MICHIGAN STATE UNIVERSITY

09/10: Team Status Reports

The Capstone Experience

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From Students…
…to Professionals

Team Amazon

Status Report

[1 of 4]

AVAST: Amazon Video And Shopping Technology

- Project Overview
  - Allow users to stream videos from external sources (Amazon Prime, Netflix, YouTube, Hulu, etc.)
  - Identify key items and people in video streams
  - Find products related to items and people presented in the video
  - Display product information to allow users to quickly find and purchase products
- Project Plan Document
  - Started a skeleton document
  - Design specification complete
  - System architecture diagram complete
  - Risks and schedule complete
  - 20% written, goal of 100% written by tomorrow, 9/13/18

Team Amazon

Status Report

[2 of 4]

AVAST: Amazon Video And Shopping Technology

- Server Systems / Software
  - AWS EC2 for backend hosting – server is setup and running
  - AWS S3 and CloudFront for frontend hosting – waiting for AWS account
  - AWS services for data processing – waiting for AWS account
- Development Systems / Software
  - Ionic (JavaScript) frontend – initial “hello world” app running
  - Laravel (PHP) backend – initial “hello world” app running
  - Prime Video/YouTube/Hulu/Netflix API – not yet started
  - Amazon Shopping API – not yet started

Team Amazon

Status Report

[3 of 4]

AVAST: Amazon Video And Shopping Technology

- Client Contact
  - In-person meeting on Sep 7th, Detroit
  - Scheduled weekly online meetings every Friday at 2:30pm
- Team Meetings
  - Held 3 team meetings
  - Scheduled weekly meetings every Thursday at 11:15am
- Team Organization
  - Planning to split up frontend and backend development

Team Amazon

Status Report

[4 of 4]

AVAST: Amazon Video And Shopping Technology

Risks

- Risk 1
  - Integration with different video sources
  - We know we can integrate with YouTube, more research is needed for other services (Netflix, Hulu, and Amazon Prime)
- Risk 2
  - Getting MSU AWS credentials in time to start development other than EC2
  - Contact client to obtain AWS credentials
- Risk 3
  - Availability of Amazon advisors to answer questions throughout the week
  - Scheduled weekly online meetings with Pete and Kyle for progress updates
- Risk 4
  - Keeping user credentials safe
  - We are hoping to integrate with Login with Amazon to handle secure logins and using HTTPS connection

Team Aptiv

Status Report

[1 of 4]

Autonomous Vehicle Fleet Connectivity Apps

- Project Overview
  - Calendar GUI for booking vehicles
  - Allows user to see various stats of vehicle while scheduling it
  - Provides notifications/alerts based on needs
  - Allows users to operate functions from an app interface
- Project Plan Document
  - Skeletoned – Title Page, Table of Contents, Header/Footer
  - Rough Draft of Executive Summary
  - Developed Functional Specifications
  - Established first Schedule

Team Aptiv

Status Report

[2 of 4]

Autonomous Vehicle Fleet Connectivity Apps

- Server Systems / Software
  - Laptops are being delivered to us
  - Azure services managed by Aptiv
  - AMDAS - Supervisory tool used to manage test fleet and gather metadata from driving
- Development Systems / Software
  - Testbed programs created with Visual Studio
  - Angular for schedule interface
  - C#/.NET for SQL Azure interactions

Team Aptiv

Status Report

[3 of 4]

Autonomous Vehicle Fleet Connectivity Apps

- Client Contact
  - 2 conference calls
  - 1 in-person meeting with a tour of the facility
- Team Meetings
  - 6 team meetings
  - Scheduled weekly team meetings on Mondays / Wednesdays
- Team Organization
  - Roles for client contact, front and back end leads
  - Following Agile methodology with the client

Team Aptiv

Status Report

[4 of 4]

Autonomous Vehicle Fleet Connectivity Apps

Risks

- Risk 1
  - Gaining access to our company laptops
  - Research available scheduling apps to ensure time is not wasted
- Risk 2
  - No direct access to the database systems
  - Work with Aptiv contacts to get the proper tables in place that we need
- Risk 3
  - No team member has mastered C#
  - Learning via online tutorials and developing small testbed projects
- Risk 4
  - 10 weeks (5 sprints) for development
  - In person meetings for the beginning of each sprint

Team Auto-Owners

Status Report

[1 of 4]

Jeffrey – Virtual Insurance Claim Advisor

- Project Overview
  - Smartphone application for submitting claims
  - Natural Language Processing (NLP) assistant
  - Data and File detection/collection/submission
  - Web Portal for viewing submitted claims
- Project Plan Document
  - Status: Incomplete
  - Outline of overall organization of document
  - Screen Mockups underway
  - Percentage complete: 10%

Team Auto-Owners

Status Report

[2 of 4]

Jeffrey – Virtual Insurance Claim Advisor

- Server Systems / Software
  - Apache Server - Decided on
  - Web Portal Mockup - Built, undeployed
  - Web Service API (Kotlin) - Researched
  - SQL Server Database - Data model in development
- Development Systems / Software
  - Android Studio (Android App) - Underway
  - IntelliJ & Node Package Manager (Web App) - Underway
  - Dialogflow (Google's NLP) - Underway

Team Auto-Owners

Status Report

[3 of 4]

