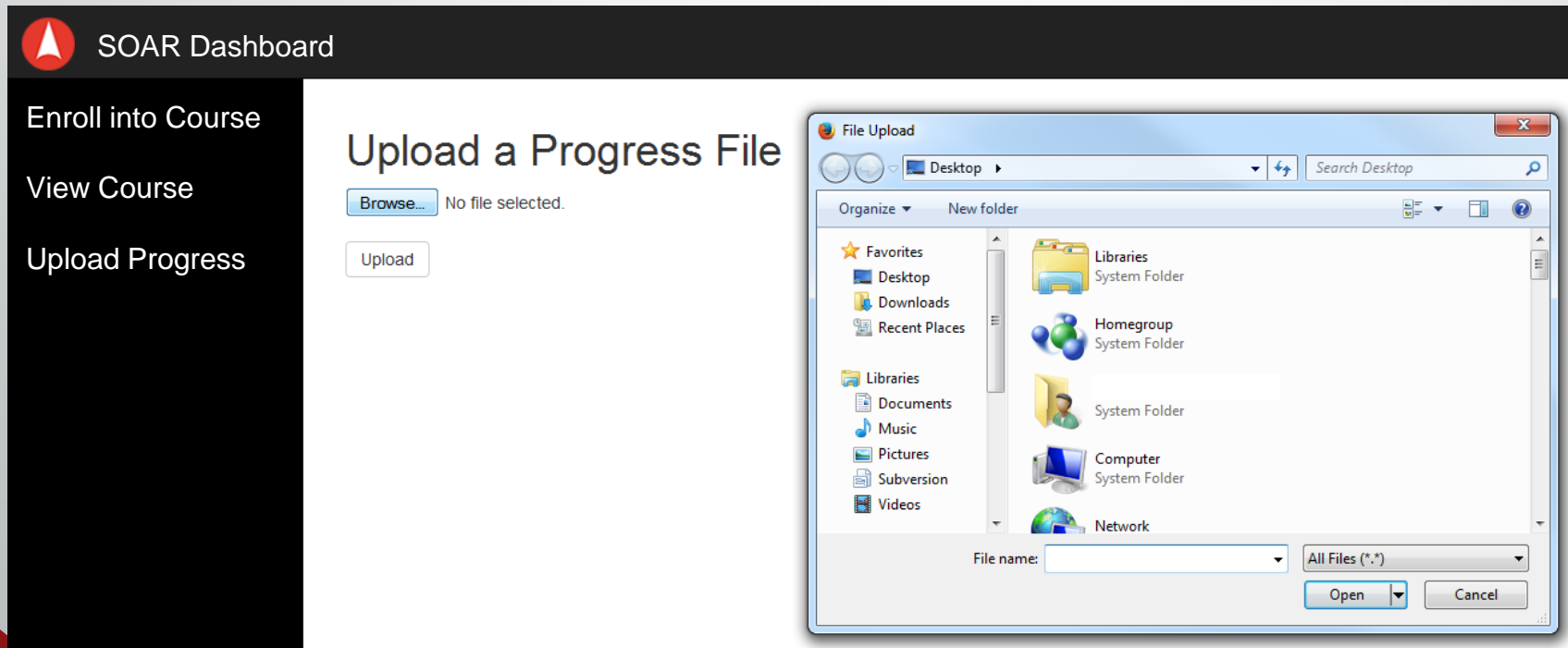


Students Post-pay

-  SOAR Dashboard
- Enroll into Course
- View Course
- Upload Progress

Implementation - Uploading

- Saved as BLOB type in database



The image shows a screenshot of the SOAR Dashboard interface and a Windows File Upload dialog box. The dashboard has a dark sidebar with navigation options: "Enroll into Course", "View Course", and "Upload Progress". The main content area is titled "Upload a Progress File" and contains a "Browse..." button (with the text "No file selected." next to it) and an "Upload" button. The File Upload dialog box is open, showing the "Desktop" location. The left pane lists "Favorites" (Desktop, Downloads, Recent Places) and "Libraries" (Documents, Music, Pictures, Subversion, Videos). The right pane shows "Libraries" (System Folder), "Homegroup" (System Folder), "System Folder", "Computer" (System Folder), and "Network". The "File name:" field is empty, and the file type is set to "All Files (*.*)". The "Open" and "Cancel" buttons are visible at the bottom right of the dialog.

