MICHIGAN STATE UNIVERSITY

01/18: Team Status Reports

The Capstone Experience

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Spring 2018

From Students…
…to Professionals

Team Accenture

Status Report

[1 of 4]

AMAP: Automated Malware Analysis Platform

- Project Overview
  - Having 268 million malware samples and growing at 300k per day.
  - Catagorize based on types, detection signatures byte patterns etc.
  - Storing revalent information of samples in database.
  - Results could be more samples of IP addresses and domains targeted.
- Project Plan Document
  - Getting forward on technical specifications with client this week.
  - Have a general outline.
  - Most of the functional specifications just figured out.
  - Overall progress: ~10%.

Team Accenture

Status Report

[2 of 4]

AMAP: Automated Malware Analysis Platform

- Server Systems / Software
  - Windows 10 VM
  - Ubuntu VM (Waiting to receive from client)
  - Amazon AWS (Waiting to receive from client)
- Development Systems / Software
  - iDefence IntelGraph (API access)
  - iDefence Malware repository.
  - Database (MongoDB, MySQL)

Team Accenture

Status Report

[3 of 4]

AMAP: Automated Malware Analysis Platform

- Client Contact
  - Contacted with client last Thursday (in person).
  - Daily communication on Slack.
- Team Meetings
  - Had 4 team meetings
  - Plan to meet twice a week.
- Team Organization
  - Client contact Andrew.
  - Rotate team lead.
  - Every team member is considered a developer.

Team Accenture

Status Report

[4 of 4]

AMAP: Automated Malware Analysis Platform

Risks

- Risk 1
  - Can we actually identify malware?
  - Looking up how malware stored in the different file types.
- Risk 2
  - Can we actually find how one malware sample connected to another?
  - Learning how the iDefence tools can help detect patterns and malware samples.
- Risk 3
  - Can we properly use iDefence tools?
  - Using documentation from client.
- Risk 4
  - How to process in multi-threaded environment?
  - Looking tutorials on multi-thread programs.

Team Amazon

Status Report

[1 of 4]

AMPED

- Project Overview
  - Loyal, well-educated listeners
  - Episode sponsors provide the main source of revenue
  - Primary goal: recommend relevant amazon products based on podcast audio content
  - Content producers will receive commission on recommended item revenue
  - Machine learning model and robust API are top priority
  - Front end and UI are secondary
- Project Plan Document
  - Functional specifications well defined by client
  - Primary features identified
  - System components identified
  - System architecture diagram outlined
  - Risks/mitigation identified
  - ≈ 40% Complete

Team Amazon

Status Report

[2 of 4]

AMPED

- Server Systems / Software
  - AWS EC2, RDS, Elasticache, S3, Beanstalk (Infrastructure)
  - AWS Lambda, API Gateway, Route 53 (Front-end facility)
  - AWS Transcribe, Comprehend, SQS, SNS (Middle-ware)
- Development Systems / Software
  - Ubuntu Server, GitLab.MSU, Google Drive, Slack, Trello
  - JavaScript, Python, AWS Services and APIs
  - Web application first, with portability in mind

Team Amazon

Status Report

[3 of 4]

AMPED

- Client Contact
  - Remote conference call, 9:00 AM every Friday
  - In-person meetings are planned
- Team Meetings
  - Three set meeting times per week
  - 1 Hour meetings
- Team Organization
  - Front-end focused workgroup
  - Back-end focused, and research workgroup

Team Amazon

Status Report

[4 of 4]

AMPED

Risks

- Risk 1
  - Recommending an item which has been negatively described
  - Machine learning and sentiment analysis (feature of AWS Comprehend)
- Risk 2
  - Controversial or inappropriate subjects
  - Blacklist specific terms, utilize ‘IsAdultProduct’ attribute included in API
- Risk 3
  - Portability, deployment, scalability
  - Separation between back-end (APIs) and front-end (UIs)
- Risk 4
  - Statistics and revenue reports for podcasters (stretch goal)
  - Utilize Amazon affiliate program for purchase tracking

Team Aptiv

Status Report

[1 of 4]

Cyber Security Management System

- Project Overview
  - Interdepartmental communications/information sharing suite
    - Information sharing between developer and security teams
  - Automation of the entire cybersecurity process
    - Assessment request
    - Threat Analysis & Risk Assessment (TARA)
    - Vulnerability/Penetration Assessment
    - Vulnerability Remediation
    - Final Report
- Project Plan Document
  - Not started
    - Client changed the full project proposal several times

Team Aptiv

Status Report

[2 of 4]

Cyber Security Management System

- Server Systems / Software
  - WebApp
    - Javascript
    - HTML,CSS
    - PHP
  - Database
    - MySQL
  - Vmware ESXi – Hypervisor (VM Platform)
- Development Systems / Software
  - WebStorm/PHPStorm
  - Git repo

Team Aptiv

Status Report

[3 of 4]

Cyber Security Management System

- Client Contact
  - Weekly Conference Calls (x2)
    - Tuesdays 2:00-2:45pm
- Team Meetings (x2)
  - Reviewed client proposal
  - Change project proposal
  - Met with Dr. Enbody/Pranshu Bajpai
  - Weekly Team Meetings
    - Monday 4:30-6pm
- Team Organization
  - Developing the Cyber Security Management System

Team Aptiv

Status Report

[4 of 4]

Cyber Security Management System

Risks

- Application security
  - Software/Database will hold all of Aptiv's data (schematics, software, vulnerabilities, etc.) for all of their products
  - Project advisors (Pranshu/Enbody) have commercial web app pen-testing experience, and we will be implementing best practice security measures as we develop the system
- Database Implementation
  - Best way to design a database to accommodate fast retrieval, and manage information for user-base with a wide range of specific permissions
  - Focus initial development on strong database design instead of focusing on other things like the UI
- Knowledge of client procedure
  - No knowledge of client complex process from start to finish vulnerability testing
  - Reviewing documentation, close contact with client while constant prototyping
- Scalability issues with users
  - How well the database will handle multiple users doing the same operations
    - Aptiv has 147,000 employees
  - Use a cloud service (Amazon) instead of in-house servers to handle workload

