MICHIGAN STATE UNIVERSITY

# 01/28: Team Status Reports

## The Capstone Experience

Dr. Wayne Dyksen
James Mariani
Luke Sperling
Griffin Klevering
Sam Kessel

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Spring 2025

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# Status Report Presentation

## AI System Testing Framework

### The Capstone Experience


Team Ally

Andrew Dagher
Ethan Gomez
Vu Ho
Gabe Moraru
Michael Plante
Amit Wagh

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# Team Ally

## Status Report

[1 of 4]

## AI System Testing Framework

- Sponsor Overview
  - Online Banking & Financial Services Company
  - Provides Wide Array of Banking, Lending, and Investment Services
  - Seeking to Utilize AI & ML to Automate Business Processes
- Project Overview
  - Evaluation Framework & Tools for Evaluating GenAI Uses
  - Helps Evaluate GenAI Performance & Identify Risks
  - Will Be Used Internally
  - Provides Guidance for Decisions About GenAI Automation

# Team Ally

## Status Report

[2 of 4]

## AI System Testing Framework

- Server Systems / Software
  - Local Database for Testing Set Up, Still Working on Server Setup
  - Small Amount of Synthetic Data Generated
  - Data Validity Confirmed With Client
- Development Systems / Software
  - GitLab, Lab PCs, & Local Environments Set Up
  - Prototype UI Delivered to Client & First Draft of UI Nearly Finished
  - LLM API Testing in Progress
- Project Plan Document
  - Document in Early Stages
  - Basic Schedule Outlined
  - 10% Complete

# Team Ally

## Status Report

[3 of 4]

## AI System Testing Framework

- Client Contact
  - Met With Client Twice
  - Recurring Meetings 11AM on Fridays
- Team Meetings
  - After Every Course/Sponsor Meeting
  - Additional Meetings If Necessary
- Team Organization
  - UI Designer & 2 Database Designers
  - Other 3 Members Developing Backend Functionality

# Team Ally

## Status Report

[4 of 4]

## AI System Testing Framework

Risks

- Backend/Frontend/DB Integration
  - Issues May Arise from Incorrectly Linking Parts of Program Architecture
  - Close Collaboration Between Teams & Link Architecture Components Early
- Database Hosting & Performance Bottlenecks
  - Hosting Database and Reducing Bottlenecks May Prove Difficult
  - Host Database ASAP & Optimize for High Data Volumes
- Noise Handling
  - Noisy Inputs & Outputs Need to Be Handled Appropriately
  - Testing Various Prompts, Adjusting Parameters, & Adding Error Handling System
- Model Training
  - Training Model May Prove Difficult & Computationally Intensive Given Our Resources
  - Fine Tuning Instead of Training, Use Smaller But Diverse Training Set

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# Status Report Presentation

## Semantic Search for Code and Architecture Assets

## The Capstone Experience


### Team Amazon

Jerry Chen
Nicholas Li
Atharva Kirkole
Sampan Chaudhuri
Zayd Abualfellat

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# Team Amazon

## Status Report

[1 of 4]

### Semantic Search for Code and Architecture Assets

- Sponsor Overview
  - E-commerce platform
  - Product delivery service
  - Offers web service technologies
- Project Overview
  - Searching for relevant code snippets using natural language queries
  - Eliminates navigating through codebases
  - Eliminates file sharing through multiple platforms
  - Used by Amazon developers

# Team Amazon

## Status Report

[2 of 4]

### Semantic Search for Code and Architecture Assets

- Server Systems / Software
  - AWS account with technologies has been set up
  - Gitlab has been set up
  - Windows VM has been set up
- Development Systems / Software
  - Website will use React for front-end
  - API Gateway and Lambda workflow for back-end
  - AWS OpenSearch and Bedrock for vector database embeddings
- Project Plan Document
  - Created rough draft of architecture diagram
  - Created a template and assigned tasks
  - 15% Complete

# Team Amazon

## Status Report

[3 of 4]

### Semantic Search for Code and Architecture Assets

- Client Contact
  - Set up weekly meetings on Fridays 3-4 pm
  - Have had 2 meetings and AWS Skills Training
- Team Meetings
  - Set up weekly meetings on Mondays at 5:30 pm
  - Have met 4 times
- Team Organization
  - Front-end: Sampan and Nicholas
  - Back-end: Zayd, Jerry, and Atharva

# Team Amazon

## Status Report

[4 of 4]

### Semantic Search for Code and Architecture Assets

Risks

- Exceeding AWS budget
  - Using Amazon services can have an associated cost
  - Ensuring system is optimized with integrated AWS services
- Exceeding rate limits for LLM usage
  - Rate limits occur with quick, consecutive calls to APIs
  - Discuss strategies with client during budget meeting
- Using AWS OpenSearch vs AWS RDS
  - Both technologies can be used for vector search but have cost concerns
  - Identify pros and cons with client during weekly sync
- Connecting front-end to back-end seamlessly
  - How to send LLM-generated data from back-end to front-end
  - Research API Gateway and Amplify solutions

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# Status Report Presentation

## Energy Market Evaluation

### The Capstone Experience


Team Anthropocene Institute

Austin Blackwell
Hayden Cheney
Jaden Shah
Owen Lenkiewicz
Aarav Kalpesh Desai
Xinyu Tian

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# Team Anthropocene Institute

## Status Report

[1 of 4]

## Energy Market Evaluation

- Sponsor Overview
  - Anthropocene Institute is a non-profit organization located in Palo Alto, California
  - They unite entrepreneurs, thought leaders, and investors to advance clean energy technology and climate policy
  - Primary goal is to solve the climate disruption dilemma by 2030 by investing in and advancing the right science and technology
- Project Overview
  - Available to the public
  - Visualize trends in the energy market with external factors including: natural disasters, plants shutting down, weather, etc…
  - Look at where nuclear energy could be better used to supply power to the grid
  - Ability to extract data in the form of simple files such as: csv, txt, excel, etc…

# Team Anthropocene Institute

## Status Report

[2 of 4]

## Energy Market Evaluation

- Server Systems / Software
  - Vmware Fusion is set up and running
  - Gitlab is set up
- Development Systems / Software
  - We have a “Hello, world!” Flask application running on localhost pushed to main in our Gitlab
  - We all have VS Code or Webstorm set up to run from the GitLab on our computers
- Project Plan Document
  - We are still in discussion with our client on what the project should be and what data we need to use
  - Created a basic skeleton for our project plan document
  - 10% Complete

# Team Anthropocene Institute

## Status Report

[3 of 4]

### Energy Market Evaluation

- Client Contact
  - We have had two meetings so far with our client contact
  - Weekly meetings are scheduled every Tuesday at 7:15pm
- Team Meetings
  - We meet in-person twice a week in the lab after all-hands meetings usually
  - Other communication is done through Microsoft Teams
- Team Organization
  - Jaden is the primary client contact
  - All working on basic code, research, and requirement refining

# Team Anthropocene Institute

## Status Report

[4 of 4]

## Energy Market Evaluation

Risks

- Data processing
  - Loading, combining, and connecting different data sources of varying formats
  - Practice loading sample data files in Python and experimenting with different libraries
- Creating an API
  - Creating an API that our client can connect to
  - Discuss with client and research connecting flask-restful to our application
- Understanding the energy market
  - Different types of energy and their cost and use in the grid is difficult to understand
  - Individual research and through discussion with client
- Visualizing real time data
  - Maintaining real time data from the California Independent System Operator
  - Integrate socketio into our basic Flask application

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# Status Report Presentation

## Auto-Owners Talent Management

### The Capstone Experience


Team Auto-Owners

Aleksander Russa
Jacquelyn Nehra
Bhaaniu Jain
Briana Hill
Jason Janz

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# Team Auto-Owners

## Status Report

[1 of 4]

## Talent Management Portal

- Sponsor Overview
  - Auto-Owners Insurance is rated A+ (Superior) by AM Best and is a Fortune 500 company
  - The company is represented by 48,000 licensed agents in 26 states
- Project Overview
  - Streamline the talent management process
  - Provide an intuitive interface for their HR team
  - Identify associates who are ready for future leadership roles
  - Categorize associates based on certain qualifications and ability to relocate

# Team Auto-Owners

## Status Report

[2 of 4]

## Talent Management Portal

- Server Systems / Software
  - Discuss with customer options for web hosting
  - Microsoft SQL – “Hello World”
- Development Systems / Software
  - Gitlab repo set up, necessary members added
  - Base Angular page instantiated
  - Spring Boot – Researching implementation for our needs
- Project Plan Document
  - Several mockups have been created
  - Gathering project details
  - 25% Complete

# Team Auto-Owners

## Status Report

[3 of 4]

