Team 304: AR Training Application

Sponsored by Florida Power & Light

Alexis Cross, Christopher Sopeju, Kaitlyn Gurtner, Kevin Rodriguez & Max Urscheler

Team Introduction

Alexis Cross

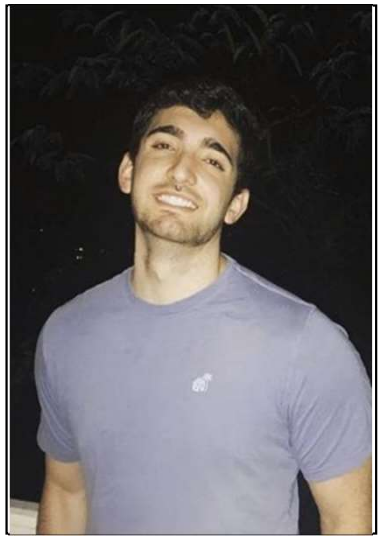
Technical Specialist

Christopher Sopeju

Lead Programmer

Kaitlyn Gurtner

Team Leader



Kevin Rodriguez

Lead Designer

Max Urscheler

Test Engineer

Outline

- Project Background
- Project Scope
- Customer Needs & Requirements
- Functional Decomposition
- Project Management

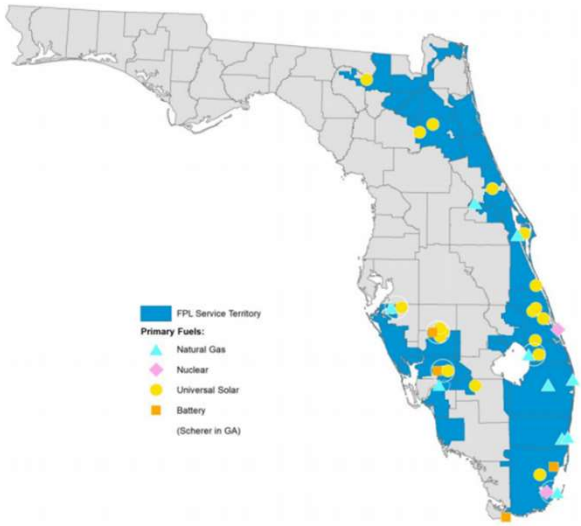
Project Background

Sponsor & Advisor, Objective, and Background Information

Sponsor – Florida Power & Light

Subsidiary of NextEra Energy Inc.

Responsible for millions of people's electricity in the state of Florida.



Project Liaisons

Florida Power & Light

- Genese Augustin
  - Lead Project Manager
  - Smart Grid & Innovation
- Troy Lewis
  - Engineer II
  - Smart Grid & Innovation

Faculty Advisor

- Reginald Perry, Ph.D.

Objective & Motivation

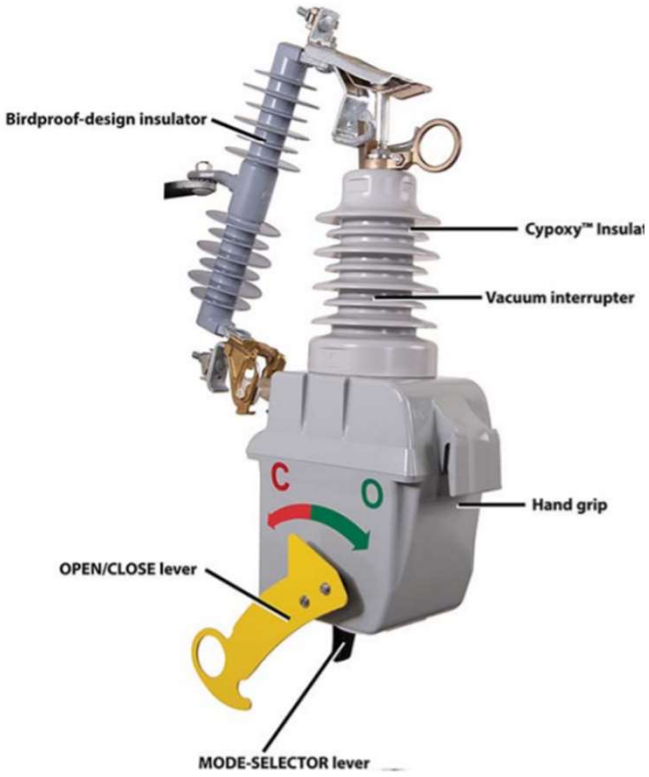
The objective of this project is to design an application that will virtually train Florida Power & Light (FPL) employees on maintenance and troubleshooting procedures for the Automatic Transformer Switch (ATS).