Team Auto-Owners

Status Report

[1 of 4]

IMAGINE: IMAGe INtake Experience

- Project Overview
  - Object recognition and classification of physical environments for insurance purposes
  - Users load 360^{o} images into web application
  - Web-viewable database for inventory of identified objects
  - Unity VR application to fully experience the environment
- Project Plan Document
  - Have begun rough draft of Project Plan Document
  - Currently reviewing project requirements, calculating risks and mitigation strategies, and designing overall system architecture
  - Confirming overall plan with client on 1/19
  - 20% Complete

Team Auto-Owners

Status Report

[2 of 4]

IMAGINE: IMAGe INtake Experience

- Server Systems / Software
  - Capstone Server with Ubuntu Server – Up but Firewall Issues
  - Apache Web Server with PHP – Up and Configured
  - MariaDB – Up and Configured but potential Firewall Issues
- Development Systems / Software
  - Unity Game Development Studio- Configuring
  - Windows Machine with Oculus Rift and Controllers – Acquiring (Oculus Rift and Controllers have been acquired)
  - OpenCV and TensorFlow - Configuring

Team Auto-Owners

Status Report

[3 of 4]

IMAGINE: IMAGe INtake Experience

- Client Contact
  - Met with client at their headquarters in Lansing, MI on Monday 1/15/2018 from 11:30am to 1:30pm.
  - Plan to have weekly conference calls on Fridays at 11:30am
- Team Meetings
  - Have had three team meetings thus far
  - Official team meetings are planned for Thursday after class
- Team Organization
  - Tasks will be specialized between members
  - 3 groups – Classifier Systems, Virtual Reality, Web Interface

Team Auto-Owners

Status Report

[4 of 4]

IMAGINE: IMAGe INtake Experience

Risks

- Object recognition in spherical images
  - 3D images have distorted pixel densities and will make classifying difficult
  - Normalize 3D images to 2D or include warped images when training our classifier
- Inability to classify an environment
  - Environments should be classified based on types of objects found (i.e. bedroom, office, etc.)
  - Train negative classifiers to drop incompatible environments
- Multiple concurrent users
  - Multiple separate workflows will need to be able to be accessed by all users
  - Manage interactions with a user system using transactions to enforce ACID
- Server Access Limited by MSU Firewall
  - MSU has unknown firewall rules that prevent some outside communications
  - Determine what is prohibited and pipeline traffic through approved channels

Team Dow

Status Report

[1 of 4]

Virtual Reality Simulation for Railcar Loading

- Project Overview
  - Teach How to Load a Railcar Safely
  - Achieved Through First Person Virtual Reality
- Project Plan Document
  - Table of Contents Finished
  - Executive Summary Started
  - Risk Analysis Finished
  - Schedule Drafted
  - 20% Complete

Team Dow

Status Report

[2 of 4]

Virtual Reality Simulation for Railcar Loading

- Server Systems / Software
  - No Servers
- Development Systems / Software
  - Computer with GTX 1060 or better (obtained)
  - HTC Vive Headset (obtained)
  - Unity Game Engine (installed)
  - Maya 3D (installed)
  - Photoshop CS6 (installed)
  - Audacity (installed)

Team Dow

Status Report

[3 of 4]

Virtual Reality Simulation for Railcar Loading

- Client Contact
  - Emailed twice and had conference call
  - Weekly conference calls Friday at 12:30pm
- Team Meetings
  - Weekly meetings on Tuesdays at 4:30pm
  - Weekly meetings with Johnny on Thursdays at 4:40pm
- Team Organization
  - Using GroupMe group chat for instant communication
  - Using Trello for project role/tasks organization

Team Dow

Status Report [4 of 4]

Virtual Reality Simulation for Railcar Loading

Risks

- Unity Game Engine
  - Description: Understand development with Unity
  - Mitigation: Follow online tutorials through Unity, websites, YouTube, etc.
- Vive VR Development
  - Description: Understand how HTC Vive works with Unity and what works in a VR environment
  - Mitigation: Follow online tutorials, build test scenes for basic VR interaction
- Project Assets
  - Description: Acquiring realistic models and sounds for development
  - Mitigation: Search Unity Asset store and royalty free websites for assets
- Accurate Simulation
  - Description: Accurately replicating scenario of loading railcars
  - Mitigation: Watch/analyze videos of proper railcar loading/filling

Team DRIVEN-4

Status Report

[1 of 4]

2020 Business in a Box

- Project Overview
  - Base on Internet of Things (IoT) architecture
  - Showcase future business environment with 2020 as target
  - Model a connected product utililizing Wi-Fi for connectivity
  - Develop manufacturing processes and artifacts
  - Demonstrate capabilities for collaboration and integration
- Project Plan Document
  - Have not started

Team DRIVEN-4

Status Report

[2 of 4]

2020 Business in a Box

- Server Systems / Software
  - No server needed
- Development Systems / Software
  - CAD – Siemens NX, PTC Creo
  - PLM – Siemens Teamcenter, PTC Windchill
  - IoT Platform – PTC Thingworx, Siemens MindSphere
  - AR/VR – PTC Thingworx Studio
  - Factory Floor Simulation – Siemens Tecnomatrix
  - Waiting on access

Team DRIVEN-4

Status Report

[3 of 4]

2020 Business in a Box

- Client Contact
  - Conference calls scheduled for Fridays at 1pm
    - One so far
  - In-person meeting scheduled for Thursday 11/18
- Team Meetings
  - Two so far
  - Weekly meetings on Wednesdays
- Team Organization
  - Client Contact – Sam Coffey
  - Technical roles not defined at this time

Team DRIVEN-4

Status Report

[4 of 4]

2020 Business in a Box

Risks

- Embedded Software Design Experience
  - No team members have experience with embedded software design
  - Individual research and training from DRIVEN-4
- Product Use Visualization
  - No team members have experience with visualization design
  - View examples provided by DRIVEN-4 and research visualization design fundamentals and samples
- Hardware Familiarization
  - Can’t get familiarized with hardware until received
  - Meeting scheduled to receive hardware
- Hardware-Software Interaction
  - Need to determine how to get devices interacting
  - Get training from DRIVEN-4 once devices received