Jeffrey – Virtual Insurance Claim Advisor

- Client Contact
  - Weekly conference call: Fridays @ 9 AM
  - In-person meeting: Friday, August 31st & September 7th
- Team Meetings
  - Weekly group collaboration meetings
  - Scheduled for Wednesday/Thursday/as needed
- Team Organization
  - Backend (Server/Web Service/Database) - Connor
  - Android App - Alex
  - Web App (Claim portal) - Mike
  - Natural Language Processing (Dialogflow) - Nabiha

Team Auto Owners Auto-Owners

Status Report

[4 of 4]

Jeffrey – Virtual Insurance Claim Advisor

Risks

- Authenticate User
  - Various roles to authenticate. Personal data stored securely.
  - Hashed/salted passwords. Validation against user permission to file claim.
- Secure File Transfer
  - Upload confidential videos, images, and documents to server
  - Hash records in database, encrypt files
- Cross-Platform Variation
  - Project is currently a POC - Android Required. Future implementation could involve an iOS app.
  - Keep UI simple. Dialogflow API can be leveraged in an iOS application if need be.

Team Dow

Status Report

[1 of 4]

Assist IT: Mobile IT Help Assistant

- Project Overview
  - IT Chatbot trained to assist Dow employees using crowdsourcing
  - A Responsive Web Application
  - Uses Natural Language Processing in real-time
  - Interfacing with knowledge base via ServiceNow APIs and Dow's Window Servers
- Project Plan Document
  - Skeleton document
  - Working on Executive Summary and Schedule
  - 10% complete

Team Dow

Status Report

[2 of 4]

Assist IT: Mobile IT Help Assistant

- Server Systems / Software
  - Windows 2012 R2 on Server
    - Will host SQL Database
    - Installed and up to date
  - Azure (hosting web app)
    - Created project and granted access to all members
    - Have live demo - Link
- Development Systems / Software
  - Visual Studio
    - ASP.NET with C#
    - ServiceNow APIs

Team Dow

Status Report

[3 of 4]

Assist IT: Mobile IT Help Assistant

- Client Contact
  - Two meetings
  - Weekly conference call on Tuesdays
  - Scheduling an on site visit
- Team Meetings
  - Have met 6 times
  - Group meetings are on Wednesday
  - Triage meetings are on Monday
- Team Organization
  - Charlie is point of contact
  - Use Slack for communication
  - Charlie and Keaton are backend developers and knowledge base
  - Cassie and Brandon are frontend developers

Team Dow

Status Report

[4 of 4]

Assist IT: Mobile IT Help Assistant

Risks

- Interfacing with ServiceNow's API
  - Learning the structure of the data
  - We are getting access to the service by the end of this week
- Machine Learning
  - Working with Azure based API for Natural Language Processing and query prediction
  - Watching tutorials, reading documentation, and working on "Hello world" apps
- Azure
  - PaaS that will be used for version control and hosting a web app
  - Team members without experience are learning through Microsoft tutorials
- Learning C# and/or JS
  - Most of the team does not know C#
  - Working on learning the basics through tutorials and "Hello world" apps

Team Ford

Status Report

[1 of 4]

Ford Customer App Review Dashboard

- Project Overview
  - Sentiment Analysis of customer app reviews
  - Web Dashboard to present Sentiment Data
  - Slack Bot to periodically report findings
  - Administration Portal for configuration
- Project Plan Document
  - Template completed
  - Drafts of System Diagrams, Mock-ups, & Functional specs
  - Design specs, tech specs delegated for this week
  - ~40% complete

Team Ford

Status Report

[2 of 4]

Ford Customer App Review Dashboard

- Server Systems / Software
  - Working with Ryan to get AWS Lambda access
  - Github and Travis CI set up with frontend Angular boilerplate
  - Github for prototypes set up
- Development Systems / Software
  - All Languages and IDES set up and installed
  - Hello World Applications in Angular, Spring, and Slack
  - Trello Boards set up for project management

Team Ford

Status Report

[3 of 4]

Ford Customer App Review Dashboard

- Client Contact
  - Two Conference calls held so far, Weekly Call Friday @ 1:00
  - Potential In-Person Meeting after all-hands meeting
- Team Meetings
  - 6 Full Team Meetings held so far
  - Weekly Meetings Wednesdays and Fridays
- Team Organization
  - Each team member in charge of a module
  - Communication via Slack, and GSuite

Team Ford

Status Report

[4 of 4]

Ford Customer App Review Dashboard

Risks

- Risk 1
  - Getting access to necessary deployment resources
  - Develop a backup plan in case Lambda access unavailable
- Risk 2
  - Pulling Data from App Stores
  - Developing a prototype for API's and Web Scraping
- Risk 3
  - Integrating Python Natural Language Toolkit with Java
  - Exploring possibility of using Lambda to separate modules
- Risk 4
  - User Authentication on web dashboard
  - Prototype with LDAP

Team Herman Miller

Status Report

[1 of 4]

Material Normalization Using Computer Vision

- Project Overview
  - End user submits an image of a fabric
  - Our model will categorize the fabric based on color, pattern, and pattern scale
  - Return fabrics that have matching categories
  - Stretch: If no internal fabrics match, suggest similar fabrics
- Project Plan Document
  - Executive Summary complete
  - Started writing Functional Specifications
  - Started writing Risk Analysis
  - Schedule being filled out

Team Herman Miller

Status Report

[2 of 4]