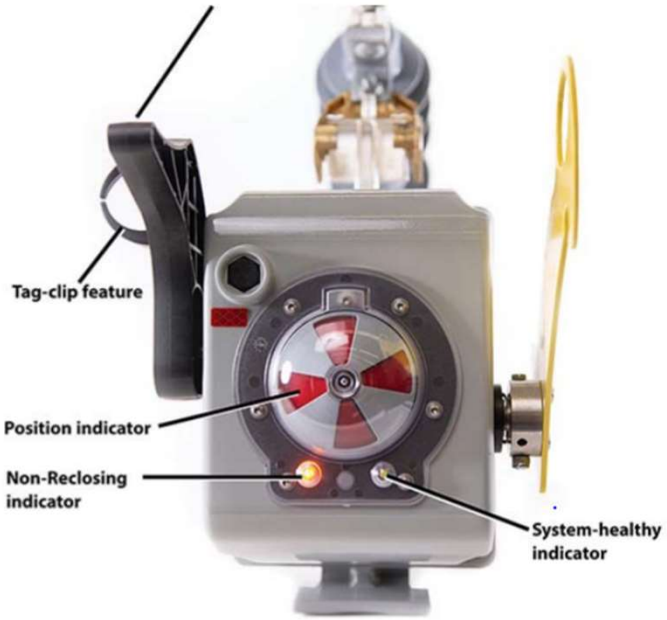
The COVID-19 pandemic is the key motivator in creating this application to provide virtual training, thus limiting potential spread of the disease.

Background Information -
Automatic Transformer Switch (ATS)

- The purpose is to ensure the continuous delivery of electrical power

- Manual Operating Lever
- Non-Reclose Lever
- Position Indicator Semaphore
- System Healthy LED
- Non-Reclosing LED





Kaitlyn Gurtner

ATS Operation - Training Procedures

- Normal In-Service Operation
- Operation During Permanent Fault
- Operation During Temporary Fault
- Non-Reclose Lever Operation
- Manual Open Procedure
- Manual Close
- Troubleshooting

Kaitlyn Gurtner

Project Scope

Key Goals, Markets, Assumptions, and Stakeholders

Key Goals

- Train and Test FPL Employees on ATS Maintenance
- Deploy via Virtual Platform
- User-Friendly
- Intuitive

Markets

- Primary Market
  - Florida Power & Light Employees
- Secondary Markets
  - Vocational/Technical Schools
  - Employees of Other Electric/Utility Companies
  - Automatic Transformer Switch Manufacturers
  - Manufacturers of Similar Power Equipment

Stakeholders & Assumptions

Stakeholders

- Genese Augustin
- Troy Lewis
- FPL Employees

End User Assumptions

- Experience with Electrical Components
- Familiarity with ATS

Customer Needs & Requirements

Customer Statement

Due to the COVID-19 pandemic, Florida Power & Light (FPL) desires an application that will virtually educate and train its employees on how to perform maintenance on an Automatic Transformer Switch (ATS). In order to give employees access to the final product, the application must be compatible with the FPL internal application store.

Customer Statement – Q&A

Questions

- Train on installation, maintenance or both?
- Augmented or virtual reality?
- More than just simulating maintenance?
- Specifically for iPad?
- Required production method?

Answers

- Maintenance only, employees know how to install
- Neither, rather a simulation
- Include portions to educate and assess knowledge
- Yes, must be iPad compatible
- No, any method acceptable