## Talent Management Portal

- Client Contact
  - In contact with AO team
  - Weekly meetings Friday from 11am-12pm
  - Scheduling in person meeting / on-site visit TBD
- Team Meetings
  - Have met four times
  - Meet Wednesdays weekly, when necessary Thursdays after triage
- Team Organization
  - Trello board for planning and sprint management
  - Current roles vary based on active sprint

# Team Auto-Owners

## Status Report

[4 of 4]

## Talent Management Portal

Risks

- Hosting
  - Figure out how we are going to host end service
  - Discuss with customer and course staff
- Use of AI
  - We need to implement AI to work on a task, very open ended
  - Discuss what tasks we think AI could be beneficial too for this tool
- Microsoft SQL Server
  - We are all unfamiliar with this version on SQL
  - Testing a starter project locally and linking it with other software
- Coupling SQL with Angular frontend using Spring Boot + REST APIs
  - We are familiar with these softwares individually but need to learn how to pair them
  - Research compatibility to ensure there are no issues down the line

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# Status Report Presentation

## AI for Med Students Learning About Basket Management (AIM-LAB)

## The Capstone Experience


Team Corewell

Julian Akkashian
Pradyumna Karyamapudi
Shaheer Khan
Daphne Martin
Christopher Nguyen
Isaac Zelenak

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# Team Corewell

## Status Report

[1 of 4]

## AIM-LAB

- Sponsor Overview
  - Network of Hospitals and Doctors
  - Locations across Michigan
  - Health, Humanity, Hope
- Project Overview
  - Improve Basket Management Training in EHR System
  - Used by Medical Students and Instructors
  - Curriculum Involves Daily Assignments
  - AI Provides Feedback to Student Responses

# Team Corewell

## Status Report

[2 of 4]

### AIM-LAB

- Server Systems / Software
  - Using Vercel & Railway for hosting, OpenAI for LLM
  - Backend, Database, and Frontend are connected
- Development Systems / Software
  - React for Frontend
  - Golang for Backend
  - Flask for LLM Microservice
  - Supabase for Database
- Project Plan Document
  - In Progress
  - Company Description Complete
  - Document 5% Complete

# Team Corewell

## Status Report

[3 of 4]

### AIM-LAB

- Client Contact
  - Weekly Thursday Conference Call over Teams
  - Two Meetings so far
- Team Meetings
  - At Least every Wednesday after Triage
  - Four meetings so far
- Team Organization
  - Frontend – Julian and Isaac
  - Backend and Database – Shaheer and Christopher
  - LLM Microservice– Daphne and Pradyumna

# Team Corewell

## Status Report

[4 of 4]

## AIM-LAB

Risks

- Risk 1
  - Restricted Access to MIMIC-III Database
  - Get Access or Find Alternative Data
- Risk 2
  - Restricted Access to Med-PaLM LLM
  - Switch to OpenAI or other LLM
- Risk 3
  - Accurate Testing of LLM Medical Information
  - Loop In Project Sponsors or Relatives in Medical Industry
- Risk 4
  - Cost-Friendly MSU Just In Time (JIT) Web Hosting Compatability
  - Present Sponsors with Options and Cost Breakdowns

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# Status Report Presentation
# 3D Analysis of Dental Patient History

## The Capstone Experience

### Team Delta Dental 3DADPH

Jacob Robson
Lance Stemple
Jasen Van Acker
Sanju Kona
Ben Crimmins
Thomas Toaz

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# Team Delta Dental 3DADPH

## Status Report

[1 of 4]

### 3D Analysis of Dental Patient History

- Sponsor Overview
  - Dental insurance provider
  - Process millions of claims a year
  - Headquartered in Chicago, IL
- Project Overview
  - Interactive 3D dental model
  - Insurance adjudicators use to
    - Visualize patient history
    - Determines if claims are valid
    - Saves time for claim adjudication

# Team Delta Dental 3DADPH

## Status Report

[2 of 4]

### 3D Analysis of Dental Patient History

- Server Systems / Software
  - DECS Linux Virtual Machine
- Development Systems / Software
  - Quarkus is setup, postgres is hosted
  - Angular is displaying temporary model
  - We received the sample data
- Project Plan Document
  - We have our first wireframe
  - Architecture diagram is complete
  - 25% Complete

# Team Delta Dental 3DADPH

## Status Report

[3 of 4]

### 3D Analysis of Dental Patient History

- Client Contact
  - Met with client twice already
  - Each Friday at 3:00pm
- Team Meetings
  - Met seven times
  - Mondays at 5:40
- Team Organization
  - GitLab board
  - Communicate through groupchats

# Team 3DADPH

## Status Report

[4 of 4]

## 3D Analysis of Dental Patient History

Risks

- 3D Modeling Teeth
  - Many different tooth operations and how we should model them
  - Speak to client and look for existing examples
- Detail of the model
  - The model must be detailed enough for adjudicators to use
  - Create various models and present to users/sponsors
- In-Site performance
  - Displaying models efficiently and many device types may use
  - Optimize our web page and load essential services only

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# Status Report Presentation

## Domain-Specific Language Tooling Ecosystem

## The Capstone Experience

### Team Delta Dental dSLATE

Jude Hansen
Joseph Hughes
David Wells
Henry Greer
Antonio Capozzoli
Mitchell Ballinger

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# Team Delta Dental dSLATE

## Status Report

[1 of 4]

## DSL Tooling Ecosystem

- Sponsor Overview
  - Nation’s leading provider of dental insurance
  - Offers coverage across all 50 states
  - Provides insurance for both companies and individuals
- Project Overview
  - Existing Domain Specific Language for rate calculation
  - Lacks development support
  - Comprehensive development environment will be created
  - Will be used by developers and underwriters

# Team Delta Dental dSLATE

## Status Report

[2 of 4]

## DSL Tooling Ecosystem

- Server Systems / Software
  - Test database created with MongoDB
- Development Systems / Software
  - Angular prototype created
  - Gitlab shared with clients to access previous projects
  - Test OpenAI API and Claude API call created
- Project Plan Document
  - Project plan document and presentation started
  - Document structure, executive summary, and schedule partially complete
  - 10% Complete

# Team Delta Dental dSLATE

## Status Report

[3 of 4]

### DSL Tooling Ecosystem

- Client Contact
  - Met and established main lines of communication
  - Weekly meetings scheduled on Fridays
- Team Meetings
  - Team meetings scheduled on Wednesdays and Fridays
  - Will possibly meet more days of the week as work progresses
- Team Organization
  - Frontend: Joseph, Jude, Antonio
  - Backend and AI: Henry, David, Mitchell

# Team Delta Dental dSLATE

## Status Report

[4 of 4]

## DSL Tooling Ecosystem

Risks

- Risk 1
  - Development of AI assistant with low amounts of training data
  - Using prompt engineering which does not require vast amounts of data
- Risk 2
  - User-friendly conversion of UI interactions to DSL
  - Breaking down complex data into step-by-step user interactions
- Risk 3
  - Availability of field-testing on userbase
  - Testing on non-employees if real users are not available
- Risk 4
  - Integration of previously developed Capstone projects
  - Testing features from previous applications within our new application

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# Status Report Presentation

## Global Waste Management System

### The Capstone Experience


Team GM

Joseph Khalaf

Hassan Maklai

Ben Blanchard

Manh Tran

Nathan Shammami

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# Team GM

## Status Report

[1 of 4]

## Global Waste Management System

- Sponsor Overview
  - Designs, builds, and sells cars, trucks, crossovers, and automobile parts globally.
  - Encompasses brands such as Chevrolet, Buick, GMC, and Cadillac.
  - Aiming for zero crashes, emissions, and congestion.
- Project Overview
  - Web application for detecting anomalies in GM's waste data.
  - Predict future data trends and analytics.
  - Used by enviornmental engineers at GM's manufacuring plants.

# Team GM

## Status Report

[2 of 4]

## Global Waste Management System

- Server Systems / Software
  - Web Server—Live but not tested.
  - Database—Live but not tested.
- Development Systems / Software
  - Web Page—Designed but not implemented.
  - Anomaly Detection AI—Actively researching.
  - Waste Data Analytics—Actively researching.
- Project Plan Document
  - We have finished but not revised most sections of the project plan, including the executive summary, functional specifications, technical specifications, stretch goals, and risk analysis.
  - Screen mock-ups are created but not finalized.
  - 60% Complete

# Team GM

## Status Report

[3 of 4]

## Global Waste Management System

- Client Contact
  - Weekly meetings Friday at 3:00pm.
  - Discussed how the top-level design should function and look.
- Team Meetings
  - In-person weekly meetings on Tuesday at 4:30pm.
  - We have met 5 times already.
- Team Organization
  - Hassan is creating the front end.
  - Nathan and Ben setting up database and preprocessing data.
  - Joe and Manh designing algorithms for anomaly detection and future predictions.