Material Normalization Using Computer Vision

- Server Systems / Software
  - AWS EC2 instance with mounted S3 buckets and python3.7 environment
  - Tensorflow, Keras and AWS SageMaker - 65% accuracy for color and 60% accuracy for patterns with prototypes
  - GraphQL API - several prototypes succeeded in downloading images and category tag information
- Development Systems / Software
  - Visual Studio Code with Python 3.7 and other libraries
  - GitHub and SSH – all team members have access
  - PyCharm

Team Herman Miller

Status Report

[3 of 4]

Material Normalization Using Computer Vision

- Client Contact
  - Met with Tom and Andrea in-person first week.
  - Set-up weekly Skype calls every Wednesday
- Team Meetings
  - Weekly meetings on Monday
  - Frequent meetings before and after all-hands meetings and during weekends adding up to more than 10 meetings so far
- Team Organization
  - Communicate through Slack and GroupMe
  - Team GitHub and AWS accounts

Team Herman Miller

Status Report

[4 of 4]

Material Normalization Using Computer Vision

Risks

- Lack of Technology experience
  - Many new technologies to learn, not a lot of time
  - Each one of us is learning one technology via creating prototypes and tutorials
- Unsure of how to Identify Pattern-Scale
  - Client requested a machine learning model to determine “pattern scale”
  - More detail from client will be needed
- Image tags are not consistent
  - Pictures have incorrect color or pattern data creating inconsistencies in training
  - Manually removing inconsistent tags currently, new method will have to be created

Team Meijer

Status Report

[1 of 4]

Meijer Shrink Reduction Using Blockchain

- Project Overview
  - Use blockchain technology to reduce shrink.
  - Track highly-perishable items to prevent waste.
  - Create a mobile and web application to access this data.
  - Use system analytics to determine which stores can best sell the excess product.
- Project Plan Document
  - The Project Plan Document has been started.
  - A document skeleton has been completed.
  - The Project Plan Document is about 5 percent complete.

Team Meijer

Status Report

[2 of 4]

Meijer Shrink Reduction Using Blockchain

- Server Systems / Software
  - Need to get a SQL server up and running.
  - Develop chaincode to implement blockchain network.

- Development Systems / Software
  - Downloaded and installed HyperLedger Fabric development tools and libraries.
    - Tested and wrote a basic program.
  - Need to download Android Studio and Xcode to develop Android and iOS applications.

Team Meijer

Status Report

[3 of 4]

Meijer Shrink Reduction Using Blockchain

- Client Contact
  - We have talked with our client and have a weekly conference call on Friday.
  - We are planning on adding another meeting with them on Tuesday.
  - We are working with Meijer to schedule a tour at the local distribution center in Lansing.
- Team Meetings
  - The team has met 5 times so far.
  - We do not have scheduled meetings.
    - We are all free after 6:30 pm. This is when we plan to complete most of our work.
- Team Organization
  - Mohammed and Lucas will be working on the development of the iOS, Android, and Web applications.
  - Matthew, Moritz, and Phillip will be working on the blockchain and backend implementation.

Team Meijer

Status Report

[4 of 4]

Meijer Shrink Reduction Using Blockchain

Risks

- Implement Blockchain Technology
  - The blockchain database must work as it is the foundation of the project.
  - Research the HyperLedger Fabric blockchain technology and complete prototypes.
- Construct iOS, Android, and Web Apps
  - These apps are a major part of the project and are the primary way of accessing the stored data.
  - Research the appropriate frameworks and libraries.
- Learn Go Programming Language
  - The smart contract and chain code of HyperLedger Fabric is written in Go. Effective use of this language will be key to success in this project.
  - Complete Go language tutorials and simple programs.
- Compatibility with Meijer Web Services
  - The system must be able to communicate with Meijer Web Services to access Meijer data.
  - Consult with Meijer about Meijer Web Services and ask them for access.

Team Michigan State University

Status Report

[1 of 4]

Navigating MSU's Campus Using Augmented Reality

- Project Overview
  - Location-based AR labels/descriptions for buildings
  - Location-based AR navigation on campus
  - Potentially support iOS and Android
- Project Plan Document
  - Document about 10% completed
  - Planning to show the document to clients on Sep. 21
  - Basic outline and formatting
    - Name of clients and team members
    - Table of Contents
    - Assigned tasks

Team Michigan State University

Status Report [2 of 4]

Navigating MSU's Campus Using Augmented Reality

- Server Systems / Software
  - MSU ArcGIS API
    - Communicating with API from iOS and parsing results (working)
- Development Systems / Software
  - Xcode: ARKit, CoreLocation
    - Downloaded Xcode and set up SDK
    - Can display labels somewhat accurately in 3D space
  - Android Studio: ARCore
    - Set dependencies and SDK to enable ARCore
    - Tested that ARCore works on Pixel1 and G6

Team Michigan State University

Status Report

[3 of 4]

Navigating MSU's Campus Using Augmented Reality

- Client Contact
  - In person meeting (had two in person meetings)
  - Every Friday 2:00 – 3:00pm
- Team Meetings
  - Have met 5 times
  - Every Monday 4:30 – 5:30pm
- Team Organization
  - Android Team: Minseo, Yongqi
  - iOS Team: Shaye, Paul
  - GIS: Austin

Team Michigan State University

Status Report [4 of 4]