Alexis Cross

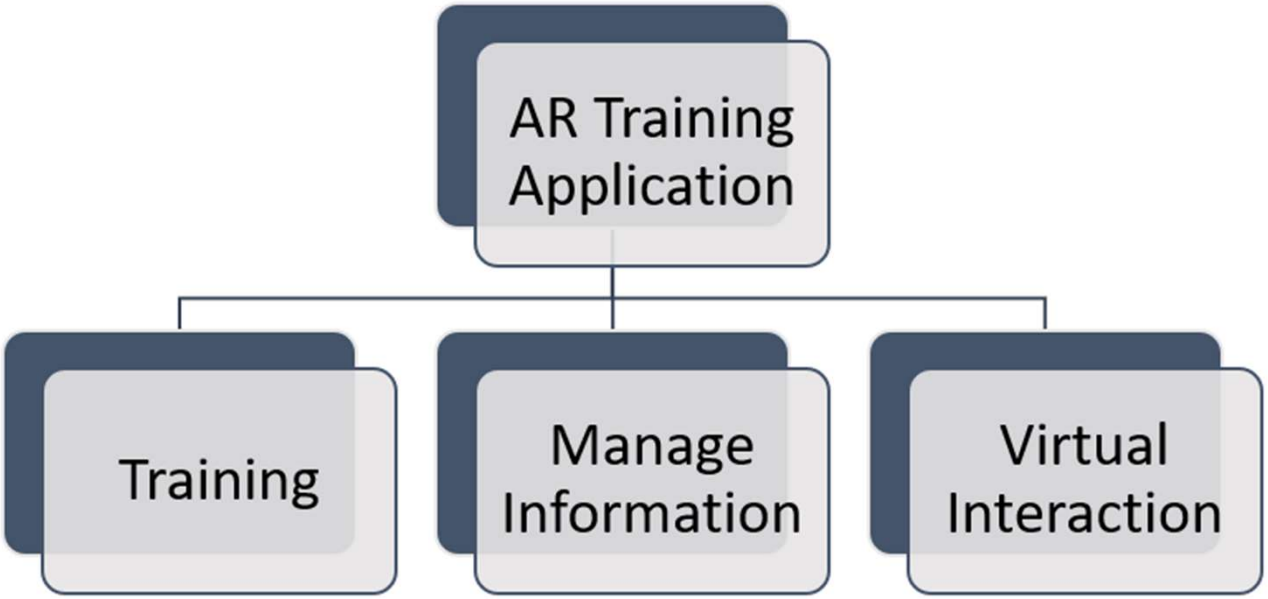
Customer Needs

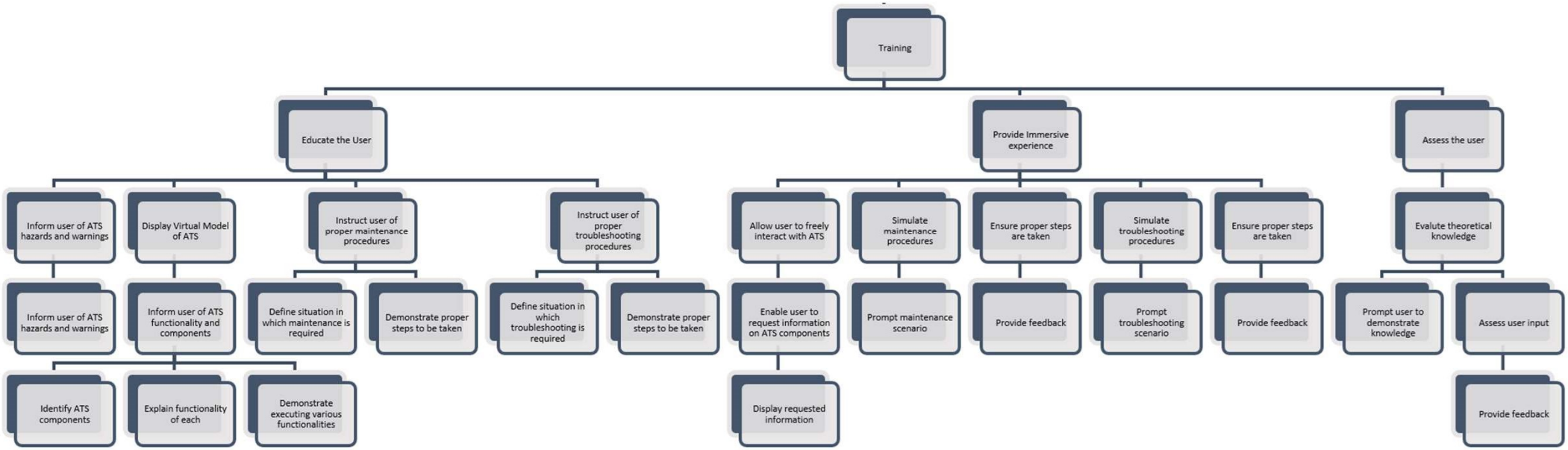
Identifier	Need	Source
N1	Train FPL employees on ATS maintenance procedures	Cust.
N2	Conduct training in a virtual manner	Cust.
N3	User-friendly/intuitive	Cust.
N4	Interactive experience	Cust.
N5	Easily distributed among FPL employees	Cust.