# Team GM

## Status Report

[4 of 4]

## Global Waste Management System

Risks

- Data Preprocessing
  - GM's data contains limited numeric values, and optional categories are often incomplete, hindering statistical anomaly detection.
  - We will convert repetitive strings to numeric codes, drop less useful categories, and validate data to improve usability.
- Future Waste Predictions
  - This AI should highlight important trends that GM Waste Managers should know about and filter out less useful information.
  - Use statistical analysis methods such as growth curve analysis to determine if there is a significant change in the trend of a dataset.
- User Interface
  - Display all anomalies to the user in an easy to use and meaningful way, while allowing users to change data based off anomalies.
  - Create and present iterations of user interfaces using feedback from GM sponsors who will use the application day to day.

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# Status Report Presentation

## Customer Intent Engine and Training Tool

## The Capstone Experience


### Team HAP

Abdulrahman Alanazi
Praneetha Ankisettipalli
Averey Davis
Bao Hoang
Saarthak Sharma
Karoline Yashin

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# Team HAP

## Status Report

[1 of 4]

## Customer Intent Engine and Training Tool

- Sponsor Overview
  - Nonprofit health insurance plan organization.
  - Located in Troy, Michigan.
  - Subsidiary of Henry Ford Health.
- Project Overview
  - Develop a web application for future customer service training purposes.
  - Categorize the intents of HAP's customer call transcripts.
  - Create an interactive graphical tool for accessible data visualization.
  - Assist customer representatives and virtual agents in determining intents.

# Team HAP

## Status Report

[2 of 4]

## Customer Intent Engine and Training Tool

- Server Systems / Software
  - Google Cloud Web Hosting for future deployment.
  - Window VM is installed in iMacs successfully.
  - Docker is employed as a containerization platform.
- Development Systems / Software
  - HTML, CSS, JavaScript, Python Flask.
  - Power BI, PostgreSQL.
  - OpenAI API or local LLMs like Llama.
- Project Plan Document
  - Downloaded document template.
  - Started the Figma and system architecture design.
  - 10% Complete.

# Team HAP

## Status Report

[3 of 4]

## Customer Intent Engine and Training Tool

- Client Contact
  - We have met with our clients twice so far.
  - We have established a weekly conference call at 3:30 PM on Fridays.
- Team Meetings
  - We have met six times so far.
  - Our team plans to meet on Tuesdays and Thursdays after class meetings.
- Team Organization
  - Front-end: Karoline.
  - Back-end: Saarthak.
  - ML/AI: Bao and Averey.
  - Data Analysis/Visualization: Praneetha and Abdulrahman.

# Team HAP

## Status Report

[4 of 4]

## Customer Intent Engine and Training Tool

Risks

- Unlabeled Dataset
  - The dataset is unlabeled.
  - We will manually label it or use a pre-trained model like GPT to generate labels.
- Noisy Transcripts
  - Some transcripts generated by Genesis software may not be accurate based on the user' call.
  - We will use context clues to determine intent or remove the noisy transcripts.
- Multiple Intents
  - The transcripts may contain multiple intents, so the AI model may be confused.
  - We will manually review the transcripts and specify which parts of the call correspond to different intents.
- Slow Inference Time
  - The AI model is large, so the inference time may be slow, which could negatively impact the user experience.
  - We will perform model optimization, such as quantization or pruning.

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# Status Report Presentation

## Henry Ford Innovations eLUG

## The Capstone Experience

### Electronic Laboratory User's Guide (eLUG) Modernization

Anushka Basani
Trevor Jacobs
Abhi Rao
Shreya Rudagi
Shreyas Sankar
Deenie Vichitpap

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# Team Henry Ford Innovations eLUG

## Status Report

[1 of 4]

### Electronic Laboratory User's Guide (eLUG) Modernization

- Sponsor Overview: Henry Ford Health
  - Top Healthcare System – Leading medical care and innovation in Michigan.
  - Cutting-Edge Research – Home to groundbreaking research in cancer, cardiology, and neuroscience, driving medical advancements.
  - Community-Driven – Focused on patient care, wellness, and accessibility.
- Project Overview
  - Modernize an electronic user guide with modern features to expedite patient treatment
  - Convert the System to a Web-based Structure
    - Facilitate Easy Sharing
    - Standardize Formats
  - Provide Mobile Applications
  - Pathology Department will use it

# Team Henry Ford Innovations eLUG

## Status Report

[2 of 4]

### Electronic Laboratory User's Guide (eLUG) Modernization

- Server Systems / Software
  - Docker
  - Have tested and looked around original website
  - Deploy server to host application
- Development Systems / Software
  - Created GitLab
  - HTML, CSS, React for web application, Xcode and Swift for mobile application
  - Clinisys and Microsoft SQL
- Project Plan Document
  - Started each of the topics baseline has been created
  - 40% Complete

# Team Henry Ford Innovations eLUG

## Status Report

[3 of 4]

### Electronic Laboratory User's Guide (eLUG) Modernization

- Client Contact
  - Met with client on 1/17, consistent email communication afterwards
  - Still waiting on pathology department for weekly meeting time
- Team Meetings
  - We've met every week on Tuesday's after the all-hands meeting
  - We also have extra meetings throughout the week if needed
- Team Organization
  - Anushka, Abhi, Shreyas- App Dev Team
  - Shreya, Deenie, Trevor- Web Dev Team

# Team Henry Ford Innovations eLUG

## Status Report

[4 of 4]

### Electronic Laboratory User's Guide (eLUG) Modernization

Risks

- Risk 1
  - Security – Data breaches
  - Restrict who can access and update the data
- Risk 2
  - Incorporation of Clinisys
  - Research Clinisys and how it is used in current eLUG
- Risk 3
  - eLUG automatically updates
  - Create a series of tests that will attempt to update website automatically
- Risk 4
  - Process of creating an IOS app
  - Research common app development IDEs and strategies for IOS applications

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# Status Report Presentation

## Modernizing Robotic-Surgery Education

### The Capstone Experience


Team Henry Ford Health – RSE

Caden Fisher
Miranda Gabbara
Hayden Hiller
Neha Kumar
Bryan Tran
Dylan Troyer

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# Team Henry Ford Health – RSE

## Status Report

[1 of 4]

## Modernizing Robotic-Surgery Education

- Sponsor Overview
  - Healthcare organization headquartered in Detroit, MI
  - Operates 46 medical centers, including five hospitals
  - Breakthroughs and innovations in robotic surgeries
- Project Overview
  - Digital Analysis Dashboard for Surgical Students
  - Evaluates progress and accuracy of students learning with surgical robotics
  - Expand dashboard to create an application for mobile devices
  - For Medical Professional assessing student performance

# Team Henry Ford Health – RSE

## Status Report

[2 of 4]

## Modernizing Robotic-Surgery Education

- Server Systems / Software
  - Cloud Server – Still Researching
  - SQL Server – Set Up & Running
  - Git Lab – Set Up
  - Windows VM – Set Up
- Development Systems / Software
  - Docker Container – Set Up & Running
  - PyTorch – Set Up, Needs further improvement
  - Flask – Set Up & Running
  - iOS Development – Still Researching
- Project Plan Document
  - Template created
  - Not much has been written yet (this week's major task)
  - 10-15% Complete

# Team Henry Ford Health – RSE

## Status Report

[3 of 4]

## Modernizing Robotic-Surgery Education

- Client Contact
  - We met with the education director and innovation team
  - We will meet with the surgeons and the full team on Fridays
- Team Meetings
  - Weekly lab meetings on Tuesday before class
  - Thursday lab meetings during sprints, Friday Triage meeting
- Team Organization
  - Front-End – Neha, Miranda
  - Back-End – Caden, Bryan
  - Mobile Development – Hayden, Dylan

# Team Henry Ford Health – RSE

## Status Report

[4 of 4]

## Modernizing Robotic-Surgery Education

Risks

- Converting From Power BI
  - Potentially changing PowerBI to a more dynamic data visualization tool without breaking the existing system
  - Explore new tools cautiously alongside PowerBI and ensure the functionality stays the same
- Lack of experience in creating iOS applications
  - Unsure about how to design iOS applications and how to execute them
  - Research different mobile application frameworks to best suit the client's needs
- Synchronizing data between mobile and desktop applications
  - Figure out a way to connect the existing Web SQL server to a mobile application
  - Research and prototype various ways and discuss with client
- No clear specifications for software features
  - Still need to discuss improvements and additional features that need to be made since the previous 1.0 version.
  - Prepare questions prior to meeting and ensure proper communication

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# Status Report Presentation

# MSU-HFH Research Synergy Vanguard Portal (RSVP) 2.0

## The Capstone Experience

### Team Henry Ford Innovations RSVP

Owen Nyenhuis
Spandana Kodali
Aaron Breese
Andriy Tryshnivskyy
Felipe Marques Allevato
Nika Ghasemi Barmi