Navigating MSU's Campus Using Augmented Reality

Risks

- Risk 1: AR is a very new technology - easy
  - Because AR is a new technology, the documentation isn't great. Many devices don't run it.
  - We found a few devices that works.
- Risk 2: There are not many resources for location-based AR apps - medium
  - Many resources are not perfect. Some locations are labeled weirdly and some code has bugs in it.
  - There is GIS available for information about locations on campus. We'll learn how to label locations from existing examples and develop it further based on GIS (assigned to Austin).
- Risk 3: Navigation does not work accurately inside buildings due to walls - hard
  - Existing AR navigation apps lead users to go through walls when the apps are running inside a building.
  - Develop the app assuming user is running outside first and then get more accurate information from GPS.
- Risk 4: Technological differences between iOS and Android - medium
  - There is no research on which platform works better with location-based AR.
  - We will develop different features on each platform for couple weeks, and then decide which platform (or both) we will continue developing in depth by Sep. 24. (Confirmed by clients)

Team Microsoft

Status Report

[1 of 4]

ITPro Company Portal

- Project Overview
  - Extend the functionality of the previous app by adding ITPro-exclusive features.
  - Get/Set Intune setting by ITPros using Microsoft Graph.
  - Design UI for both iOS and Android.
- Project Plan Document
  - General document templating: most notably, the cover page and table of contents.
  - We have drafted risks section, as well as the “scheduling” section.
  - About 10% done; ramping up now.

Team Microsoft

Status Report

[2 of 4]

ITPro Company Portal

- Cloud/Software Infrastructure
  - Microsoft Graph
    - The API that powers all of Office 365 and various other MS technologies.
  - Microsoft Azure/Intune Portal
    - We were able to create an ITPro (admin) account and IW (client) accounts using the portal.
- Development Systems / Software
  - Microsoft Visual Studio Enterprise 2017
    - Installed Xamarin and created initial project codebase/repository.

Team Microsoft

Status Report

[3 of 4]

ITPro Company Portal

- Client Contact
  - Weekly conference call on Tuesday and Thursday. 3 conference calls up to this point.
- Team Meetings
  - Manage through Slack and Microsoft Teams
  - We have had 4 formal team meetings so far, informal meetings before/after lecture.
  - We have scheduled Team Triage meetings with James for Fridays from 4:00pm-4:30pm.
- Team Organization
  - Client contact assigned (Jason)
  - 2-and-2 structure; design group is led by Ayaka and Zoe, while the software group is led by Jason and Zhanming.

Team Microsoft

Status Report

[4 of 4]

ITPro Company Portal

Risks

- Programming in C# (Moderate)
  - No experience in C# or using cross-platform development techniques.
  - *Mitigation:* Watch some tutorial videos, possibly get reference book.
- Little mobile app development experience (Easy)
  - Not familiar with Xamarin framework.
  - *Mitigation:* Watch tutorial videos and focus on prototyping.
- Not familiar with Intune / MS Graph (Hard)
  - Brand new software platform to all of us.
  - *Mitigation:* Discuss with our client in more detail, and dive into documentation.

Team Mozilla

Status Report

Asynchronize All The (Localization) Things!

- Project Overview
  - Mozilla is a globally available browser attempting to reach more users by providing localized translations to Mozilla dialog boxes, warning/message tabs, and all other browser pop-ups viewed by end user.
  - Work with Mozilla development team to create a run time string translation method used on all current Mozilla browsers
  - Use Fluent, xhtml, and JavaScript to edit current open source files.
- Project Plan Document
  - We have already started it.
  - Skeleton built and some schedule added.
  - 10% completed.

Team Mozilla

Status Report

Asynchronize All The (Localization) Things!

- Server Systems / Software
  - Most services are hosted by Mozilla:
    - Code repositories: nightly, beta and finished releases
    - SearchFox.org to quickly search Firefox code base
  - IRC Cloud
    - Used for internal communication

- Development Systems / Software
  - Develop and build on local machine
  - Bugzilla for bug tracking
  - Mercurial for version control

Team Mozilla

Status Report

[3 of 4]

Asynchronize All The (Localization) Things!

- Client Contact
  - Majority via IRC .
  - Conference calls every Friday at 1 pm since beginning of semester. In-person meeting scheduled for Sep 15/16.
- Team Meetings
  - 8 times in-person.
  - Team meetings every couple of days.
- Team Organization
  - All members are currently working on Fluent-related bugs:
    - Collin: about:profiles
    - Jack Smith: Primary mentor contact and about:url-classifiers
    - Jack Song: about:about
    - Jim: about:config
    - Raza: Secondary mentor contact and about:restart-required

Team Mozilla

Status Report

[4 of 4]

Asynchronize All The (Localization) Things!

Risks

- Lots of files
  - The code base is so large we may not have time to update every instance to fluent (at minimum thousands of instances)
  - The project is broken into individual bugs, so even if we do not update every file, or miss certain files, our work is still being submitted and used
- Large existing code base
  - It will take a lot time to understand relevant aspects of the code base
  - The meeting on the 15th and 16th will help give us an overview
- Slow startup
  - Our changes could slow down startup time, and be burdensome to solve
  - Mozilla uses automated testing to measure startup time
- Unfamiliar technologies
  - Most members of our team are unfamiliar with some of the technologies being used
    - Fluent, JavaScript and Mercurial specifically
  - We're poring over the documentation and asking our mentors questions as we go

Team MSUFCU

Status Report

[1 of 4]

