The Capstone Experience

Dr. Wayne Dyksen
Department of Computer Science and Engineering
Michigan State University
Spring 2018
Course Goals

• Build a Significant Software System
• Work in a Team Environment
• Learn New Tools and Environments
• Build and Administer Systems
• Develop Communication Skills
• Develop Interview Talking Points
• Consider Issues of Ethics and Professionalism
Course Goals

• Teams of Students
• Build Significant Software System
  ▪ Design
  ▪ Develop
  ▪ Debug
  ▪ Document
  ▪ Deliver
• For Corporate Clients
• In 15 (Short) Weeks
Project Deliverables

• Project Plan Document & Presentation
• Alpha Presentation
• Beta Presentation
• Project Software & Documentation
• Project Video
• Design Day

See Major Milestones.
All-Hands Meetings

• TTh, 3:00-4:20 p.m., 1279 Anthony Hall
• Presentations By
  ▪ Professor
  ▪ Teams
    o Status Report Presentations
    o Formal Presentations
      ➢ Project Plan
      ➢ Alpha
      ➢ Beta
    o Project Videos
  ▪ Guest Speakers
All-Hands Meetings

- 01/09: Capstone Overview
- 01/11: Project Plan
- 01/16: Risks and Prototypes
- 01/18: Schedule and Teamwork
- 01/23: Team Status Report Presentations
- 01/25: Team Status Report Presentations
- 01/30: Team Project Plan Presentations
- 02/01: Team Project Plan Presentations
- 02/06: Team Project Plan Presentations
- 02/08: Team Project Plan Presentations
- 02/13: Resume Writing and Interviewing
- 02/15: Creating and Giving Presentations
- 02/20: Team Alpha Presentations
- 02/22: Team Alpha Presentations
- 02/27: Team Alpha Presentations
- 03/01: Team Alpha Presentations
- 03/06: (Spring Break, No Meeting)
- 03/08: (Spring Break, No Meeting)
- 03/13: Team Status Report Presentations
- 03/15: Team Status Report Presentations
- 03/20: Design Day and the Project Videos
- 03/22: Camtasia Demo
- 03/27: Intellectual Property
- 03/29: Ethics and Professionalism
- 04/03: Team Beta Presentations
- 04/05: Team Beta Presentations
- 04/10: Team Beta Presentations
- 04/12: Team Beta Presentations
- 04/17: Status Report Presentations
- 04/19: Status Report Presentations
- 04/24: Project Videos
- 04/26: Project Videos and All Deliverables
- 04/26: Design Day Setup
- 04/27: Design Day
- 05/03: Project Videos
The Capstone Experience

Team Accenture

Department of Computer Science and Engineering
Michigan State University
Spring 2018
accenture
NEW ISN’T ON ITS WAY.
WE’RE APPLYING IT RIGHT NOW.

Accenture is answering real business challenges for our clients through innovation and deep industry knowledge. Here’s how.
Team Accenture
Project Overview

AMAP: Automated Malware Analysis Platform

• Functionalities
  ▪ Automate Analysis of Malware
  ▪ Provide All-Inclusive Platform

• Features
  ▪ Ingest Malware Samples
  ▪ Decode Configuration Settings
  ▪ Recover Malware Artifacts
  ▪ Create Relationships in iDefense Platforms
  ▪ Save Payloads in Malware Repository

• Technologies
  ▪ Accenture iDefense Malware Repository
  ▪ Accenture iDefense IntelGraph
  ▪ Database Technologies
    ○ MongoDB
    ○ mySQL
  ▪ Python
Team Accenture
Griffin Metevia, Sam Kling, Julian Ellis, Andrew Mitchell, Teng Xu
Team Accenture
Project Plan Presentation
Screen Mockup: Malware Search
Team Accenture
Project Plan Presentation

Architecture Diagram

AMAP Modules

Python

Data Server

iDefense
Part of Accenture Security

Malware Database

mongoDB, Django

AMAP Dashboard

HTML, CSS, JavaScript

AWS Web Services
Team Accenture Project Plan Presentation
Team Accenture
Project Plan Presentation

Screen Mockup: AMAP Dashboard

Container Status

Malware Processed Per Hour

- Starting Up: 4%
- Running: 18%
- Idle: 2%
Team Accenture
Alpha Presentation
Current Process Status Page
Team Accenture
Alpha Presentation