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# Team Henry Ford Innovations RSVP

## Status Report

[1 of 4]

### MSU-HFH Research Synergy Vanguard Portal (RSVP) 2.0

- Sponsor Overview
  - Leading health care and medical services provider
  - Cutting-edge technology and research in the medical field
  - Promoting healthcare fairness through data analyzation
- Project Overview
  - Refine and Enhance original RVSP Platform
  - Collect and store info about researchers in scalable database
  - Connect capabilities of MSU with the clinical needs of HFH
  - Web/Mobile Application search portal used by MSU and HFH

# Team Henry Ford Innovations RSVP

## Status Report

[2 of 4]

### MSU-HFH Research Synergy Vanguard Portal (RSVP) 2.0

- Server Systems / Software
  - In need of a discussion with client on server location
  - Currently testing previous login system/database functionality
  - Last implementation is currently running on server rack
- Development Systems / Software
  - Gitlab has been set up
  - Front-end uses React/Back-end uses Elasticsearch(Researching)
  - Researching schemas for best organization of data
- Project Plan Document
  - Awaiting specific expectations from client
  - Creating mockups for proposed improvements
  - 5% Complete

# Team Henry Ford Innovations RSVP

## Status Report

[3 of 4]

### MSU-HFH Research Synergy Vanguard Portal (RSVP) 2.0

- Client Contact
  - Met with client once, they would like to meet in person too
  - Awaiting on client for weekly meetings
- Team Meetings
  - We have met three times
  - Meet weekly after class on Tuesdays
- Team Organization
  - Front-end(Js, React, Mobile): Spandana, Andriy, Owen
  - Back-end(Elasticsearch/Google BERT): Nika, Aaron, Felipe

# Team Henry Ford Innovations RSVP

## Status Report

[4 of 4]

### MSU-HFH Research Synergy Vanguard Portal (RSVP) 2.0

Risks

- Mobile Migration
  - Not much experience with moving data smoothly and securely to mobile
  - Discuss with client about data management prior to migration
- User Authentication System
  - Unsure of which way is best for user login authentication
  - Research popular methods used by MSU/HFH/other websites
- Organization of Scraped User Data + Scalability
  - Not sure how to fit previously scraped data into a scalable database
  - Plan out how much data we need to accrue for each user and find best fit
- Containerizing for server side
  - Unsure how to package service for both local HFH and public domains
  - Testing containerization in different environments and server locations

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# Status Report Presentation

## Everyday Agent

## The Capstone Experience

### Team Launch

Will Bray-Cotton
Deirdre Eusebi
Swabhan Katkoori
Gregory Lis
Anthony Oo
Palina Skakun

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Michigan State University

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# Team Launch

## Status Report

[1 of 4]

### Everyday Agent

- Sponsor Overview
  - Accelerator to guide ideas to long-term execution
  - Help deliver working software to innovative clients
  - Partners with top brands, like Ford and Jeep, to create impactful digital solutions
- Project Overview
  - Wearable device that keeps track of personal objects (ex. keys and wallet)
  - Helps the user remember item locations
  - Any person can use it
  - Worn on the chest or around the neck

# Team Launch

## Status Report

[2 of 4]

### Everyday Agent

- Server Systems / Software
  - Azure Speech to Text has been tested, waiting for API key
  - Azure Text to Speech has been tested, waiting for API key
  - Azure LLM needs to be incorporated, waiting for API key
- Development Systems / Software
  - SQLite Database has been set up and tested
  - Predictive Algorithm template has been created with Pytorch
  - Environment Mapping has been tested with Places205 model
- Project Plan Document
  - Project Plan draft will be sent off to client after class today (1/28)
  - Will revise and discuss changes with client on Friday (1/31)
  - 20% Complete

# Team Launch

## Status Report

[3 of 4]

### Everyday Agent

- Client Contact
  - Weekly client meeting on Fridays at 12pm
  - Met 2 times so far
- Team Meetings
  - Formal meetings Tues/ Thurs after class and when needed
  - Met 5 times so far
- Team Organization
  - Anthony (TTS), Deirdre (STT), Palina (NLP & Client Contact)
  - Will (Environment Mapping), Gregory (Databases), Swabhan (Predictive Algorithm)

# Team Launch

## Status Report

[4 of 4]

## Everyday Agent

Risks

- Raspberry Pi Hardware Constraints
  - Battery life and processing power
  - Optimize everything and keep the software light
- Object Detection Accuracy
  - How to keep track of items/ what if the item isn’t clearly visible
  - Testing multiple AI models and implement post processing
- Natural Language Processing for Queries
  - Understanding complex, user-specific queries requires advanced intent recognition and context handling
  - Use LLMs for advanced NLP and validate results with a test suite of queries
- Physical Durability
  - Creating a device that is durable enough to withstand everyday wear and tear
  - Test out different combinations of materials and designs for cases

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# Magna Status Report Presentation

## The Capstone Experience


### Team Magna

Allen Shi
Charlie Cicchella
Kaustubh Siriki
Zoom Nguyen
Tim Bodholt
Eli Gudeman

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Michigan State University


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# Team Magna

## Status Report

[1 of 4]

## Manufacturing Tracking System

- Magna Overview
  - Designs and manufactures automotive components and systems
  - Develops EV and autonomous driving technologies
  - Operates globally with partnerships across the auto industry
- Project Overview
  - Enhances transparency and traceability in manufactoring using distributed ledger technology
  - Tracks material flow, quality metrics, and operational parameters in real time
  - Provides factory operators with a user-friendly tool for monitoring and decision-making.

# Team Magna

## Status Report

[2 of 4]

## Manufacturing Tracking System

- Server Systems / Software
  - Hyperledger Fabric – set up in progress
  - Docker – set up in progress
  - Ubuntu Server – Set up and ready
- Development Systems / Software
  - VueJS – Basic application up
  - NodeJS – basic implementation set up
  - Golang – basic implementation to access blockchain
- Project Plan Document
  - Document Created
  - Skeleton for document is completed
  - 10% Complete

# Team Magna

## Status Report

[3 of 4]

## Manufacturing Tracking System

- Client Contact
  - Regular scheduled meetings once a week
  - Have not scheduled in person, they are located in Ohio
  - Regular email contact throughout the week
- Team Meetings
  - Team meetings are scheduled once a week
  - Very productive discussing things we need to bring to sponsor's attention
- Team Organization
  - We have a general idea of who is specializing in what
  - It is important for us to ensure everyone works on each part of the project so we can learn

# Team Magna

## Status Report

[4 of 4]

## Manufacturing Tracking System

Risks

- Risk 1
  - Integrating a accurate and robust private Hyperledger blockchain
  - Intensive research, ask questions, and test
- Risk 2
  - Integrating current Magna services and software to work seamlessly with our application
  - Testing and communication with project sponsor
- Risk 3
  - Creating a UI that works for all users (factory workers, analysts, managers, leadership)
  - When working on the UI, there may be things we think are intuitive, but is not to a new user. We need to allow ample time for testing
- Risk 4
  - Dealing with incoming incomplete input data from factories
  - We need to catch anomalous data and potentially fill in data while keeping an authentic audit trail

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# Status Report Presentation

## Vulnerability Scan and Detect

### The Capstone Experience


Team McKesson

Ananya Chittineni
John Bannon
Nicholas Felarca
Brady Johnson
Demetrius Wilson
Chris Nguyen

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Michigan State University


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# Team McKesson

## Status Report

[1 of 4]

## Vulnerability Scan and Detect

- Sponsor Overview
  - Nations largest pharmaceutical company
  - Fortune #9 company
  - Delivers a third of all pharmaceutical products used or consumed in North America
- Project Overview
  - Website vulnerability scanner that detects web application security risks
  - Scans, records, and exports vulnerability information to a database
  - Capture and visualize vulnerabilities in a web application
  - Internal tool used to validate and maintain existing company web applications

# Team McKesson

## Status Report

[2 of 4]

## Vulnerability Scan and Detect

- Server Systems / Software
  - Docker container created and running locally
  - Utilizing MSU server to host web application
  - MySQL database server initial version established
- Development Systems / Software
  - Chose OWASP ZAP to be our main vulnerability detection software
  - BURP Suite Community researched implementation opportunities
  - Basic GitLab CI/CD pipelines have been successfully built, tested, and deployed
  - Python/Flask website template created
- Project Plan Document
  - Created a rough draft of project plan documents
  - Document template has been created, and we started using Figma to create mockups
  - 15% Complete

# Team McKesson

## Status Report

[3 of 4]

## Vulnerability Scan and Detect

- Client Contact
  - Met with client and scheduled weekly conference meetings for Mondays 4:15PM-5:00PM
  - Currently establishing project requirements and features
- Team Meetings
  - Established weekly team meetings to be Wednesdays 5:00PM
  - Team has met four times since the team's inception
- Team Organization
  - Split the group into three teams: front-end, back-end, and CI/CD tooling
  - Utilizing Trello boards to split weekly tasks and to promote agile development