Transaction Anomaly Detection

- Project Overview
  - Visualize MSUFCU members' spending habits
  - Send alerts about unusual account activity
  - Leverage machine learning and data science to provide services to customers
  - Develop web, Android, and iOS platforms for anomaly detection
- Project Plan Document
  - Rough draft in progress
  - We have started writing and creating screen mock-ups for the status report
  - Functional and design specification sections have been completed along with screen mock-up drafts
  - ~30% complete

Team MSUFCU

Status Report

[2 of 4]

Transaction Anomaly Detection

- Server Systems / Software
  - Hosting server with Amazon Web Services
  - Website and database will be hosted on AWS
  - AWS server is currently running and we have SSH access, website and database will be configured when we have AWS account login
- Development Systems / Software
  - Python with data science libraries (Pandas, scikit-learn, etc.)
  - Downloaded Android Studios for member facing Android portal
  - Downloaded Xcode and reference manuals for iOS development

Team MSUFCU

Status Report

[3 of 4]

Transaction Anomaly Detection

- Client Contact
  - Met with entire client team at MSU library
  - Scheduled on-site visit for Friday and will establish weekly meeting time
- Team Meetings
  - Team meetings twice weekly
  - To date we have had 5 team meetings
- Team Organization
  - Assigned tasks to members for various project subsections
  - Set up a team Trello board to help with development workflow

Team MSUFCU

Status Report

[4 of 4]

Transaction Anomaly Detection

Risks

- Risk 1
  - Don’t know how to detect anomalies
  - We have run preliminary trials and will continue to research detection methods
- Risk 2
  - Don’t have access to MSUFCU transactional data
  - We have access to the database schema and will gain access to actual data in the near future
- Risk 3
  - We don’t have access to AWS account portal to set up database on server
  - We have reached out to James to get access to the portal and have found tutorials to get database running once we have access
- Risk 4
  - We are inexperienced with Android and iOS app development
  - We have XCode and Android Studios installed and are going through tutorials

Team Proofpoint

Status Report

[1 of 4]

Improved Detonation of Evasive Malware

- Project Overview
  - Malware is getting smarter
  - Capable of evading sandbox environments
  - Identify malware whose payloads deviate in quarantine
  - Modify malware payload to execute in sandbox
- Project Plan Document
  - Document Outline
  - Functional Specs 1st Draft Completed
  - 10% completed

Team Proofpoint

Status Report

[2 of 4]

Improved Detonation of Evasive Malware

- Server Systems / Software
  - Proofpoint providing on-site lab that is already configured
  - VMWare ESXi hypervisor
  - Access available week of 9/10
- Development Systems / Software
  - Partly pre-provided malware samples – provided by Proofpoint
  - Partly Visual C/C++ malware samples – behavior tests completed
  - Cuckoo detonation environment – in Proofpoint infrastructure
  - Python for malware analysis – not yet started
  - Flask for web interface – not yet started

Team Proofpoint

Status Report

[3 of 4]

Improved Detonation of Evasive Malware

- Client Contact
  - Monday 4:30pm weekly conference calls (Brad & Yash)
  - Contingent Friday meetings
  - 9/6 Proofpoint tech demo
  - 9/21 in-person extended day meeting
- Team Meetings
  - 4 meetings thus far
  - Meet Monday, Wednesday, Friday
- Team Organization
  - Ryan & Ian: Malware Analysis, Reverse Engineering
  - Sean, Jack, & Tae: Web UI & API
  - Ian: Client Contact

Team Proofpoint

Status Report

[4 of 4]

Improved Detonation of Evasive Malware

- Risks
- Reverse Engineering Difficulty
  - Converting executable files to readable code is complex
  - Browse a variety of existing tools that perform this function
- Malware in Multiple Languages
  - Behavior analysis is tedious considering a wide range syntaxes
  - Start with small, simpler samples of malware & limit project scope
- Navigating Proofpoint's lab
  - We will work in a provided environment – environment could be rigid
  - Familiarize as soon as possible & propose changes early, Yash's assistance
- Malware Samples Evade through Unknown Means
  - Unfamiliar with how malware recognizes quarantine environment
  - Analyze known evasive samples, find relevant code

Team Quicken Loans

Status Report

[1 of 4]

Walter, You Gotta Go

- Project Overview
  - Mock a legacy application
  - Create a ‘virtual worker’ for the legacy application
  - Write a modern replacement application
  - Integrate the new application to work with the old
- Project Plan Document
  - Initial template and table of contents have been established
  - Initial draft of functional specifications completed
  - Began working on screen mockup and system architecture model

Team Quicken Loans

Status Report

[2 of 4]

Walter, You Gotta Go

- Server Systems / Software
  - Azure SQL database
  - VSTS code repository deployed and configured
- Development Systems / Software
  - Angular with Spark UI
  - C# API with GraphQL
  - .NET WinForms
  - UIPath for RPA

Team Quicken Loans

Status Report

[3 of 4]

Walter, You Gotta Go

- Client Contact
  - Set up weekly meetings on Wednesday afternoons
  - Scheduled an on-site visit
  - September meetings may need rescheduling
- Team Meetings
  - Triage meetings on Friday and team meetings on Sunday
  - Regular online communication via Slack
- Team Organization
  - Tasks assigned amongst teammates for alpha build
  - Configured Slack, Trello, VSTS and Azure online tools

Team Quicken Loans

Status Report

[4 of 4]