Team GM

Status Report

[1 of 4]

Plato

- Project Overview
  - Artificially Intelligent Dev Bot for Microsoft Teams
  - Create and Manage Virtual Machines via Bot and Web App
  - Manage and Run Test Cases
  - Provide Single Unified Environment for Developers
- Project Plan Document
  - 20% complete
  - Outline done, schedule done
  - Working on database schema, system diagram, architecture
  - Working on functional and design specifications

Team GM

Status Report

[2 of 4]

Plato

- Server Systems / Software
  - Obtained Microsoft Teams Account from GM
  - Setup Microsoft Team for testing
  - SQLServer Standard 2017 getting set up
- Development Systems / Software
  - VMWare and Windows 10 installed on both iMacs
  - Visual Studio, Azure, and Microsoft Teams installed
  - Hello World Bot written with MBF

Team GM

Status Report

[3 of 4]

Plato

- Client Contact
  - Established Weekly meeting (Tuesday 9 - 10AM)
  - Requirement specification meeting tomorrow 1-2PM
  - Have had 2 total client meetings
- Team Meetings
  - First Triage meeting before class at 2:20PM
  - 3 total team meetings
  - Team meetings scheduled for 4:30-5:00PM Tuesday/Thursday – more to come.
- Team Organization
  - Client Contact/Project Manager: Colin Coppersmith
  - Web Application Development: Tao Tao/Colin Coppersmith
  - Backend and Bot Developer: Matthew Eaton/Simeon Goolsby/Alex Lepird

Team GM

Status Report [4 of 4]

Plato

Risks

- Controlling and managing Virtual Machines programatically
  - Description: No experience with CRUD using a programming language.
  - Mitigation: Use C# backend to communicate with Azure.
- Implementing acceptable language processing to ensure bot can understand commands effectively
  - Description: Thousands of ways to execute each command.
  - Mitigation: Use grammars and NLP to fill in the blanks.
- Integrating Microsoft TFS to automate Test case creation and testing
  - Description: GM uses TFS to test applications, no experience using it.
  - Mitigation: Gather unit tests from GM, try to emulate style.
- Customizing bot interaction based off team/ individual user
  - Description: Need to tailor to the needs of each team/user.
  - Mitigation: Using emails/IDs to determine which user against records.

Team Herman Miller

Status Report

[1 of 4]

AR Adjust App

- Project Overview
  - Native iOS app for customers using Herman Miller adjustable office chairs
  - Augmented Reality detects and identifies model of chair from camera
  - AR technology highlights adjustable parts and shows tooltip descriptions of adjustments for that model
- Project Plan Document
  - Writing the rough draft
  - Overall ~10% complete
  - Basic points on the design, functional and technical specifications
  - Early screen mockups

Team Herman Miller

Status Report

[2 of 4]

AR Adjust App

- Server Systems / Software
  - Windows Server – Setting up currently
  - Git for source control
- Development Systems / Software
  - Unity3d – Up and running
  - Vuforia (for AR) – Testing, awaiting on approval for pro license
  - Xcode – Up and running

Team Herman Miller

Status Report

[3 of 4]

AR Adjust App

- Client Contact
  - Team visited office in Zeeland, Michigan and met with team / toured chair facility
  - Weekly conference meetings scheduled with Herman Miller team members, planning second and final on-sites
- Team Meetings
  - Tuesdays before class
  - Client meetings Wednesday afternoon
- Team Organization
  - Client Contact / UI Developer – Kyle Kinsey
  - AR Developer – Mike Bremiller, Kevin Gaban
  - UI Developer – Jacob Weber, Han Huang

Team Herman Miller

Status Report

[4 of 4]

AR Adjust App

Risks

- Risk 1
  - Integrating Augmented Reality into the app
  - Testing different software solutions (Vuforia, Arkit)
- Risk 2
  - Ability to recognize chair model via camera
  - Obtaining physical chairs and pictures to train models
- Risk 3
  - Learning to develop for iOS devices
  - Developing application with Unity3d in C#, making basic Swift applications
- Risk 4
  - Cross platform app development
  - Using Unity and Vuforia (vs. Apple Arkit), which can create both native Android and iOS apps

Team Meijer

Status Report

[1 of 4]

Personal Shopping Assistant

- Project Overview
  - Simplify shopping experience (at home and in store)
  - Ask app instead of a team member
    - Item locations, availability, coupons, etc.
  - Create bot to answer natural language questions
  - Ensure API is universal, can be consumed for other projects
- Project Plan Document
  - Outline/Table of Contents finished
  - Shared via OneDrive for collaboration
  - 10% Complete

Team Meijer

Status Report

[2 of 4]

Personal Shopping Assistant

- Server Systems / Software
  - Microsoft Azure – have access
  - Meijer Web Services – do not have access yet, pending
  - SQL/Mongo Server(s) – not created/accessible yet
- Development Systems / Software
  - Android Studio – installed and running
  - Xcode – installed and running
  - Version Control – access pending

Team Meijer

Status Report

[3 of 4]

Personal Shopping Assistant

- Client Contact
  - Had 3 Conference Calls
  - Weekly 45 min. call scheduled (2:15-3 Thursdays)
- Team Meetings
  - Tuesdays 2-3
  - Met twice to get iMacs/VMs setup
- Team Organization
  - Corporate Contact – Zach
  - Android/Java – Emerson and Aaron
  - iOS/Swift – Megan and Jake
  - Bot Backend/C# Lead – Zach

Team Meijer

Status Report

[4 of 4]

Personal Shopping Assistant

Risks

- Bot
  - Need to implement a Natural Language bot
  - Zach will be dedicated lead for this section of the project but every team member will research and contribute
- Item location in each store
  - We'll need to determine where the item is in the store at which the customer is shopping.
  - Testing the app at several Meijer locations in the Lansing area to make sure the information is accurate.
- UI
  - Meijer has not settled on an app design (pure chatbot vs menus vs ?) and will require a large variety of screen mocks to make a decision
  - Will create lots of screen mockups and get feedback as often as possible
- Bluebird Integration
  - A stretch goal of this project is to incorporate team member assistance via bluebird devices.
  - Work with Meijer to get a device and communicate with team at Meijer who work with or develop for the devices. May be able to contact the vendor directly.