# Team McKesson

## Status Report

[4 of 4]

## Vulnerability Scan and Detect

Risks

- Website authentication
  - Establishing a layered authentication
  - Create multiple users in the backend with multiple layers of privilege
- Persistent database
  - Server that can accessed through several channels
  - Allow the database to accessed through simple MySQL commands
- Server to host web application
  - Fast and cost-effective server to host the web application
  - Leverage MSU's existing server infrastructure
- Integrating CI/CD pipeline tooling
  - Integrate third party security applications into a comprehensive pipeline
  - Iteratively test and build sample pipeline applications

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# Status Report Presentation

## Meijer

## The Capstone Experience

### Team Meijer

Aidan Baird
Jordan Jones
Christopher Kocher
Hamil Viray
Alex Beck

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# Team Meijer

## Status Report

[1 of 4]

## Meijer

- Sponsor Overview
  - Meijer is an American Supermarket chain that operates primarily throughout the Midwestern United States
  - There are about 259 Meijer stores, with over half in the state of Michigan
- Project Overview
  - This project builds off of the previous semester's Meijer project team
  - The previous project was a Web App that operated as the start to an online storefront for Meijer branded products
  - This semester, we are adding to that Web App, both more product availability, as well as functionality for ordering the aforementioned products for store pickup
  - This also entails the design of a store side app that employees would use to receive orders and help fulfill said orders

# Team Meijer

## Status Report

[2 of 4]

### Meijer

- Server Systems / Software
  - Server access has not been disclosed but not yet given to us from the Meijer project team
  - Will use the preexisting databases along with an Azure server for handling orders
- Development Systems / Software
  - The previous capstone work has been given to started, and we have setup the web app on our local machines
  - iPads will be used for the store-side software and are currently being obtained and then will be sent to us by the Meijer team
- Project Plan Document
  - The Project Plan has started and an outline has been made
  - 50% Complete

# Team Meijer

## Status Report

[3 of 4]

### Meijer

- Client Contact
  - The client has been contacted, and a weekly meeting has been set up for Fridays at 11
  - We will meet with them in person at the end of the semester to record the project video, a date and time has not been set
- Team Meetings
  - Team meetings have been scheduled for Sunday night, along with possible meetings after All-hands meetings
  - We have already met about 5 times
- Team Organization
  - Front End Development: Jordan, Hamil
  - Database/Backend Development: Alex, Chris
  - Mobile Development: Aidan, Chris

# Team Meijer

## Status Report

[4 of 4]

## Meijer

Risks

- Azure access and allocation
  - How Azure is used with integration with website and mobile app
  - Implement existing solution with new database with Cross-platform support
- Team Member Mobile App
  - Creating and connecting mobile app with existing Meijer services
  - Access existing Meijer Azure servers and get input from Meijer for practical workflow for the app.
- Visual Studio Backend Management
  - Backend deployment with a reliable Windows machine as well as with Azure
  - Merge existing backend implementation with new database requirements
- SQL Database
  - Previous SQL Database does not exist
  - Create new database and refactor all code connection points

MICHIGAN STATE UNIVERSITY

# Status Report Presentation

## Robotic Job Coaching

## The Capstone Experience


Team Michigan State University CSE

Cole Lanzinger
Gera Berhanu
Hail Lim
John Nowinski
Nicolas Clark
Sean Finkel

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# Team Michigan State University CSE

## Status Report

[1 of 4]

## Robotic Job Coaching

- Sponsor Overview
  - Department of Computer Science at Michigan State
  - Dr. Charles Owen and Dr. Ranjan Mukherjee
  - Peckham, Inc.
- Project Overview
  - Job coaching utilizing a remote machine
  - Aides disabled workers
  - Job coach can interact remotely with a worker
  - One job coach can interact with multiple workers

# Team Michigan State University CSE

## Status Report

[2 of 4]

## Robotic Job Coaching

- Server Systems / Software
  - IOS app utilizes Docker and runs correctly
  - Android app has not introduced Docker
- Development Systems / Software
  - IOS app runs smoothly
  - Began Android app development
  - Have not integrated with the arm
- Project Plan Document
  - Began work on the project plan
  - Created a crude framework
  - 30% Complete

# Team Michigan State University CSE

## Status Report

[3 of 4]

## Robotic Job Coaching

- Client Contact
  - Met with both contacts. Weekly in-person meetings every Friday.
  - Have yet to be introduced to Peckham
- Team Meetings
  - Team has met 5 times
  - Scheduled weekly Friday meetings
- Team Organization
  - Hail, Cole, and Nick are working the front end of android development
  - Sean, Jack, and Gera are developing the back end

# Team Michigan State University CSE

## Status Report

[4 of 4]

## Robotic Job Coaching

Risks

- Risk 1
  - Integration between the code and the robot
  - Extensive testing at all steps of the process to ensure each function works correctly
- Risk 2
  - Connection between Android app and Docker server
  - Monitor and maintain logs to ensure transfer of data
- Risk 3
  - Pointing to locations in the user space
  - Enabling the robot with a method to point such as a Bluetooth laser pointer
- Risk 4
  - Fragility of the robot
  - Set speed limits and geofencing in order to restrain the arm from potentially harming itself and the workers

MICHIGAN STATE UNIVERSITY

# Status Report Presentation

## Test Platforms for Self-Driving Race Cars

### The Capstone Experience


Team MSU CSE SDRC

Ricardo Flores
Yuxuan Li
Andrew Nguyen
Vu Phi
Toby Wright
Jacob Youngerman

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Michigan State University


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# Team MSU CSE SDRC

## Status Report

[1 of 4]

## Test Platforms for Self-Driving Race Cars

- Sponsor Overview
  - PoliMOVE-MSU team for the Indy Autonomous Challenge
  - Full-scale race of self-driving vehicles
  - Professor Siegel and Professor Dahal
- Project Overview
  - The MSU team has infrequent access to the full-scale car
  - They need a smaller, real-world test car to test their AI
  - Our task is to create software to connect to, and record data from the scale-model car to improve the full-scale AI
  - Stretch goals include capturing real-time input to replay

# Team MSU CSE SDRC

## Status Report

[2 of 4]

## Test Platforms for Self-Driving Race Cars

- Server Systems / Software
  - No Server Systems
- Development Systems / Software
  - We are installing software onto a provided computer
  - We have investigated tutorials for the ROS software
  - We have decided on HTML for the frontend, and python for the backend due to its useful libraries on sensor data
  - We will have to wait for access to the real car we will be using
- Project Plan Document
  - We have some specifications outlined
  - We have one initial mock front-end
  - 10% Complete

# Team MSU CSE SDRC

## Status Report

[3 of 4]

## Test Platforms for Self-Driving Race Cars

- Client Contact
  - We have discussed with and received materials from our sponsor
  - We have meetings with our sponsor scheduled each Wednesday
- Team Meetings
  - We have had 8 full-team meetings
  - We meet at least weekly after class
- Team Organization
  - Toby on Interface Design
  - Ricardo and Vu on Sensor Integration
  - Li, Jacob, and Andrew on controlling the car

# Team MSU CSE SDRC

## Status Report

[4 of 4]

## Test Platforms for Self-Driving Race Cars

Risks

- Risk 1
  - Finding a suitable place to test the car
  - Scouting out locations
- Risk 2
  - Transfer of data from the car into the base station
  - Prototype programs to transfer mock data
- Risk 3
  - Connecting the sensors to ROS
  - Research the ROS tutorials
- Risk 4
  - Controlling the car with the provided wheel/pedals
  - Research software communication for the provided hardware

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# Status Report Presentation

## Crowd Sourcing Intuitions of Vowel Classifications

## The Capstone Experience


Team MSU Linguistics

Elizabeth Hier
Isaiah Fatka
Angelina Daoud
Collin Heavner
Blenda Yan
Luke Norvid

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# Team MSU Linguistics

## Status Report

[1 of 4]

## Crowd-Sourcing Intuitions of Vowel Classifications

- Sponsor Overview
  - Project sponsored by linguistics researchers studying dialect variations
  - Led by Dr. Sneller, Dr. Stanley and Dr. Nesbitt
  - Part of research to update North American dialect atlas
- Project Overview
  - Web application to collect and analyze dialect variations
  - Solves the need for updated dialect data collection and analysis across North America
  - Primary users are trained linguists that will classify words into lexical sets
  - Helps researches track how language has changed over time

# Team MSU Linguistics

## Status Report

[2 of 4]