Walter, You Gotta Go

Risks

- Understanding RPA
  - We need a more in-depth understanding of RPA
  - Watch tutorials for RPA (UIPath) tools and how they work
- Understanding GraphQL
  - We do not have experience with GraphQL
  - We will research how to integrate .NET APIs with GraphQL
- Scope Creep
  - Adding non-essential features too early in the process
  - Designate non-essential features as stretch goals to complete later
- Integrating Azure Tools
  - We need to figure out how to get each part of the project to communicate with each other
  - Put more effort into connecting the different pieces earlier in the project

Team Spectrum Health

Status Report

[1 of 4]

Spectrum Health Virtual Reality Experience

- Project Overview
  - Web-based VR navigation solution
  - Visual assistant for patients and visitors
  - Website access along with VR capabilities
  - Admin access and future scalability
- Project Plan Document
  - Project document created but not implemented
  - Document skeleton created
  - Schedule outline created
  - 10% finished

Team Spectrum Health

Status Report

[2 of 4]

Spectrum Health Virtual Reality Experience

- Server Systems / Software
  - VSTS starter project created
  - Azure will be used for storage
  - Logins and Git provided to team
- Development Systems / Software
  - A-Frame prototype created
  - Website mockup and CSS style guide
  - Team will scale starter code

Team Spectrum Health

Status Report

[3 of 4]

Spectrum Health Virtual Reality Experience

- Client Contact
  - Meet with client onsite at Spectrum IT Office
  - Weekly WebEx conference calls Tuesdays at 11am
- Team Meetings
  - Our team meets M/W after 8PM, TU/TR at 10am
  - At least one all hands meeting, smaller meetings through the week
- Team Organization
  - Client Contact / UX Developer - Jordan Hill
  - Web Developer - Anthony Flattery
  - Mobile Developer - Stefani Taskas
  - Web Designer- Jeremy Du

Team Spectrum Health

Status Report

[4 of 4]

Spectrum Health Virtual Reality Experience

Risks

- Risk 1
  - Slow start on project
  - Spectrum Health is providing a starter project which should assist with getting development up and running quickly.
- Risk 2
  - Additional VR motion controller support
  - Scale back additional feature requests, limit scope to original project proposal, leave controller support as a cuttable feature
- Risk 3
  - Browser Compatibility
  - Limiting Browser support initially to Chrome only per request
- Risk 4
  - Uploading 360 picture and video content to server
  - Will take additional research to allow scalability

Team TechSmith

Status Report

[1 of 4]

TechSmith Video Review and Slack Integration

- Project Overview
  - Integrate TechSmith Video Review App with Slack
  - Cross platform communication
  - Preserve as much functionality as possible
- Project Plan Document
  - Started Skeleton Document
  - Titles, Starter Paragraphs, Initial Planning

Team TechSmith

Status Report

[2 of 4]

TechSmith Video Review and Slack Integration

- Server Systems / Software
  - Serverless - Microsoft Azure
  - Node.js + Azure Functions
- Development Systems / Software
  - Slack API
  - Video Review API
  - Docker
  - ngrok
  - Swagger

Team TechSmith

Status Report

[3 of 4]

TechSmith Video Review and Slack Integration

- Client Contact
  - We have met with our client in person
  - Scheduled meetings every Friday at 1 p.m.
- Team Meetings
  - Met five times up to today
  - Team meetings are Monday, Wednesday, and Friday
- Team Organization
  - 2 Slack side, 1 Video Review, 2 Proxy Server

Team TechSmith

Status Report

[4 of 4]

TechSmith Video Review and Slack Integration

Risks

- Exploratory Nature
  - How much is possible? How many features can be integrated?
  - Slack/Video Review API Research
- Access to Application Source Code
  - Need to alter application source code for full integration
  - Contact TechSmith project owner for access
- Data Loss/Corruption
  - Preserving accurate and complete data through Video Review integration
  - Testing
- Scalability
  - Creating a scalable proxy to be used for future messaging apps
  - Strong design patterns

Team Union Pacific

Status Report

[1 of 4]

Augmented Reality Mechanic Training

- Project Overview
  - Build a train
  - Instruct a user how to assemble a train by recognizing objects
  - Learn about machinery
  - Allow a user to inspect 3D CAD models with HoloLens
- Project Plan Document
  - Skeleton is created
  - General layout complete
  - 20% complete

Team Union Pacific

Status Report

[2 of 4]

Augmented Reality Mechanic Training

- Server Systems / Software
  - None
- Development Systems / Software
  - Unity with Mixed Reality Toolkit is up and running
  - HoloLens set up and deployed to
  - PiXYZ working for immediate purposes
    - Currently conflicting with Mixed Reality Toolkit
  - Vuforia solutions being researched

Team Union Pacific

Status Report

[3 of 4]

Augmented Reality Mechanic Training

- Client Contact
  - Talked with and established a weekly conference call at 3 pm on Fridays
  - Have met in person but have not scheduled a trip to the client's office yet
- Team Meetings
  - Have met as a team multiple times a week since forming
  - Thursdays at 4:30 pm weekly meeting
- Team Organization
  - All team members working in Unity and individuals specializing by technology
  - Assigned project manager and client contact

Team Union Pacific

Status Report

[4 of 4]

Augmented Reality Mechanic Training

Risks

- Vuforia (High)
  - Complications and limitations with various detection methods
  - Investigating and building test applications for 3 solutions
- Lack of Documentation (Medium)
  - Because HoloLens is new and experimental, not a lot of information is widely available and up to date, especially with how it interacts with various software
  - Experimentation, research, and contacting developers
- PiXYZ (Low)
  - Currently PiXYZ and Mixed Reality Toolkit cannot be built in same project
  - Removing PiXYZ files before build works; contacting developers for assistance