Module Selection Page

Dashboard
File Upload
Processes

Modules

- File Type
- MD5
- SHA1
- SHA256
- Entropy
- Decoder
- NETDATA

Submit

13413701_10209874704294851_7569077515899457902_n.jpg

19989639_10213542700812284_7767808038276667761_n.jpg
Team Accenture
Alpha Presentation

Dashboard

Today's Processed Files
New Malicious Files: 1125
New Non-Malicious Files: 500

Average Processing Time
Time: 3.5 minutes

File Types
- Windows Executable
- Microsoft Office Documents
- Other

Malware Processed Per Hour

New Malware Samples Per Hour
The Capstone Experience

Team Amazon

Department of Computer Science and Engineering
Michigan State University
Spring 2018
AMPED: Amazon Marketplace Podcast Earnings Detection

- **Functionalities**
  - Play Podcasts
  - Show Listeners Related Amazon Products
  - Support Listener’s Favorite Content Producer

- **Features**
  - Create Integrated Audio Player
  - Enable Uploading of Podcast by Producer
  - Transcribe Speech to Text
  - Comprehend Content
  - Find Related Amazon Products
  - Package Results Into API for Player

- **Technologies**
  - AWS Compute & Database Services
  - Amazon Transcribe
  - Amazon Comprehend
  - Amazon Item Search
  - Amazon Queuing and Notification Services
  - Amazon Elastic Beanstalk and API Gateway

Team Amazon
Project Overview

Seattle, Washington
Detroit, Michigan
Team Amazon
Zach Whitener, Hansheng Zhao, Dillon Stock, Cam Korzecke, Chess Luo
Team Amazon
Project Plan Presentation

Screen Mockup: Web App Dashboard
Podcast Upload Modal

CREATE A NEW PODCAST

Team Amazon Project Plan Presentation
Team Amazon
Project Plan Presentation

Architecture Diagram

Web Application

Amazon RDS

Store data
Retrieve data

Python Django API
Running on an EC2 Instance

Update job progress
Add job to respective queue

Lambda Microservices

Transcribe
Comprehend
Product Search

Begin Transcribe
Begin Comprehend
Begin Product Search

Amazon S3

Retrieve file contents
Store file
System Architecture

Team Amazon
Project Plan Presentation
Team Amazon

Project Plan Presentation

Screen Mockup: Podcast Details Page
Team Amazon
Alpha Presentation

AMPED Dashboard

Plant Money
The economy, sustained, with stories and surprises. Imagine you could call up a friend and say, “Meet me at the bar and tell me what’s going on with the economy.” Now imagine that’s actually a fun evening. That’s what we’re going for at Planet Money. People seem to like it.

Title | Length | Status | Updated Time | Actions
--- | --- | --- | --- | ---
What America Sells To The World | 2:45 mins | Completed | 2018-02-20 01:15:25 |  
Episode B21: The Other Davos | 63:39 mins | Completed | 2018-02-20 01:15:25 |  
Janet Yellen's Mystery Story | 16:36 mins | Transcribing | 2018-02-20 01:15:25 |  
Weed GDP | 82:48 mins | Failed | 2018-02-20 01:15:25 |  
The Black Car Fund | 17:00 mins | Failed | 2018-02-20 01:15:25 |  
Episode B20: P is For Phosphorus | 70:48 mins | Transcribing | 2018-02-20 01:15:25 |  
Amazon, IPOs And The Queen Of The Demonweb Pits | 96:51 mins | Comprehending | 2018-02-20 01:15:25 |  
A Mafia Story With a Twist | 88:00 mins | Completed | 2018-02-20 01:15:25 |  
Episode B19: Tax Me If You Can | 22:14 mins | Failed | 2018-02-20 01:15:25 |  

Podcasts: 59
Listeners: 12,444
Rank: 2/200

Playing
What America Sells To The World

U.S. exports include airplanes, education and lots of blood.
The Capstone Experience

Team Amazon

Alpha Presentation

Product Detail Page

Google Earbuds

Progress

Top Clicks

<table>
<thead>
<tr>
<th>Rank</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Listen Bluetooth Headphone...</td>
</tr>
<tr>
<td>2</td>
<td>Apple 12.9&quot; iPad Air 2</td>
</tr>
<tr>
<td>3</td>
<td>Google Pixel XL Unlocked L</td>
</tr>
<tr>
<td>4</td>
<td>Apple MD827LL/B Earbuds Air...</td>
</tr>
<tr>
<td>5</td>
<td>Google Wifi system (set of ...)</td>
</tr>
</tbody>
</table>

Product Detail

Listen Bluetooth Headphones, Wireless Earbuds

$24.99

NOTE: When in paired, please pair the 2 earbuds first then by your Bluetooth devices.