## Crowd-Sourcing Intuitions of Vowel Classification

- Server Systems / Software
  - Rack Mounted Server – Running but not fully configured
  - MySQL – Local database created, database connected to server still needed
- Development Systems / Software
  - Docker – Configuration files set up, local running working
  - VS Code – All members have repo clones and have pushed hello world files
  - Node.Js- Not in use yet
- Project Plan Document
  - All sections of document have been assigned to team members
  - Only sections left are mock-ups, diagrams and technical specifications
  - 33% Complete

# Team MSU Linguistics

## Status Report

[3 of 4]

## Crowd-Sourcing Intuitions of Vowel Classification

- Client Contact
  - Meeting with our client every Friday at 2 PM and will continue to do so weekly
  - Meetings are on Teams with our group present – collaboration and communication
- Team Meetings
  - Group meetings have been held every Monday and Thursday in person
  - Hold meetings on Teams – extra support and collaborate on any additional work as needed
- Team Organization
  - Everyone contributing to areas that need additional help- assigned three members to work on backend and three on front end
  - Encouraging rotations – new experiences and equal participation

# Team MSU Linguistics

## Status Report

[4 of 4]

## Crowd-Sourcing Intuitions of Vowel Classifications

Risks

- Risk 1
  - Highlighting the correct vowel when there are multiple in a word like Santa
  - Mitigation: Look at a resource provided by our sponsor that classifies the stress on each vowel and write a prototype to use that
- Risk 2
  - Linking the database to our rack server
  - Mitigation: Get a hello world query running with a database set up in the server
- Risk 3
  - Dynamic leaderboard updating from a database
  - Mitigation: Locally hosted prototype leaderboard
- Risk 4
  - Allowing sponsors to upload new word sets to the database without learning all of the underlying code
  - Mitigation: Create a standalone prototype where we can drag and drop csv, json, and xml files and automatically update the database

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# Status Report Presentation
# Logged-In Branch Experience

## The Capstone Experience


Team MSUFCU

Alec Gardiner
Ryan Fitzgerald
Reyna McConville
Daniel Altamirano
Ruohong Kuang
Spencer Russell

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# Team MSUFCU

## Status Report

[1 of 4]

## Logged-In Branch Experience

- Sponsor Overview
  - MSU Federal Credit Union
  - Banking
  - Provide financial security
- Project Overview
  - Improve in person banking experience
  - Recognize faces when customer walks in
  - Display customer data to employee

# Team MSUFCU

## Status Report

[2 of 4]

### Logged-In Branch Experience

- Server Systems / Software
  - MySQL database
  - Web App server
  - Description &/or Status Point 3
- Development Systems / Software
  - HTML/CSS
  - MySQL
  - Building facial recognition process using Python
- Project Plan Document
  - Skeleton for project plan completed
  - Assigned slides for presenting and writing
  - 10% done!

# Team MSUFCU

## Status Report

[3 of 4]

### Logged-In Branch Experience

- Client Contact
  - Weekly meetings on Fridays established
  - Clarified project proposal details
- Team Meetings
  - Once or twice weekly after class
  - Total of four meetings so far
- Team Organization
  - Team roles established
  - Assigned starting tasks

# Team MSUFCU

## Status Report

[4 of 4]

## Logged-In Branch Experience

Risks

- Connection
  - How do we connect camera to software?
  - Research and testing
- Encryption
  - How do we ensure data will be secure?
  - Hash function to encrypt data
- Data storage
  - How do we store images of faces?
  - Find library for image storage
- Identifying wrong person
  - How can we avoid identifying the wrong person?
  - High quality camera footage

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# Status Report Presentation

## Airport Capacity & Ground Management

### The Capstone Experience


Team NetJets

Ben Grycza
Kendall Korcek
Ryan MacDonald
Jay Scott
Ryann Seymour
Emily Telgenhoff

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Michigan State University


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# Team NetJets

## Status Report

[1 of 4]

## Airport Capacity & Ground Space Management

- Sponsor Overview
  - World's leading private jet company
  - Sells fractional shares of private jets
  - Leads a fleet of over 600 planes
- Project Overview
  - Improve fleet management capabilities
  - Give real-time and projected capacity at airports
  - Create recommendations for improved operations
  - Employee facing web application

# Team NetJets

## Status Report [2 of 4]

## Airport Capacity & Ground Space Management

- Server Systems / Software
  - In process of obtaining AWS credentials from NetJets
  - Node.js server needs to be configured
  - AWS EC2 instances need to be setup to host application
- Development Systems / Software
  - React for UI with an initial “Hello World” demonstrated
  - GitLab repository setup with team member access
  - Access granted to plane and airport databases
- Project Plan Document
  - Drafted an initial outline with key milestones and deliverables
  - Completed screen mockups for the homepage, notifications, and airport simulation screens
  - 15% Complete

# Team NetJets

## Status Report

[3 of 4]

## Airport Capacity & Ground Space Management

- Client Contact
  - Regular virtual meetings scheduled for Tuesdays 9:00 a.m.
  - In-person meeting requested, but possibility is TBD
- Team Meetings
  - 6 meetings have occurred
  - Team meetings are Tuesdays after CSE498 lecture
- Team Organization
  - The team has been decomposed into 3 parts
  - Frontend {Ryann, Kendall}, Backend {Ben, Jay}, Database {Ryan, Emily}

# Team NetJets

## Status Report

[4 of 4]

## Airport Capacity & Ground Space Management

Risks

- Constant Data Updates
  - Currently, the client's data is from excel sheets that do not update
  - Discussing with our client the best path forward for creating a workflow that would allow us to update the data periodically, if that is not successful we may try utilizing an open-source API to constantly retrieve data
- Risk 2
  - We have not found a database that accurately depicts all airport parking coordinates for US-based airports
  - We have discussed with our client, their expectation lies with a certain 10-12 airports for which they have parking coordinates for
- Risk 3
  - Difficulty in creating dynamic, real-time map views with accurate and meaningful visual alerts.
  - Considering different visual representations such as graphical representations (bar charts/gauges)
- Risk 4
  - Designing an effective algorithm to generate recommendations based on variables like aircraft type and parking zones
  - Working with NetJets to determine most important influences to reduce over-reliance on less important factors.

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# Status Report Presentation

# Automated Damage Logging for Truck Drivers

## The Capstone Experience


Team RPM

Flower Akaliza

Gavin Bourdon

Hayden Rance

Alfredo Sanchez Perez

Dheeraj Thota

Troy Williams

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Michigan State University


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# Team RPM

## Status Report

[1 of 4]

## Automated Damage Logging for Truck Drivers

- Sponsor Overview
  - Non-asset based logistics and supply chain company
  - Provides specialized freight and vehicle transportation across North America, Europe, Mexico, and Canada
- Project Overview
  - Creating a mobile app to help truck drivers log damages on cars they are transporting in real time
  - Standardize efficient damage reports and increase accuracy of logs
  - Reduce paperwork by eliminating the need for manual documentation

# Team RPM

## Status Report

[2 of 4]

### Automated Damage Logging for Truck Drivers

- Server Systems / Software
  - Azure: waiting on access from client
- Development Systems / Software
  - Flutter: installed and working
  - FastAPI: not yet installed
  - PostgreSQL: not yet installed
- Project Plan Document
  - Working on mockups
  - Working on system architecture
  - 10 % Complete

# Team RPM

## Status Report

[3 of 4]

## Automated Damage Logging for Truck Drivers

- Client Contact
  - Synica Melton, VP of Product Engineering
  - We've met with him once and will meet weekly on Tuesdays and Fridays
- Team Meetings
  - Weekly meeting on Friday at 11 am
- Team Organization
  - Main client contact: Flower Akaliza
  - Front-end: Alfredo Sanchez Perez, Gavin Bourdon; ML: Dheeraj Thota, Hayden Rance; Back-end: Flower Akaliza, Troy Williams

# Team RPM

## Status Report

[4 of 4]

## Automated Damage Logging for Truck Drivers

Risks

- Risk 1
  - Getting an accurate model
  - Train, test, and optimize different models to find the ideal one
- Risk 2
  - Running the model on device while making faster
  - Write SWIFT code and connect it to Flutter
- Risk 3
  - Mapping all the AIAG codes might be difficult
  - Optimize the data set to match the AIAG codes
  - Use the output of the model to map it to the AIAG codes
- Risk 4
  - Making the automation real time (15-30 fps) will be challenging
  - Mitigation: fall back would be to make automation not real time

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# Status Report Presentation

## Surgical Needle Tracking

### The Capstone Experience


Team Stryker IST

Eric Redmon
Tyler Mirabitur
Eli Asmar
Joseph Renas
Brendan Niles
Ricky Huang

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# Team Stryker IST

## Status Report

[1 of 4]

## Surgical Needle Tracking

- Sponsor Overview
  - Global leader in medical technologies
  - Mission: Improve patient and healthcare outcomes
  - Offers innovative products and services used in operating rooms around the world
- Project Overview
  - Needles being left inside patients
  - Develop a needle detection and tracking solution
  - Creating SurgiCount Gen 3
  - Medical professionals can utilize this software