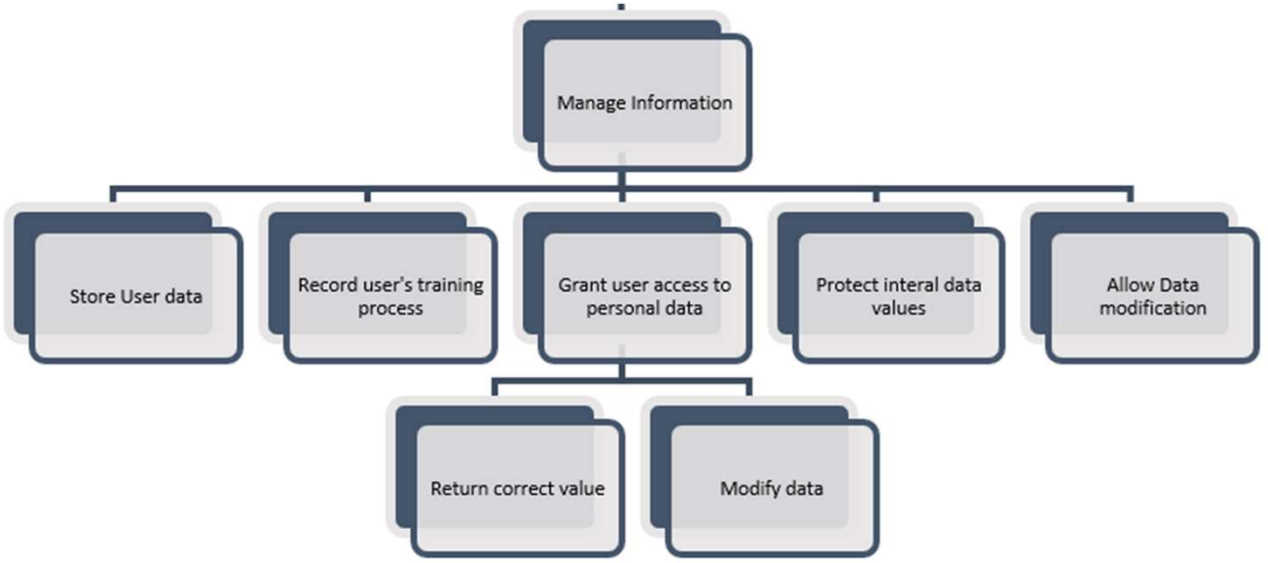
Customer Requirements

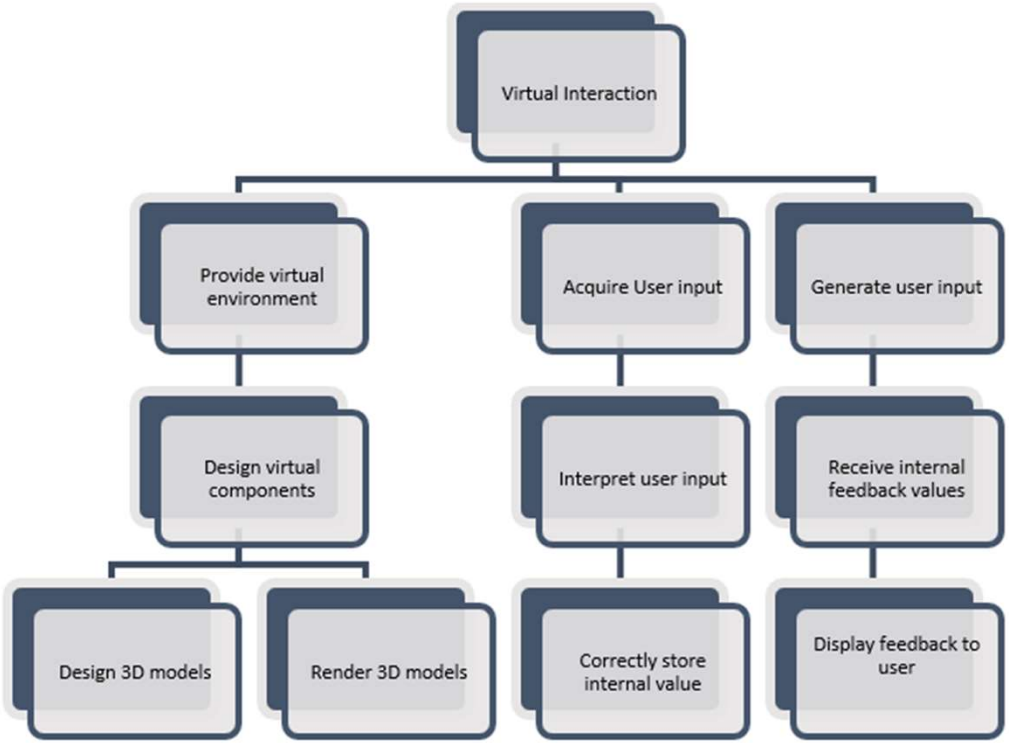
Identifier	Requirement	Need(s) Met
R1	Educate on ATS components and their functions	N1
R2	Educate on ATS maintenance & troubleshooting procedures	N1
R3	Final design is an iPad application	N2, N3, N5
R4	Simulate ATS maintenance & troubleshooting procedures	N1, N2, N3, N4
R5	Assess the user's knowledge & provide feedback	N1, N4
R6	Provide feedback during simulations and assessments	N1, N3, N4
R7	Simulation behaves and appears like real life experience	N1, N3, N4
R8	Allow user to freely interact with ATS	N1, N2, N3, N4
R9	Enable user to request information on ATS components	N1, N2, N3, N4
R10	Demonstrate opening and closing of switch procedures	N1, N2, N3, N4