Team Michigan State University

Status Report

[1 of 4]

Student Engagement App

- Project Overview
  - Expand learning inside and outside of the classroom
  - Create a universal classroom response tool
  - Allow students to use mobile devices to engage
  - Streamline and simplify attendance
- Project Plan Document
  - Outline of document in place
  - Risks have been identified
  - Initial UI mockups have been created
  - Created development process

Team Michigan State University

Status Report

[2 of 4]

Student Engagement App

- Server Systems / Software
  - Set up Amazon Web Services with Flask and Python
  - Explored database and storage options (Dynamo, SQL, etc.)
  - Prototyped entity relationship diagram
- Development Systems / Software
  - Set up Android Development Environment and initial project
  - Set up iOS foundation and initial project
  - Started VUE project for web application

Team Michigan State University

Status Report

[3 of 4]

Student Engagement App

- Client Contact
  - Met in person at MSU, set up reoccurring meetings
  - Gathered initial requirements and resources
- Team Meetings
  - Plan to meet Tuesdays and Fridays to work together
  - Paired programming development
- Team Organization
  - Set up Slack for communication
  - Created Git group, and using Trello for progress tracking

Team Michigan State University

Status Report

[4 of 4]

Student Engagement

Risks

- iBeacon compatibility with Android
  - iBeacon technology was developed by Apple for iOS
  - Research existing Android libraries and create a basic app that can connect
- Create a positive experience for students AND faculty
  - Students and faculty have different priorities in classroom involvement
  - Conduct iterative user testing with both groups throughout development
- Align Amazon Web Services with required technology
  - Technology recommended by Amazon does not fulfill requirements of the app
  - Create a basic lab that utilizes all software
- Data input has to be scalable
  - Interaction from students will come in large portions at a time
  - Develop with scalability in mind and conduct rigorous testing with high volume.

Team Mozilla

Status Report

[1 of 4]

Mozilla

- Project Overview
  - Expand Firefox Theming API to allow for theming of previously unthemable browser aspects, like bookmarks and scroll bars.
  - Expand theming API to allow for Google Chrome extensions to be easily transitioned over as Firefox extensions
  - Create new themes for the Firefox browser
  - Resolve existing bugs and issues with the theming API
- Project Plan Document
  - Divided up work between team members
  - Started writing schedule of project milestones
  - Expect to have a first draft 1/26
  - 5% done

Team Mozilla

Status Report

[2 of 4]

Mozilla

- Server Systems / Software
  - All team members have the Firefox build environment downloaded and compiling on their systems.
  - All team members have received level 1 access to the Firefox codebase
  - All team members have created Bugzilla accounts and set up IRC chat.
- Development Systems / Software
  - Both iMacs have the Firefox codebase downloaded and compiling
  - Both iMacs have a Windows virtual machine running
  - Both iMacs have a Ubuntu Linux virtual machine running

Team Mozilla

Status Report

[3 of 4]

Mozilla

- Client Contact
  - We have emailed and met with our client
  - Weekly video conference call scheduled for 3:00 P.M. on Fridays
  - Hacking weekend with Mozilla on February 10 - 11
- Team Meetings
  - Tues/Thurs: 4:30pm; Mon: 5:30pm
  - Triage: Monday 2:20pm
  - Our team has met 6 times so far
- Team Organization
  - Vivek Dhingra is the client contact
  - Assigned tasks to each team member through Bugzilla ticketing system
  - Weekly team code review on Thursdays

Team Mozilla

Status Report [4 of 4]

Mozilla

Risks

- Large Codebase
  - Firefox codebase is over 35 million lines code, finding a place to start is challenging
  - Using the searchfox.com web tool to locate files of interest, rather than grep.
- Platform Testing
  - Need to efficiently code for all platform without breaking compatibility. Limited team experience with testing suites
  - Research and write basic tests in Mozilla's testing suite.
- API Experience
  - Unsure of the type of API (REST, SOAP, RPC). Limited team experience with API development.
  - Building a basic API once Mozilla's Theme API type is determined
- Theme Transitions
  - Need to ensure compatibility when transitioning themes from Google Chrome
  - Review resources to get a comprehensive understanding of Google Chrome themes. Additionally, build themes to further understanding

Team MSUFCU

Status Report

[1 of 4]

Digital Assistant and Personal Financial Coach

- Project Overview
  - Digital assistant and financial coach for MSUFCU members
  - Answers questions about member's financial situation
  - Gives members the ability to compare spending habits in same demographic
  - Members can take action on their account to request/transfer funds
- Project Plan Document
  - Created basic outline
  - Completed system architecture mockup
  - Started executive summary

Team MSUFCU

Status Report

[2 of 4]

Digital Assistant and Personal Financial Coach

- Server Systems / Software
  - Will receive necessary hardware from MSUFCU
  - Will receive access to database containing dummy accounts from MSUFCU
  - This database is for testing only, and is not connected to their main database
- Development Systems / Software
  - Installed necessary software on iMacs
  - Will receive previous source code from MSUFCU
  - Tested each program installed to verify they are working correctly

Team MSUFCU

Status Report

[3 of 4]

Digital Assistant and Personal Financial Coach

- Client Contact
  - Met with client and signed an IP agreement and Non-Disclosure Agreement
  - Discussed the resources that we will be using and the devices the client will be providing
- Team Meetings
  - Installed Android Studio, Xcode, PHPStorm, and VMWare on iMac
  - Planned weekly meetings at 5 PM on Tuesday and Thursday
- Team Organization
  - Client Contact and Project Manager (Rachel)
  - Machine Learning (Patrick)
  - Database (Dallas)
  - Web (Dane)
  - Mobile Apps (Michael)