Implementation – Data Display



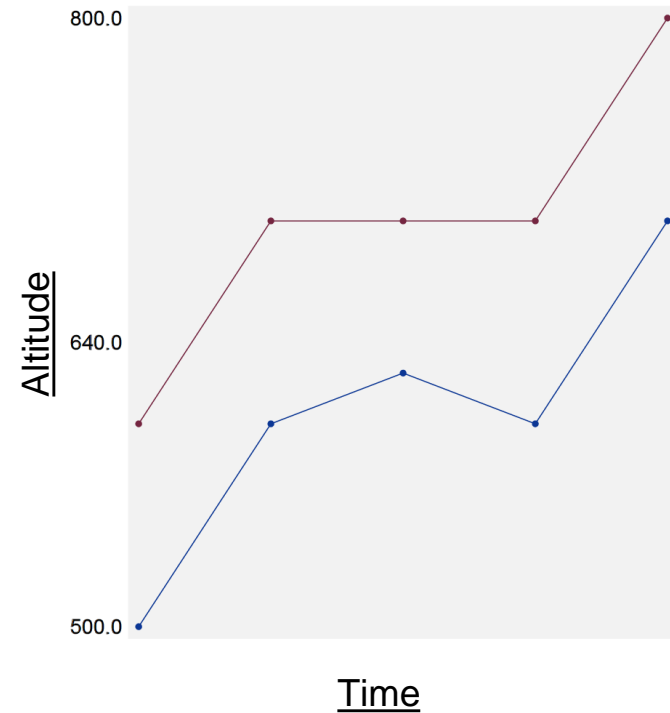
SOAR Dashboard

Enroll into Course

View Course

Upload Progress

■ Your Altitude
■ Expected





Testing

Testing – Overview

- Unit testing
- Integration testing
- Usability testing

Testing – Unit & Integration Testing

- Main components

- Parsing
- Display

Testing – Usability

- Use cases
- User surveys
- User task analysis

Testing - Use Cases

○ Methodology

- Set tasks
- Expected vs. actual results
- Log discrepancies

Type	Description	Expected	Pass?	Notes
Register	User chooses to register with no entries	Inform user of missing fields	Yes/No	Only informs user of first fill-in that is empty
Register	User chooses to register with a single missing entry	Inform user of missing fields	Yes	N/A

Testing - User Surveys

○ Methodology

- Get user feedback
- Analyze reoccurring opinions

	<i>Strongly disagree</i>				<i>Strongly agree</i>
<i>Navigating the application is easy</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Testing - User Task Analysis

○ Methodology

- Measure user performance
- Expected vs. actual results

Type	Expected	Actual	Clicks	Pass	User Type
Register	< 2 minutes	1 minute 26 seconds	23	Yes	Experienced
Login	< 30 seconds	17 seconds	7	Yes	Experienced



Challenges and Risks

Overall Challenges

- Lack of access to flight simulator
- No knowledge of aviation principles
- Co-development of products

Risks

Risk	Likelihood	Severity	Mitigation
Data loss	Low/Moderate	High	Daily backups
Bad XML file	Low	Moderate	Capture error and report to developer
Inaccurate reporting	Low/Moderate	High	Unit testing

Future Work

- More visualizations of data
- Theme changing for different institutions
- Payment options

Conclusion

- Sponsor wants to monetize aviation training
- We create the bridge between training and improvement based on analysis
- Empowering students to succeed in aviation



Thank you

Questions and Comments