Here are steps to connect:

Transmission
1. Long press the power button of the earphones at the same time until the led flash in blue and red alternately. The both of them have a voice say "power on" and then "pairing".
2. Double press once one of them will have a vioce "search for led" and wait for, and led of earbuds flash in blue and red alternately will have a vioce "pairing success", that is the pairing status.
3. Please turn on the "Bluetooth" on your cellphone and choose "MD827LL/B" on your list.
4. The led flash will be steady in blue when connected.

Single Pairing
1. Long press the power button of the earphones until the led flash in blue and red alternately, then it is ready to pair.
2. Please turn on the "Bluetooth" on your cellphone and choose "MD827LL/B" on your list, there would be 2 earbuds from the earphones.

What's in the box:
- 1 pair earbuds
- 1 x ear tips
- 1 x USB Charging Cable For Case
- 1 x Charging Case
Team Amazon
Alpha Presentation
Team Amazon
Alpha Presentation
Podcast Library and Product Detail Page
The Capstone Experience

Team Aptiv

Department of Computer Science and Engineering
Michigan State University
Spring 2018
Team Aptiv
Project Overview

CMS: Cybersecurity Management System

- Functionalities
  - Automate Aptiv’s Cybersecurity Process
  - Visualize and Analyze Data Trends
- Features
  - Modules for all Cybersecurity Processes
    - Threat Analysis and Risk Assessment
    - Vulnerability/Penetration Assessment
    - Mitigation Remediation
    - Incident Response
  - Database Visualizations and Analysis
    - Threats/Risks
    - Vulnerabilities
    - Incidents
    - Mitigations
  - Provide Communication Through Task Manager and Request System
- Technologies
  - ASP.NET (C#)
  - CSS/HTML
  - MS SQL
  - Synopsys Protecode
  - Microsoft Azure
Team Aptiv
Dillon Brown, Clayton Peters, Ashtaan Rapanos, Winton Qian, Wei Jiang
Team Aptiv
Project Plan Presentation
Team Aptiv
Project Plan Presentation

Architecture Diagram
Team Aptiv
Project Plan Presentation
Team Aptiv
Project Plan Presentation

Screen Mockup: Vulnerability Assessment
Team Aptiv
Alpha Presentation

Dashboard
Team Aptiv
Alpha Presentation

Product Dashboard
The Capstone Experience

Team Auto-Owners

Department of Computer Science and Engineering
Michigan State University
Spring 2018
Auto-Owners
Insurance
Life • Home • Car • Business
For What Matters Most

Insurance built around your needs by a local independent agent

FIND AN AGENT FOR A QUOTE

Why choose an independent agent?

Pay Your Bill

Report a Claim

Policies to Meet Your Needs
The Capstone Experience

Team Auto-Owners
Project Overview

IMAGINE: IMAGe INtake Experience

• Functionalities
  ▪ Evaluate Physical Environments (for Insurance Purposes)
  ▪ Leverage Virtual Reality
  ▪ Create Virtual Environments Using Spherical Camera

• Features
  ▪ Support Image Import From Spherical Camera
  ▪ Classify the Environment
  ▪ Detect and Identify Objects
  ▪ Create Virtual Environment
  ▪ Provide Playback, Navigation and Inspection
  ▪ Build and Display Inventory View

• Technologies
  ▪ Unity Game Engine
  ▪ Oculus Rift and Touch Controllers
  ▪ Oculus Rift Sensor
  ▪ Ricoh Theta V Spherical Camera
  ▪ Image Processing and Recognition

Auto-Owners
INSURANCE
LIFE • HOME • CAR • BUSINESS
Lansing, Michigan
Team Auto-Owners
Zack Geizer, Reece Cole, Sean Larabell, Nick Frederick, Xinyun Zhao
Team Auto-Owners
Project Plan Presentation

Screen Mockup: Web Application
Team Auto-Owners Project Plan Presentation
Team Auto-Owners
Project Plan Presentation

Architecture Diagram

Server-Side Applications
- Object Recognition System
  - submits environment images for object identification
  - creates object listings in object database

User System
- manages user data, updates data, retrieves data, creates data

Database
- MariaDB

Client-Side Applications
- VR Application
  - Displays panoramic view of uploaded environment and object info
  - Provides user's visual orientation and microphone input

Web Application
- Allows user to interact with UI and select available objects
- User uploads omnidirectional images to web portal

External Hardware
- Oculus Rift Headset
- Oculus Rift Controllers
- Omnidirectional Camera