# Team Stryker IST

## Status Report

[2 of 4]

## Surgical Needle Tracking

- Server Systems / Software
  - SQLite3
  - RESTful APIs
- Development Systems / Software
  - Machine Learning Frameworks
  - Object Detection
  - Mobile App Development
- Project Plan Document
  - Strong understanding of the problem
  - Solution aligns with clients
  - 20% Complete

# Team Stryker IST

## Status Report

[3 of 4]

### Surgical Needle Tracking

- Client Contact
  - Made contact and set up connections
  - Weekly Friday meetings
- Team Meetings
  - Weekly Monday and Friday meetings
  - Daily check ins
- Team Organization
  - 3 for front end
  - 3 for back end

# Team Stryker IST

## Status Report

[4 of 4]

## Surgical Needle Tracking

Risks

- Risk 1
  - Lack of training data
  - Work with clients to develop our own training data
- Risk 2
  - Lack of app development experience
  - Online resources and practicing
- Risk 3
  - Working with camera and iPad
  - Trial and error testing with physical devices
- Risk 4
  - Interference in the operating room
  - Experimenting with camera positioning, lighting, and camera types

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# Status Report Presentation

## Watcher of Attuned Video Experiences (WAVE)

## The Capstone Experience


Team TechSmith

Marcus Cohen, cohenm16@msu.edu
Josh Costantino, costan32@msu.edu
Shane Jose, joseshan@msu.edu
Meenakshi Menon, menonmee@msu.edu
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# Team TechSmith

## Status Report

[1 of 4]

## Watcher of Attuned Video Experiences (WAVE)

- Sponsor Overview
  - Global leader in screen recording & screen capturing technologies
  - Bill Hamilton, MSU Computer Science graduate, founded TechSmith in 1987
  - Flagship Products: Snagit, Camtasia
- Project Overview
  - Personalized Video Playback Optimization
  - Enhanced Interactive Experience
  - Continuous Improvement Through Feedback
  - Wide Applicability Across Audiences

# Team TechSmith

## Status Report

[2 of 4]

## Watcher of Attuned Video Experiences (WAVE)

- Server Systems / Software
  - Microsoft Azure
  - Azure SQL Database
  - OpenAI
- Development Systems / Software
  - React/Typescript
  - FFmpeg
  - Flask/Python
- Project Plan Document
  - Discovered Risks and Mitigations
  - Finalized Required Technologies
  - 20% Complete

# Team TechSmith

## Status Report

[3 of 4]

## Watcher of Attuned Video Experiences (WAVE)

- Client Contact
  - Discussed Project Overview with Client
  - Weekly meetings: 10 AM Wednesdays
- Team Meetings
  - Scheduled for every Monday
- Team Organization
  - Frontend - Marcus, Meenakshi, Shane
  - Backend - Phoebe, Noor, Josh
  - Everyone will work on both sides over time

# Team TechSmith

## Status Report

[4 of 4]

## Watcher of Attuned Video Experiences (WAVE)

Risks

- How to dynamically update videos based on user preferences
  - Need to be able to add, remove, re-edit segments of videos
  - Azure AI Video Indexer can help extract key points and timestamps
- How to enhance user interactive experience
  - User gives live feedback as the video progresses
  - Update/Store user preferences in a database
  - Use OpenAI to provide additional context
- How to seamlessly integrate video player
  - What video format(s) will support the backend and frontend
  - Need to combine multiple development tools (Flask, FFmpeg, Azure AI, React)

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# Status Report Presentation

## Training Simulator Using GPS-Indexed Video

## The Capstone Experience


### Team Union Pacific

Mohamed Ahmed
Tre Benson
Melinda Fadool
Ravi Gangaiahanadoddi
Nico Roberts
Abigail Werden

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# Team Union Pacific

## Status Report

[1 of 4]

## Training Simulator Using GPS-Indexed Video

- Sponsor Overview
  - Major railroad in North America
  - Ships variety of goods
  - Connects 23 U.S. States
- Project Overview
  - Train conductor’s using simulation
  - Integrate real world videos into existing simulation
  - Display messages and errors
  - Add in 3D overlays of weather and signs

# Team Union Pacific

## Status Report

[2 of 4]

### Training Simulator Using GPS-Indexed Video

- Development Systems / Software
  - Unity is created
  - Access to Union Pacific API
- Project Plan Document
  - First rough draft is mostly completed
  - Still working on Design Specifications
  - 80% Complete

# Team Union Pacific

## Status Report

[3 of 4]

## Training Simulator Using GPS-Indexed Video

- Client Contact
  - Met with client virtually multiple times to go over project expectations and software
  - Set up recurring meetings for Thursdays at 11:30am
- Team Meetings
  - Team meets virtually every other day
  - Meetings are typically Wednesday at 7pm
- Team Organization
  - Videos – Abby and Tre
  - API – Ravi and Nico
  - Test Harness – Mohamed and Melinda

# Team Union

## Status Report

[4 of 4]

## Training Simulator Using GPS-Indexed Video

Risks

- How to implement the test harness
  - What methods or technology can we use to achieve this
  - Add hard coded test cases
- Inconsistent GPS data between the simulation and the video file
  - Handling and preventing erroneous video playback
  - Implement a threshold range to handle inconsistent metadata
- Getting the video playback to align with train speed
  - Syncing the GPS coordinates to the video and change the speed
  - Convert the GPS coordinates using provided table and figuring out the acceleration rate
- Smooth transition between videos
  - Linking the videos together when switching tracks or going back a set amount of miles
  - Start by hardcoding video playback to sync up

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# Status Report Presentation

## Automotive Service Advisor AI Assistant

### The Capstone Experience


Team Urban Science

John Harris
Owen Miller
Omar Osman
Srujan Patil
Joshua VanBynen
Travis Wright

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# Team Urban Science

## Status Report

[1 of 4]

## Automotive Service Advisor AI Assistant

- Sponsor Overview
  - Urban Science is a global consulting firm
  - Headquartered in Detroit, MI
  - Specialize in data analytics and technology
  - Automotive and retail industry solutions
- Project Overview
  - Create a mobile application to help automotive service advisors
  - Using vehicle service data to recommend services
  - Personalized sales approach using customer demographics

# Team Urban Science

## Status Report

[2 of 4]

## Automotive Service Advisor AI Assistant

- Server Systems / Software
  - Configured .NET Web API
  - Created and tested a basic Azure script to analyze vehicle VIN
  - Initial research and SQL server design
- Development Systems / Software
  - Initialized MAUI Projects in VS Code
  - Tested iOS and Android device simulators with hot reloading
  - Created an Apple Developer account and running on physical device
- Project Plan Document
  - Progress is *pending*
  - Sections are assigned and to be completed by 2/2 @ 11:59 PM
  - 15% Complete

# Team Urban Science

## Status Report

[3 of 4]

## Automotive Service Advisor AI Assistant

- Client Contact
  - Met with Client once: January 22nd from 1:30 PM – 2:00 PM
  - Recurring meetings every Wednesday from 2:00 PM – 2:30 PM
- Team Meetings
  - Scheduled meetings both before and after with Client and TM
  - Met seven times total; flexible scheduling to accomplish tasks
- Team Organization
  - Customer Liason: Josh VanBynen
  - Front-End Lead: Owen Miller
  - Back-End Lead: Omar Osman
  - Full-Stack Lead: Srujan Patil
  - Database Management:  Travis Wright
  - Data Analytics: John Harris

# Team Urban Science

## Status Report

[4 of 4]

## Automotive Service Advisor AI Assistant

Risks

- Capturing Customer Demographic Data
  - Description: We need to store customer data in order to recommend services
  - Mitigation: Create a system where we can ask the customer to fill in a questionnaire
- Scanning Mileage on Vehicles
  - Description: When using character recognition, it is difficult for software to filter which numbers correspond with vehicle mileage or RPM, etc.
  - Mitigation: Add a manual input for mileage; look into ML models that can be trained specifically to look for vehicle mileage
- Transmitting VIN Image from Mobile App
  - Description: We need to be able to transmit a readable image from our .NET MAUI Native application to our .NET Web API
  - Mitigation: Research .NET MAUI libraries that allow for capturing the users camera
- Web API Hosting
  - Description: We need a backend API that is reliable for our app to function
  - Mitigation: Host our backend locally and shift to using Docker when hosting on a VM or cloud provider

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# Status Report Presentation

## Centralized Comment History Microservice

## The Capstone Experience


Team UWM

Brad Deaner
Aaryan Walia
Macaulay Dailey
Melvin Thomas III
William Arnold
Alex Banker

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# Team UWM

## Status Report

[1 of 4]