Team MSUFCU

Status Report [4 of 4]

Digital Assistant and Personal Financial Coach

Risks

- Building off of Previous Code
  - This project is building off of work done by 2 previous capstone teams
  - We will work with clients to ensure our code works well with previous code; we will also contact old team members if necessary
- Working with Voice Recognition Software
  - No experience with voice recognition or speech-to-text
  - We will research best practices and use previous code to develop our knowledge
- Using Machine Learning to Make Predictions
  - Making comparisons between members of similar demographics requires machine learning techniques
  - We will research best methods for this type of data analysis and we will rely on clients to assist us.
- Integration of Android, Alexa, iOS, and Administrative Web App
  - Making these systems communicate with each other may prove to be difficult
  - We plan to use centralized database to maintain consistency between all different platforms

Team Phoenix Group

Status Report

[1 of 4]

Customer Service System with Chatbot

- Project Overview
  - Customer service team references paper manuals
  - Digitize manuals using tablet camera
  - Browse and manage manuals in ebook format
  - Chatbot to answer customer questions
- Project Plan Document
  - 10% of final plan complete
  - Functional specification first draft
  - System architecture first draft
  - Identified major risks

Team Phoenix Group

Status Report

[2 of 4]

Customer Service System with Chatbot

- Server Systems / Software
  - Linux installed on server
  - Built toy client/server application on local machine
  - Remote server access pending
- Development Systems / Software
  - Installed Windows and Visual Studio 2017
  - Tested C# hello world application
  - Created toy chat bot with Microsoft Bot Framework

Team Phoenix Group

Status Report

[3 of 4]

Customer Service System with Chatbot

- Client Contact
  - Weekly meetings on Fridays
  - Upcoming functional specification draft review
- Team Meetings
  - Weekly meetings on Tuesdays
- Team Organization
  - Server application: Fatema, Amanuel
  - Client application: Sarah, James
  - Web chat bot: Dan

Team Phoenix Group

Status Report

[4 of 4]

Customer Service System with Chatbot

Risks

- Use of Docker when shipping application
  - Lack of experience and compatibility issues
  - Mitigation: Containerize a toy application
- Image quality when composing eBook and running OCR
  - OCR system may require high image quality
  - Mitigation: test OCR performance on images taken with tablet
- Dataset size and system scaling
  - eBook size may be large, impacting performance
  - Mitigation: OCR speed tests, client-server data transfer speed tests
- Chat bot embedding in client website
  - Lack of experience
  - Mitigation: Embed prototype chat bot on WordPress site

Team ProofPoint

Status Report

[1 of 4]

Next Generation Malware Detection

- Project Overview
  - Reduce number of malware an analyst has to examine manually
  - Provide malware analysis dashboard for analysts
  - Produce real time signatures for malware undergoing dynamic analysis
  - Schedule malware analysis efficiently
- Project Plan Document
  - Estimated all but schedule and some technical specifications, under review by client
  - Project Plan outline is 75% done.
  - Wireframe for front end sketched
  - System architecture sketched

Team ProofPoint

Status Report

[2 of 4]

Next Generation Malware Detection

- Server Systems / Software
  - Web server – not set up awaiting client confirmation
  - SQL Server – not set up awaiting client confirmation
- Development Systems / Software
  - YARA, Cuckoo, Python – configured and tested
  - Suricata, ClamAV – Not yet
  - Linux, Windows, MAC OS – installed and configured

Team ProofPoint

Status Report

[3 of 4]

Next Generation Malware Detection

- Client Contact
  - Video conference call on Fridays starting January 12th
  - In person meeting scheduled on January 19th
- Team Meetings
  - Met 4 times so far
  - Weekly meetings – Wednesdays
- Team Organization
  - Brad is the client contact
  - Crystal is the project manager

Team ProofPoint

Status Report

[4 of 4]

Next Generation Malware Detection

Risks

- Clustering Malware
  - What metric(s) do we use to cluster similar malware.
  - Talk with analysts and/or client and research how malware can be clustered
- Scalability and Speed
  - How our program can efficiently analyze malware provided
  - Test speed of software and determine probability of dynamic analysis
- Processing Output of Software
  - Analyzing the output of the detection software that we are using
  - Prototype output parsing tools
- Constructing an API
  - Give a way for the Web App to interact with the analysis tool via an API
  - Research common ways to make an API and create a simple prototype API

Team Quicken Loans

Status Report

[1 of 4]

Fundamenta

- Project Overview
  - Web Application for construction of a house
  - Blockchain-based
  - Allows interactivity between builder, buyer, and contractors
  - Visual of workflow and transactions stored in the blockchain
- Project Plan Document
  - Sections assigned to each team member
  - Initial screen mock-ups completed and given to client
  - Functional specifications have been discussed with the client
  - Outlined and sections 20% complete

Team Quicken Loans

Status Report

[2 of 4]

Fundamenta

- Server Systems / Software
  - Azure
  - .NET (C#) backend
  - Private Ethereum blockchain initialized
- Development Systems / Software
  - React
  - Python (for blockchain)
  - Multiple “hello world” applications have been created

Team Quicken Loans

Status Report

[3 of 4]

Fundamenta

- Client Contact
  - Scheduled weekly meetings on Wednesday afternoons
  - On-site meeting scheduled January 31st
- Team Meetings
  - 6 team meetings so far
  - Scheduled weekly team meetings on Monday at 1 PM
- Team Organization
  - Frontend / UX (Erin and Turner)
  - Backend / Blockchain (Riley, Jaiwant, Vishal)

Team Quicken Loans

Status Report

[4 of 4]

Fundamenta

Risks

- Blockchain
  - Applicability of proof-of-work and mining
  - Create own blockchain and utilize in-house experts at Quicken Loans
- Ethereum-specific Challenges
  - Usage of smart contracts for this project
  - Have questions prepared for Friday call with client
- Setting Up Development Workflow
  - Getting all of the technologies up and running cohesively will be a challenge
  - Starting early, doing research, and asking questions
- Interaction with Database
  - Setting up the blockchain to interact with SQL Server
  - Small-scale testing with simple queries