Project Plan Presentation
Architecture Diagram
Team Auto-Owners
Project Plan Presentation
Team Auto-Owners
Project Plan Presentation

Screen Mockup: VR User Interface
### Team Auto-Owners

**Alpha Presentation**

Web: Inventory List

---

#### Inventory View

<table>
<thead>
<tr>
<th>Image</th>
<th>Object</th>
<th>Room</th>
<th>Characteristics</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>sink</td>
<td>bathroom #1</td>
<td>Pedestal</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Shower/Tub</td>
<td>Bathroom #2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Mirror</td>
<td>Bathroom #2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Bed</td>
<td>Bedroom #1</td>
<td>Queen</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Drawer</td>
<td>Bedroom #1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Team Auto-Owners
Alpha Presentation

Object Detection
Team Auto-Owners Alpha Presentation
Team Auto-Owners
Alpha Presentation

VR: Selecting Object Nodes
The Capstone Experience

Team Dow

Department of Computer Science and Engineering
Michigan State University
Spring 2018
Solutions for Human Progress

News & Features
- Dow to Expand Propionic Acid Facility in Texas
- Dow COO Jim Fitterling Presented the “Doing a World of Good” Medal for Advancing the Societal Contributions of

Stay Up-To-Date
- Sign Up For Dow Announcements
- Subscribe To DowDuPont Alerts
- www.dow.dupont.com
Team Dow
Project Overview

Virtual Reality Simulation for Railcar Loading

- Functionalities
  - Teach How to Load a Railcar Safely
  - Via First Person Virtual Reality Game

- Features
  - Support Two Levels of Difficulty
    - Non-Certified
    - Certified
  - Handle Various Scenarios
    - Normal Filling
    - Response to Spills
  - Manage Player Points
    - Award for Positive Actions
    - Deduct for Negative Actions
  - Enable Interaction with Game Objects
    - Personal Protective Equipment (PPE)
    - D-Rails
    - Slide Valves
  - Use Audio to Indicate When Action Needed
  - Simulate Different Weather Conditions
  - Provide Feedback to Player at Game End

- Technologies
  - Unity Game Engine
  - Vive and Touch Controllers
  - Vive SDK
  - Microsoft .NET / C#
  - Xamarin
Team Dow
Kyle White, Matthew Smith, John Yoo, JD Hayward, David Wang
Team Dow
Project Plan Presentation

Screen Mockup: The Loading Area
Team Dow
Project Plan Presentation
Team Dow
Project Plan Presentation

Software
- Audacity
- C#
- 3DS MAX
- Photoshop

Hardware
- VRTK
- SteamVR
- Steam

Language
- SDK

Assets
- 3D assets

Architecture Diagram
Team Dow
Project Plan Presentation
Team Dow
Project Plan Presentation

Screen Mockup: The Railcar
See VB Module UTL_PresentationSlidesSend2FB.
Team Dow
Alpha Presentation

Load Arm and Spreader
Team Dow

Alpha Presentation

Derailer
The Capstone Experience

Team DRIVEN-4

Department of Computer Science and Engineering
Michigan State University
Spring 2018
Driven To Enable Your Success!

We are technology leaders who were in your shoes yesterday. We can help you achieve your PLM, IoT & CyberSecurity journey like no-one else.
Team DRIVEN-4
Project Overview

2020 Business in a Box

• Functionalities
  ▪ Develop Futuristic Business Environment
  ▪ Base on Internet of Things (IoT) Architecture
  ▪ Target 2020 and Beyond

• Features
  ▪ Model Five to Ten Components
  ▪ Connect Components via WiFi
  ▪ Validate and Verify Design via Simulation
  ▪ Develop Manufacturing Processes and Artifacts
  ▪ Demonstrate Capabilities for Collaboration and Integration
  ▪ Utilize Various Product Development Software Systems

• Technologies
  ▪ Computer Aided Design (CAD) / Siemens NX and PTC CREO
  ▪ Product Lifecycle Management (PLM) / Siemens Teamcenter and PTC Windchill
  ▪ Design Simulation Tools / PTC and Siemens
  ▪ Factory Floor Simulation / Siemens
  ▪ IoT Platforms / PTC ThingWorx and Siemens MindSphere
  ▪ 3D Printing
  ▪ Conveyor and Sight System
  ▪ Augmented and Virtual Reality (VR/VR) / PTC Thingworx Studio
Team DRIVEN-4
Brian Pinsky, Nick Mikelsavage, Charles Carroll, Betty Wu, Sam Coffey
Team DRIVEN-4
Project Plan Presentation
Team DRIVEN-4
Project Plan Presentation