Team United Airlines

Status Report

[1 of 4]

Tooling Kit Content Verification System

- Project Overview
  - Mobile application to verify aircraft tooling kit contents
  - Used by technicians at repair facility
  - iOS with companion Web application
  - Utilize computer vision to recognize tools
- Project Plan Document
  - Functional specs (Use case, Client Problem and solution)
  - Recognized major risks
  - Decided on team roles for Teamwork section
  - 25 percent complete with initial draft

Team United Airlines

Status Report

[2 of 4]

Tooling Kit Content Verification System

- Server Systems / Software
  - Ubuntu server hosted at MSU
  - Installed September 10, 2018
  - May change to use United servers
- Development Systems / Software
  - iOS application built in Swift 4
  - Django web framework back-end
  - Database tech undecided

Team United Airlines

Status Report

[3 of 4]

Tooling Kit Content Verification System

- Client Contact
  - Have held 2 conference calls with United clients
  - Intend to fly to O'Hare in upcoming weeks
- Team Meetings
  - Monday/Wednesdays 5pm
  - We have had 3 team meetings
- Team Organization
  - Main Client Contact: Vlad
  - IOS developers: Andy, Bill, Vlad
  - OpenCV: Evan, Scott
  - Webframe: Evan
  - GUI Design: Vlad, Andy

Team United Airlines

Status Report

[4 of 4]

Tooling Kit Content Verification System

- Risks
- No Computer Vision Experience
  - Application must be able to recognize tools and kits
  - 2 team members assigned to CV at start
- Uncertain Database Requirements
  - Currently unclear what data our system will be required to store
  - Setting up database on our server as fallback.
- Meeting Times
  - Schedule clashes between team members have restricted whole group availability
  - Intend to use slack channels, remote calls where possible
- No Sample Images/Kits yet
  - We do not yet have access to a tool kit or set of images of any tools
  - Team members will be flying to ORD to collect sample images

Team Urban Science

Status Report

[1 of 4]

VIN-Verse

- Project Overview
  - Develop software that increases the availability of a vehicle's history through robust integrations and verified self-reporting to streamline vehicle history management
  - Authorize temporary access to vehicle history
  - Register new service facilities to the program
  - Display analytics on aggregated vehicle histories
- Project Plan Document
  - Skeleton built out
  - Sections have been assigned to team members
  - Hard due dates have been added to the schedule
  - 5% Complete

Team Urban Science

Status Report

[2 of 4]

VIN-Verse

- Server Systems / Software
  - Server assigned
  - Installation of Windows Server 2012 R2 completed
  - SQL Server still needed
  - 30% Complete

- Development Systems / Software
  - Visual Studio set up and ready for use
  - Microsoft SQL Server Management installed
  - Repository set up through GitLab
  - 70% Complete

Team Urban Science

Status Report

[3 of 4]

VIN-Verse

- Client Contact
  - Have had first two meetings with client and will hold conference calls every Tuesday morning.
  - Plan to visit their office September 28th
- Team Meetings
  - Have met 6 times so far
  - Triage meetings are scheduled for 5pm Monday, team meeting to follow
- Team Organization
  - Rachel: client contact, back-end developer
  - Jacob: full-stack developer
  - Gabe: full-stack developer
  - Aakash: front-end developer, UX design

Team Urban Science

Status Report

[4 of 4]

VIN-Verse

Risks

- Risk 1
  - Down one team member
  - Efficiently prioritizing development goals and holding each other accountable
- Risk 2
  - Confidentiality of user data
  - Proper security protocol and hiding sensitive information
- Risk 3
  - Integration between web and mobile platforms
  - Mobile-friendly design in mind
- Risk 4
  - Verifying self-reported repairs
  - Uploading of receipts to verify self-repair

Team Volkswagen

Status Report

[1 of 4]

VW Car-Net Demo App

- Project Overview
  - Guided Car-Net demo/tutorial
  - Assist dealers in demonstrating the product value of Car-Net
  - Allow for potential customers to experience new Car-Net features
  - Get customers engaged with the Volkswagen brand
- Project Plan Document
  - Started on Sunday, Sept. 9
  - 15% done
  - Risks, Executive Summary, & Functional Specifications drafted
  - Currently writing Design Specifications

Team Volkswagen

Status Report

[2 of 4]

VW Car-Net Demo App

- Server Systems / Software
  - Mostly self-contained application
  - Interface with Firebase Analytics
  - Possible APIs may be accessed for marketing image/video content
  - Git VCS
- Development Systems / Software
  - Android Studio & Xcode -> installed/running 100%
  - Kotlin & Swift 4
  - SDKs & functionality -> making prototypes to learn EventBus/NSNotification, Retrofit, Firebase Analytics

Team Volkswagen

Status Report

[3 of 4]

VW Car-Net Demo App

- Client Contact

  Weekly client calls scheduled for Tuesday mornings from 10-11am
  - In person meeting at Volkswagen in Auburn Hills scheduled for Friday, September 14th.
- Team Meetings
  - Team has met 7 times so far
  - Weekly team meetings are scheduled for Tuesday/Wednesday/Thursday mornings, and Sunday afternoons
- Team Organization
  - Emily is our client contact
  - Emily, Tim, and Kira are on Android development
  - Zebin and Cyprian are on iOS