Team Rook

Status Report

[1 of 4]

Endpoint Data Monitoring and Analysis Agent

- Project Overview
  - Agent captures event logs on end point hosts
  - Create web interface to configure agent
  - Analyze health metrics based on logs
  - Cross-platform compatible
- Project Plan Document
  - 20% Completed
  - Skeleton File Created
  - Sections split up among team members
  - Rough draft of system architecture created
  - Initial mock user interface created

Team Rook

Status Report

[2 of 4]

Endpoint Data Monitoring and Analysis Agent

- Server Systems / Software
  - Amazon S3 (access pending)
  - RESTful Endpoint
  - Ubuntu 16.04 Back-End API Server
- Development Systems / Software
  - Go
  - Django + Python
  - React/Redux JS

Team Rook

Status Report

[3 of 4]

Endpoint Data Monitoring and Analysis Agent

- Client Contact
  - Weekly meeting set up for 2PM on Mondays
  - Constant Communication via Company HipChat Channel
- Team Meetings
  - Weekly Conference Call: Monday 2pm
  - Weekly Triage Meeting: Thursday 4:50pm
  - Weekly Group Meeting: Wednesday 6pm
- Team Organization
  - Client Contact: Drew Gilbertson
  - Team Structure: Web App group, Agent group, Database group

Team Rook

Status Report

[4 of 4]

Endpoint Data Monitoring and Analysis Agent

Risks

- Develop agent software that is cross-compatible
  - Creating background process that captures event logs for all OS
  - Understanding different OS event logs and how to capture them
- Developing health metrics to analyze captured logs
  - Determining the thresholds for analyzing event logs in real time
  - Research event log details and priorities, and conform to Rook standards
- Integration with existing Force Platform
  - Create a web app which extends the existing platform. We need to maintain the Force Platform's integrity.
  - Develop using iterative process while working closely with Rook's developers
- How to handle testing
  - How to gain realistic data. How to evaluate security thresholds.
  - Work with experts at Rook to fully understand realistic information flow

Team SpartanNash

Status Report

[1 of 4]

SpartanTrack

- Project Overview
  - Track Volunteer hours
  - Gamify the app, using badges/leaderboards
  - Messaging from captain to the platoon
  - Integrate Social media features
- Project Plan Document
  - Began initial draft of the plan – 10%
  - Began drafting our UML – 25%
  - Began sketching out GUI – 50%

Team SpartanNash

Status Report

[2 of 4]

SpartanTrack

- Server Systems / Software
  - MySQL is used to transfer app data from clients to server
  - Using SpartanNash proprietary API's for security

- Development Systems / Software
  - React Native for dual development (Android + IOS)
  - HTML/CSS/JAVASCRIPT/PHP (Web)

Team SpartanNash

Status Report

[3 of 4]

SpartanTrack

- Client Contact
  - Traveled to SpartanNash HQ and met with IT leaders
  - Weekly meetings - Tuesday and Friday @ 10:00 a.m.
- Team Meetings
  - Team meetings – Tuesday @ 11:30 a.m., Friday @ 1:00 p.m.
  - Triage meetings Friday @ 11:40 a.m.
- Team Organization
  - Pair Programming
  - Application Interface – Aleks + Denis
  - Web Development – Tianyi + Abbott
  - Data Transfer – Antonino + Abbott

Team SpartanNash

Status Report [4 of 4]

SpartanTrack

Risks

- Scalable connection with SpartanNash DB
  - May not perform well in real time
  - Lots of testing, good planning
- Gold-platting
  - Adding too many features may make the app difficult to use
  - Constantly check with the client to make sure the features implemented are needed
- Client satisfaction with User Interface
  - Interface may not be acceptable to user base
  - Redesign the interface for simplicity

Team Spectrum Health

Status Report

[1 of 4]

Spectrum GO

- Project Overview
  - Applications for hospital visitors to navigate
  - Web interface for staff to configure paths
  - Real-Time use of waypoints
- Project Plan Document
  - Outlined
  - Rudimentary Functional and Design Specifications Complete
  - 15% complete

Team Spectrum Health

Status Report

[2 of 4]

Spectrum GO

- Server Systems / Software
  - Microsoft SQL Server – TBD Friday
  - Identity Server – TBD Friday
  - GitHub/Repository – TBD Friday
- Development Systems / Software
  - Xcode – Up and Running
  - Android Studio – Up and Running
  - PHP Storm – Awaiting Client Approval

Team Spectrum Health

Status Report

[3 of 4]

Spectrum GO

- Client Contact
  - Spoken with client once, weekly conference call time to come
  - Site meeting scheduled for Friday, 01/19
- Team Meetings
  - Team has met 4 times
  - Weekly meetings scheduled two/three times a week, as needed
- Team Organization
  - Mobile & Web Development
  - Database Management
  - Customer Liaison

Team Spectrum Health

Status Report

[4 of 4]

Spectrum GO

Risks

- Spectrum Health Repository
  - Obtaining sample code and repository from Spectrum on Friday
  - Familiarize with the code as quickly as possible
- Route Data
  - Can route data be compact enough for a reasonable phone download?
  - If not, create options for downloading specific site data
- Real-time OCR
  - Using Google Optical Character Recognition
  - Follow tutorials and read documentation on the API
- Managing Waypoint and Routes
  - How to add/delete waypoints and update routes
  - Get everyone familiar with databases (SQL server)

Team Symantec

Status Report

[1 of 4]

Detecting Security Threats from User Authentication Patterns

- Project Overview
  - Build an application for analyzing VIP login data
  - Use the data to detect security threats in near real-time
  - Make dashboards to visualize the login data
- Project Plan Document
  - We started working on the outline
  - Table of contents is laid out
  - Started dividing up the work and discussing it at a meeting
  - 10% is complete

Team Symantec

Status Report

[2 of 4]