## Centralized Comment History Microservice

- Sponsor Overview
  - American Wholesale Mortgage Lender
  - Headquartered in Pontiac, Mi
  - Largest Mortgage Lender in the US
- Project Overview
  - Centralized independant microservice to decouple comment histories
  - Reduces need to reinstate archived full loan records
  - Removes the need to store comments

# Team UWM

## Status Report

[2 of 4]

## Centralized Comment History Microservice

- Server Systems / Software
  - No new server provisioning will be required as all infrastructure is fully functional.
  - SQL and C# are the intended languages for development and we have began learning and/or refreshing on the knowledge of them
- Development Systems / Software
  - Research has been done on multiple software analysis tools
- Project Plan Document
  - Project plan has been started
  - We have a complete first draft
  - 20% Complete

# Team UWM

## Status Report

[3 of 4]

## Centralized Comment History Microservice

- Client Contact
  - Have had an initial meeting and established a recurring weekly meeting, every Thursday at 5pm
  - Planning the in-person meeting
- Team Meetings
  - Established 2 weekly team meetings, Tuesdays and Thursdays after class
  - We have had 4 team meetings
- Team Organization
  - Alex - UI design
  - Melvin - Executive Summary
  - Brad - Risk Analysis
  - Will - Technical specifications
  - Mac - Technical specifications
  - Aaryan – Functional Specifications

# Team UWM

## Status Report

[4 of 4]

## Centralized Comment History Microservice

Risks

- Risk 1
  - Decoupling data from the database while retaining data integrity
  - Testing on a separate server with dummy data, collaborating with the existing database team
- Risk 2
  - Ensuring data stored remains efficient and accessible
  - Reference existing algorithms in UWM's code database while keeping it adaptable to our needs
- Risk 3
  - Keeping the private data of UWM secure by preventing data leaks and other security flaws
  - Utilizing provided security analysis software and avoiding common security mistakes

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# Status Report Presentation

## Safe-Journey AI 2.0

## The Capstone Experience


### Team Volkswagen

Ethan Rush
Grant Bossio
Seth Neubauer
CJ Nwogu
Emberlynn Zhao
Aashish Harishchandre

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# Team Volkswagen

## Status Report

[1 of 4]

## Safe-Journey AI 2.0

- Sponsor Overview
  - Auto-Manufacturer
  - Auburn Hills, MI
  - Mobile Experience Team
- Project Overview
  - Enhance Driver Safety
  - Plans Routes to Avoid Dangerous Areas
  - Tracks Users to Final Destination
  - Protecting Users Concerned About Dangerous Weather & Events

# Team Volkswagen

## Status Report

[2 of 4]

## Safe-Journey AI 2.0

- Server Systems / Software
  - Windows VM Up & Running
  - Google Cloud APIs Configured
  - Connected ML Model to Base Application
- Development Systems / Software
  - Android Studio Set Up
  - GitLab Repository Initialized
  - Migrated & Tested Existing Code-Base
- Project Plan Document
  - Screen Mockups Designed – Being Revised
  - Started Designing System Architecture Diagrams
  - 5% Complete

# Team Volkswagen

## Status Report

[3 of 4]

## Safe-Journey AI 2.0

- Client Contact
  - Client Implementation & UI Discussions
  - Weekly Meetings Scheduled – (Mon.)
- Team Meetings
  - Team Meetings Scheduled – (Twice a Week)
  - Team Roles Selected – (Subject to Change)
- Team Organization
  - Project Planning & Design
  - Initializing Base Software

# Team Volkswagen

## Status Report

[4 of 4]

## Safe-Journey AI 2.0

Risks

- Risk 1
  - How to Obtain Real-Time Crime Data
  - Conversations with Client & ML Research (NLP)
- Risk 2
  - Avoidance Waypoints
  - Look into & Test Route-Chaining
- Risk 3
  - How to Re-Route Based on New Hazards
  - Establish an Area of Effect for Events on Route & Chain Routes to Avoid
- Risk 4
  - Apple CarPlay Integration
  - Research Software Implementation & Test w/ Emulator(s)

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# Status Report Presentation

## AI-Powered Precision Cooking with TasteLogic

## The Capstone Experience


### Team Whirlpool

Darayus Daboo
David Wasilewski
Frank Puglise
Lauren Funk
Pavel Shevchenko
Aaron Ngo

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# Team Whirlpool

## Status Report

[1 of 4]

## AI-Powered Precision Cooking with TasteLogic

- Sponsor Overview
  - Leading kitchen and laundry appliance company
  - Stationed in Benton Harbor, MI
  - Focused on improving and innovating for homes
- Project Overview
  - An AI cooking tool located on smart appliance/oven that determines the best way to cook different food types
  - Simplifies cooking by tuning cooking cylces based on user preferences inputted on appliance interface
  - Home cooks will be able to use this tool during their regular cooking routines

# Team Whirlpool

## Status Report

[2 of 4]

## AI-Powered Precision Cooking with TasteLogic

- Server Systems / Software
  - Whirlpool Oven w/ Integrated Camera
  - OpenAI and Google Gemini LLMs
  - React for project front-end
- Development Systems / Software
  - Gitlab is set up
  - React project created and pushed
  - Firebase being implemented
- Project Plan Document
  - Filled overview and risks
  - More info for screen mock ups
  - 20% Complete

# Team Whirlpool

## Status Report

[3 of 4]

## AI-Powered Precision Cooking with TasteLogic

- Client Contact
  - Basis Established, Incoming Data and hardware
  - 1 Weekly Client Conference Call
- Team Meetings
  - 2 Weekly Meetings - 1 zoom, 1 in-person
  - 1 Stand-up meeting, 1 Working meeting
- Team Organization
  - AI/LLM – Darayus D & Pavel S
  - Frontend – Lauren F & David W
  - Backend – Frank P & Aaron N
  - Client Contact – Pavel S
  - Project Manager – David W
  - Secretary – Lauren F

# Team Whirlpool

## Status Report

[4 of 4]

## AI-Powered Precision Cooking with TasteLogic

Risks

- Wi-Fi Connection to Oven
  - Description – The whirlpool oven requires Wi-Fi for the embedded Android App
  - Mitigation – Plan for multiple avenues, experiment with LAN, USB-C,
- Accuracy/Integration of LLM agent
  - Description – Determining the success of LLM responses compared to desired result
  - Mitigation – Testing out multiple LLM platforms
- Testing/R&D
  - Description – The oven requires Mutiple food types to be tested on a 5-set scale
  - Mitigation – Use client contact for more information (FoodTech Team)

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# Status Report Presentation

## Intelligent Ticketing and Release Management

## The Capstone Experience


Team WK Kellogg Co

Alex Gale
Gavin Heiner
Shuja Husain
Jennifer Lee
Ryan Lind
Sawyer VanDyke

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# Team WK Kellogg Co

## Status Report

[1 of 4]

## Intelligent Ticketing and Release Management

- Sponsor Overview
  - A leading cereal manufacturer founded in 1906
  - Focuses on manufacturing and distributing branded ready-to-eat cereals in the U.S, Canada, and Caribbean
  - Kellogg Co separated in 2023 into Kellanova (owns 82%) and WK Kellogg Co (owns 18%)
- Project Overview
  - Addresses the need for efficient IT management tools after separation from Kellanova (300 to 40 IT employees)
  - Improves incident management through AI-powered routing and prioritization
  - IT support teams, enterprise architecture team, and application sustainment owners will be the primary users
  - All self-service IT inquires go to lowest priority

# Team WK Kellogg Co

## Status Report

[2 of 4]

## Intelligent Ticketing and Release Management

- Server Systems / Software
  - AWS ControlTower
  - Office 365
  - AWS Connect
- Development Systems / Software
  - AWS S3
  - AWS Chatbot
  - AWS Q
- Project Plan Document
  - Started writing the summary and specifications
  - Drafted AWS architecture design
  - 20% Complete

# Team WK Kellogg Co

## Status Report

[3 of 4]

## Intelligent Ticketing and Release Management

- Client Contact
  - Met with our client on 1/22
  - Will meet with our client weekly on Fridays 9am to discuss progress and alignment with specific needs
- Team Meetings
  - Met 3 times as a team so far
  - Will have weekly team meetings after class Thursdays
- Team Organization
  - IT Ticket Management team
  - Release Management team

# Team WK Kellogg Co

## Status Report

[4 of 4]

## Intelligent Ticketing and Release Management

Risks

- Risk 1
  - No prior experience working with AWS
  - Learn AWS services- courses & videos
- Risk 2
  - AI models could misinterpret ticket language
  - Train AI models with historical ticket data provided from WK
- Risk 3
  - Sensitive ticketing data could be exposed
  - Work with AWS specialist for best practices regarding security and data
- Risk 4
  - Crawling could fail due to restrictive access
  - Use web scraping tools and establish known vendors