Team Volkswagen

Status Report

[4 of 4]

VW Car-Net Demo App

Risks

- Emulate Car-Net features
  - In order to allow the user to experience Car-Net features in the demo app, we need to understand how they work within the Car-Net mobile app
  - Getting access to test accounts/codebase & visiting VW campus Friday to experience the Car-Net mobile app in person
- Images/Video Content costs
  - High storage/network cost could slow the app down or make it too large
  - Build prototypes to investigate AVPlayer/MediaPlayer streaming functionality
- SnapKit for iOS
  - Use SnapKit over iOS Storyboards for UI design
  - Reading SnapKit docs/Building test UIs
- Identical UX for iOS/Android
  - Both apps need to exhibit the same behavior and appearance
  - We'll be working with our UX contacts at VW

Team Whirlpool

Status Report

[1 of 4]

Image Recognition Annotation and Validation Mobile App

- Project Overview
  - Capture pictures of recipe ingredients and annotate said ingredients.
  - Validate annotated submissions of other users through a game.
  - Allow for use on Android and IOS platforms
  - Create specialized dashboard for administrators
- Project Plan Document – 15%
  - Base Template Created – 100%
  - Cover Page Completed – 100%
  - Section Role Assignments
  - Schedule Section – 25%
  - System Architecture – 40%
  - First UI Design Mock-Ups- 100%

Team Whirlpool

Status Report

[2 of 4]

Image Recognition Annotation and Validation Mobile App

- Server Systems / Software
  - Google Cloud Storage access pending
  - Google DataStore/Firebase access pending
  - Yummly Api - Integration after alpha completion
- Development Systems / Software
  - GitRepo – repos for iOS & Android
    - SourceTree – synchronizing versions
  - Xcode/Swift – deployed, hello world running
  - Android Studio – deployed, hello world
  - TensorFlow Lite –Researched object detection

Team Whirlpool

Status Report

[3 of 4]

Image Recognition Annotation and Validation Mobile App

- Client Contact
  - Initial meeting: 9/5/2018
  - Weekly Conference calls every Wednesday @ 4:45pm
- Team Meetings
  - Triage Meetings every Tuesday @ 9:30am
  - Official Team Meetings Sunday @ 3:30pm
    - Outside of official meets it's presumed to be working throughout the week after class but maybe not all at the same time
  - Team Meeting count: 5
- Team Organization
  - **Shruti Avutapalli** – iOS Dev, UX Client Contact
  - **Jessica Clappison** – Android Dev, TensorFlow Lead
    -Trello Scrum Master
    - » Starting week 3
    - » Rotation on a weekly basis
  - **Jackie Li** – Android Dev, Sever Side Lead
  - **Savanna Pinkoski** – iOS Dev, Server Side Lead
  - **Jack Turak** – UX, TensorFlow Lead

Team Whirlpool

Status Report [4 of 4]

Image Recognition Annotation and Validation Mobile App

Risks

- iOS - Swift Development – **Medium**
  - **Description :** Overall development – working with CocoaPods and machine learning libraries in Xcode environment
  - Mitigation : Requested online book order
  - Mitigation : Watching online-class-tutorial videos
- Object detection in image – **High**
  - **Description :** Distinguishing between multiple objects in a single image
  - Mitigation : Researching and Implementing TensorFlow
  - Mitigation : Reach out to other peers who are familiar with TensorFlow
- Suboptimal System Architecture – **Low**
  - **Description :** Reconciling between traditional MySQL Database structure or Google DataStore
  - Mitigation : Present diagram at client meeting
  - Mitigation : Get advice/approval through client
- Image Storage – **Low**
  - **Description :** What is the best/optimal way to store captured images? How?
  - Mitigation : Avoid storage image directly
  - Mitigation : Use pathway to image

What's ahead?

[1 of 2]

All-Hands Meetings

- ~~08/29: Capstone Overview~~
- ~~09/05: Capstone Overview~~
  ~~Project Plan~~
  ~~Team Photos: Teams Amazon – Mozilla~~
- ~~09/10: Risks and Prototypes~~
  ~~Team Photos: Teams MSUFCU - Whirlpool~~
- 09/12: ~~Team Status Report Presentations~~
- 09/17: Resume Writing and Interviewing
- 09/19: Schedule and Teamwork
- 09/24: Team Project Plan Presentations
- 09/25: MSU Fall Career Days (formerly Career Gallery)
- 10/15: Team Alpha Presentations

What's ahead? [2 of 2]

- Project Plan Documents and Presentations
  - PowerPoint Template
    - Download Now
    - Read the Read Me Slides (Over and Over and Over…)
  - Submission
    - Both Project Plan Document and PowerPoint Slide Deck
    - Due 12:01 a.m., Monday, September 24 ← **Get on this now!**
    - See Submission Instructions in Template
  - Presenting
    - 5 Teams Per Meeting Over 4 Meetings
    - Schedule Posted Sunday Evening
    - Strict 13 Minute Time Limit
    - Use Team Member Laptop
      - Bring Power Cord
      - Test In Meeting Room (in Advance)
    - Rehearse
    - 5% of Final Grade
    - Business Casual Dress ← **Nota Bene!**
  - Formal Team Photos
    - Immediately Following Meeting
    - In Capstone Lab
  - Schedule Conflicts
    - Only for Interview Trips or Grace Hopper
    - Notify Dr. D. and your TA well in advance.