Detecting Security Threats from User Authentication Patterns

- Server Systems / Software
  - Amazon Web Services: Need to get it up and running
  - VIP Reporting Service Client: Waiting to get it from the client
- Development Systems / Software
  - Splunk: Installed on iMacs and became familiar with it
  - Elastic Search, Logstash, Kibana (ELK): Learning stack, doing basic tutorials

Team Symantec

Status Report

[3 of 4]

Detecting Security Threats from User Authentication Patterns

- Client Contact
  - Had a conference call with client and met with local contact
  - Weekly conference call scheduled Wednesday at 5:00 PM
- Team Meetings
  - Our team has met 5 times
  - Weekly team meetings Tuesday/Thursday at 4:20
- Team Organization
  - Assign 2 people for Splunk and 3 people for ELK/AWS
  - Re-distribute responsibilities halfway for pattern recognition and data analytics

Team Symantec

Status Report

[4 of 4]

Detecting Security Threats from User Authentication Patterns

Risks

- Ability to Detect suspicious patterns
  - There is a wide range of threats to detect and want to avoid false flags
  - Consult with experienced security advisor and identify possible threats
- Test Data
  - Real VIP data is necessary to identify accurate threat patterns
  - Get MSU's VIP data
- Consistency between Splunk and ELK
  - Making sure that functionality is consistent between both platforms
  - Develop both applications concurrently
- AWS Servers
  - The possibility of deploying the ELK applications on the AWS server
  - Use AWS documentation and use online resources

Team TechSmith

Status Report

[1 of 4]

Snagit and Camtasia Output Extensibility

- Project Overview
  - Simplify Sharing of Media Produced by TechSmith Products
  - Extend Output Capabilities of Snagit and Camtasia
    - TechSmith Video Review
    - Wistia
    - Student Choice: Imgur
- Project Plan Document
  - Outline complete
  - Overall document is ~10% written

Team TechSmith

Status Report

[2 of 4]

Snagit and Camtasia Output Extensibility

- Development Systems / Software
  - Windows 10 virtual machine set up in Capstone lab
    - Installed and tested Visual Studio 2017 with C# .NET
  - Access to relevant TechSmith GitHub repositories established, along with communication through Flowdock and Slack
  - Currently examining documentation of various APIs needed to accomplish our output extensibility features

Team TechSmith

Status Report

[3 of 4]

Snagit and Camtasia Output Extensibility

- Client Contact
  - Met with client in-person Friday 1/12 (Free Lunch!)
  - Weekly Google Hangouts call on Fridays at 1 PM
- Team Meetings
  - Team has met 3 times excluding All-Hands Meetings
  - Weekly meetings on Mondays at noon
- Team Organization
  - Quality Assurance: Logan Arent
  - Client Liaison: Carter Chamberlain
  - Technical Lead: Collin Dillinger
  - Project Manager: Ryan Schiller

Team TechSmith

Status Report

[4 of 4]

Snagit and Camtasia Output Extensibility

Risks

- Risk 1: Reduced Team Size
  - Description: Our team started with one fewer member than was originally intended
  - Mitigation: More rigid team organization and adherence to deadlines
- Risk 2: API Credential Management
  - Description: Our team requires APIs from three different applications
  - Mitigation: Coordination with TechSmith and establishing a timeline to have all credentials in place
- Risk 3: API Uniformity
  - Description: APIs used in this project may not present information uniformly
  - Mitigation: Use abstraction provided by the TechSmith Extensibility Framework
- Risk 4: UI Design
  - Description: GUI design is not a major skillset of our team
  - Mitigation: Using WPF will reduce the difficulty of making a unified design for our plugin interfaces

Team Union Pacific

Status Report

[1 of 4]

“ALEXA – what’s my work schedule look like?”

- Project Overview
  - Trainmen, Yardmen and Enginemen (TY&E) employees operate trains for Union Pacific.
  - TY&E employees are on-call 24/7 and have constantly changing schedules.
  - Schedules are currently viewable online or in mobile app.
  - Integrate employees schedules’ into voice assistants such as Amazon Alexa, Google Home, or Siri.
- Project Plan Document
  - Skeleton created and uploaded to Google Team Drive.
  - Early database schema plans created.
  - Different use cases discussed but not added yet.
  - Next team meeting plan to divide sections to each member.

Team Union Pacific

Status Report

[2 of 4]

"ALEXA – what's my work schedule look like?"

- Server Systems / Software
  - Server assigned and early set up began, not finished.
  - MySQL downloaded but not installed.
  - Early database schema created.
- Development Systems / Software
  - X-Code downloaded on Mac to begin iOS development.
  - Alexa Skills Kit development online.
  - Windows10 VM installed if needed.

Team Union Pacific

Status Report

[3 of 4]

"ALEXA – what's my work schedule look like?"

- Team Meetings
  - January 10th 6PM-7PM
    - First meeting with teammates
    - Introduce each other and share each people's schedule
    - Talked about project briefly
  - January 11th 2PM-3PM
    - Overview about Client meeting
    - Talked about how we can approach the project
  - January 16th 1:30PM-2PM & 4PM-5PM
    - Ready for client meeting
    - Shared technical idea for project
    - Re-summarized client meeting
    - Planed for each week detail schedule
- Team Organization
  - Client contact: Jared McMillan
  - Scheduling: M Kim
  - IOS & Siri & Alexa: M Kim, Daniel Agbay, Austin McGee
  - Database & Server: Jared McMillan, Daniel Agbay, David Hubble
- Client Contact
  - January 11th 1PM-2PM
    - First Client meeting with conference call
    - Overview for project tasks
    - Talked about Client request detail
  - January 16th 2PM-3PM
    - Second meeting with Client
    - Talked about the plan for project
    - Talked about risk and difficulties
    - Shared UX mock up design
    - Talked brief schedule for each week

Team Union Pacific

Status Report

[4 of 4]

“ALEXA – what’s my work schedule look like?”