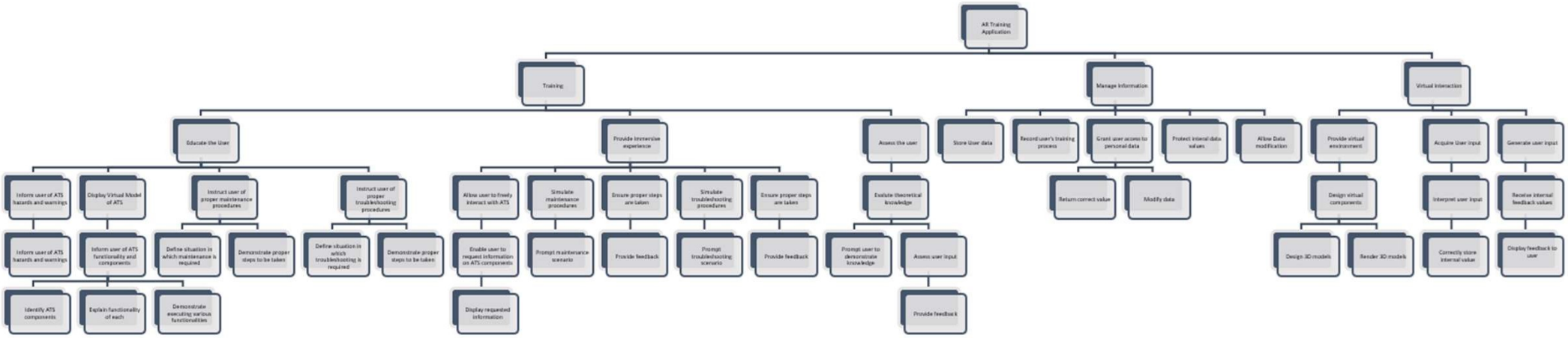
Functional Decomposition


AR Training Application
Training
Manage Information
Virtual Interaction


Training
Educate the User
Provide Immersive experience
Assess the user
Inform user of ATS hazards and warnings
Display Virtual Model of ATS
Instruct user of proper maintenance procedures
Instruct user of proper troubleshooting procedures
Allow user to freely interact with ATS
Simulate maintenance procedures
Ensure proper steps are taken
Simulate troubleshooting procedures
Ensure proper steps are taken
Evalute theoretical knowledge
Inform user of ATS hazards and warnings
Inform user of ATS functionality and components
Define situation in which maintenance is required
Demonstrate proper steps to be taken
Define situation in which troubleshooting is required
Demonstrate proper steps to be taken
Enable user to request information on ATS components
Prompt maintenance scenario
Provide feedback
Prompt troubleshooting scenario
Provide feedback
Prompt user to demonstrate knowledge
Assess user input
Identify ATS components
Explain functionality of each
Demonstrate executing various functionalities
Display requested information
Provide feedback


Manage Information
Store User data
Record user's training process
Grant user access to personal data
Protect interal data values
Allow Data modification
Return correct value
Modify data


Virtual Interaction
Provide virtual environment
Acquire User input
Generate user input
Design virtual components
Interpret user input
Receive internal feedback values
Design 3D models
Render 3D models
Correctly store internal value
Display feedback to user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Render 3D models
Correctly store internal value
Display feedback to user
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Explain functionality of each
Demonstrate executing various functionalities
Display requested information
Provide feedback

Additional Targets

- Targets not directly asked from us by the customer.
- Generated from ATS instructional/informational manual
- Also obtained from ATS video supplied from FPL
- Needs to conform to software design practices

Project Management

Project Organization

- Advisor Meetings: Fridays at 12:00 P.M.
- Sponsor Meetings: Fridays at 1:00 P.M.

- Communication: Text Messaging, Zoom, Webex, Git, & Google Drive

Work Breakdown Structure

- Assignments for Class
- Familiarization of Unity
- Background Research
- 3D Modeling
- Begin Application Development

Summary

- Design a Training Application
- Create a Virtual ATS
- Satisfy Customer Needs
- Fulfill Customers Wants in Reason
- Produce a User Friendly Training Experience

Questions?