Risks

- Risk 1 : Verification
  - We will be handling sensitive information to the company and want to make sure this data is secured and not a security threat.
  - We are exploring authentication channels through Google and Apple to minimize this risk.
- Risk 2 : Scalability
  - Worried that a database focused information flow for the app will be difficult to scale to many users.
  - Attempting to minimize database communication by storing preferences locally on app and requiring verification only once.
- Risk 3 : Schedule Format
  - Union Pacific has many child companies that will use this app and each may have a different schedule format.
  - Working with client to develop a standardized schedule format such as CSV or XML.
- Risk 4 : Assistant Development
  - Unsure how to develop verification and settings options on voice assistants that do not have a mobile app such as Alexa and Google Home.
  - Looking through Alexa documentation and working to set up very basic Alexa function – a Hello World program. Also exploring other Alexa apps to see how their verification systems work.

Team Urban Science

Status Report

[1 of 4]

Mobile Maestro

- Project Overview
  - Control Maestro Exoskeletal Arm
  - Use Mobile App with Voice Input
  - Auto-Leveler
  - Additional Safety Features
- Project Plan Document
  - Outline created
  - Question list for client in progress
  - 20% complete

Team Urban Science

Status Report

[2 of 4]

Mobile Maestro

- Server Systems / Software
  - Azure server
  - .NET API Endpoint
  - SQL Server
- Development Systems / Software
  - Cordova / Ionic setup
  - SDK’s installed
  - GIT Setup
  - VM Setup

Team Urban Science

Status Report

[3 of 4]

Mobile Maestro

- Client Contact
  - In-Person meeting
  - Weekly meetings scheduled
- Team Meetings
  - Multiple held so far
  - Bi-Weekly meetings scheduled
- Team Organization
  - Rotating project manager
  - Roles assigned

Team Urban Science

Status Report [4 of 4]

Mobile Maestro

Risks

- Bluetooth
  - Setting up BLE connection to Arms
  - Cordova BLE plugins
- Auto-Balancing
  - Automatically balancing the Arms when on an incline
  - Using phones Accelerometer / Gyroscope to level the system
- Voice activation
  - Using vocal commands to control arms at all times
  - Using Siri and Google Assistant
- User Experience
  - UI needs to be simple and accessible
  - Follow accessibility guidelines

Team USAA

Status Report

[1 of 4]

LIMElight: Life Insurance Made Easy

- Project Overview
  - Generate accurate life insurance quote using machine learning
  - Improve experience of receiving a insurance quote by creating a responsive mobile-friendly web application
  - Utilize Ethereum blockchain to maintain and secure health records
- Project Plan Document
  - System architecture diagram mockup is complete
  - Screen mockups drafted

Team USAA

Status Report

[2 of 4]

LIMElight: Life Insurance Made Easy

- Server Systems / Software
  - Deployed an Ethereum blockchain consortium on a Microsoft Azure server
  - Deployed additional Azure server to host web application
  - Hosting “Hello, world” applications for testing
- Development Systems / Software
  - Installed Homebrew for package management
  - Set up Windows virtual machines
  - Configured Gitlab, Dropbox, Trello, and Slack services
  - Installed Anaconda Python distribution

Team USAA

Status Report

[3 of 4]

LIMElight: Life Insurance Made Easy

- Client Contact
  - Conference call project kickoff (introductions, project overview, expectations)
  - Scheduled recurring weekly conference call Fridays at 4:00PM EST
- Team Meetings
  - The team has met four times thus far
  - USAA employees will be visiting from San Antonio at least once during the semester
- Team Organization
  - Mike: Machine learning
  - Xingchi, Dong, Nate: Web application (front and back-end)
  - Abe: Project manager, utility player

Team USAA

Status Report

[4 of 4]

LIMElight: Life Insurance Made Easy

Risks

- Blockchain Implementation
  - Inexperience with the technology, difficult to see its use case
  - Enrolled in Ethereum Udemy course, discussing relevance with client
- Accurate Life Insurance Quotes
  - Model may struggle to produce an accurate life insurance quote with minimal applicant input
  - Review academic research about most significant factors affecting an applicant's riskiness
- Poor Dataset
  - Possibility of too few samples, inaccurate metrics, and irrelevant features
  - Utilize third party datasets and generate our own data (e.g. location-based)
- Lack of Subject Matter Expertise
  - Group does not have any experience with life insurance industry
  - Connect with underwriters and actuaries at USAA

Team Yello

Status Report

[1 of 4]

Sentiment and Emotional Analysis of Video Interviews

- Project Overview
  - Build web app to facilitate recording and playback of pre-recorded and live video interviews
  - Sentiment Analysis and Emotion Detection on audio/ video
  - Storing and querying of video interviews and sentiment/ emotion results
- Project Plan Document
  - Drafted cover page and table of contents
  - Functional specs and mockup in progress
  - Approximately 10% complete

Team Yello

Status Report

[2 of 4]

Sentiment and Emotional Analysis of Video Interviews

- Server Systems / Software
  - Heroku Server
  - Ruby on Rails
  - PostgreSQL
- Development Systems / Software
  - Scikit for sentiment analysis
  - Azure Emotion API for emotion detection
  - GitLab set-up

Team Yello

Status Report

[3 of 4]

Sentiment and Emotional Analysis of Video Interviews

- Client Contact
  - Slack chat, e-mail, Google Hangouts
  - Weekly conference calls on Fridays, 11:00 a.m.
- Team Meetings
  - 4 meetings thus far
  - Weekly meetings on Tuesdays, 2:00 p.m.
- Team Organization
  - Trello for task organization
  - Slack for quick communication
  - GitLab for code collaboration

Team Yello

Status Report

[4 of 4]

Sentiment and Emotional Analysis of Video Interviews

Risks

- Risk 1
  - Functionality and integration of APIs with Ruby on Rails
  - Use our own input videos on the APIs
- Risk 2
  - Managing Candidate vs. Staff privileges and views
  - Design user model to identify user status
- Risk 3
  - Capturing live video
  - Inquire into TechSmith's similar 2016 capstone project and contact team members for advice
- Risk 4
  - Transcribing audio for sentiment analysis
  - Research speech recognition methods/ APIs and use our sample input