Architecture Diagram
Team DRIVEN-4
Alpha Presentation

Manufacturer’s Web Portal Dashboard
Team DRIVEN-4 Alpha Presentation
Team DRIVEN-4
Alpha Presentation
3D Model for Augmented Reality
The Capstone Experience

Team GM

Department of Computer Science and Engineering
Michigan State University
Spring 2018
Team GM
Project Overview

Plato: DevBot for Microsoft Teams

• Functionalities
  ▪ Create and Manage Virtual Machines
  ▪ Manage and Run Test Cases
  ▪ Target GM Developers

• Features
  ▪ Provide Single Unified Environment
  ▪ Integrate with Microsoft Teams
  ▪ Design Simplified User Controls
  ▪ Use Natural Language Processing

• Technologies
  ▪ CSS / HTML5 / JavaScript
  ▪ Microsoft
    o .NET / C#
    o Bot Framework
    o Language Understanding Intelligent Services (LUIS)
    o Team Foundation Server
    o Teams / O365
    o Azure
  ▪ Natural Language Processing (NLP)
  ▪ RESTful Web Services and JSON
Team GM
Alex Lepird, Tao Tao, Simeon Goolsby, Matthew Eaton, Colin Coppersmith
Team GM
Project Plan Presentation

Screen Mockup: VM Creation
Team GM
Project Plan Presentation
Team GM
Project Plan Presentation

Architecture Diagram
Team GM
Project Plan Presentation
Team GM
Project Plan Presentation

Screen Mockup: Web Dashboard

- Microsoft Azure
- Microsoft Azure
- Visual Studio
- Azure Bot Service
- .NET Framework
- Microsoft Teams

The Capstone Experience
Team GM
Alpha Presentation

VM Creation Through Bot
Team GM
Alpha Presentation

Information on Clicked Test
The Capstone Experience

Team Herman Miller

Department of Computer Science and Engineering
Michigan State University
Spring 2018
Prospect
Your headquarters for co-creation
Start Thinking Visually
Team Herman Miller
Project Overview

Adjust: Augmented Reality Chair Adjustment

• Functionalities
  ▪ Simplify Adjusting High Performance Office Chair
    ○ Ergonomic
    ○ “Developer Chair”
  ▪ Use Chatbot to Explain How

• Features
  ▪ Automatically Identify Chair via Photo
  ▪ Provide Step-by-Step Instructions
  ▪ Customize to User’s Ergonomic Needs
  ▪ Support Apple iOS and Google Android Devices
  ▪ Leverage Facebook Messenger

• Technologies
  ▪ Apple iOS / Swift
  ▪ Google Android / Java
  ▪ Image Processing and Recognition
  ▪ Natural Language Processing (NLP)
  ▪ Facebook Messenger
Team Herman Miller
Kevin Gaban, Mike Bremiller, Kyle Kinsey, Jacob Weber, Han Huang
Team Herman Miller
Project Plan Presentation

Screen Mockup: Identifying Chair

Tap the “Adjust” button and sit in your chair to begin guided adjustment.

Aeron (remastered)
Team Herman Miller
Project Plan Presentation

Architecture Diagram

3D assets

Model Target Generator

Camera Input

Vuforia matches model target to camera input

Unity displays appropriate interactive 3D model

iOS

Builds

Xcode

Android

Builds
Team Herman Miller
Project Plan Presentation
Team Herman Miller
Project Plan Presentation

Step 1: Height Adjustment
Locate and tap the highlighted height adjustment level on your Aeron chair.
Front handles on the right and left sides of the seat.

In the proper position, you will have approximately three fingers of clearance between the back of your knees and the seat edge.

To increase or decrease depth: Lift your thigh weight from the front of the seat. Gently lift up the front handles on the right and left sides to disengage the locking seat depth adjustment. Slide seat forward or back into proper depth for use; then release downward to lock the seat.
See VB Module UTL_PresentationSlidesSend2FB.
The Capstone Experience

Team Herman Miller
Alpha Presentation

Main Menu

- Camera
  Use your phone's camera to detect your Herman Miller chair.

- Gallery
  Select from our gallery of Herman Miller office chairs.

- About Us
  Learn more about Herman Miller and our range of products.
The Capstone Experience

Team Meijer

Department of Computer Science and Engineering
Michigan State University
Spring 2018
Santa Bucks are back! last time this year!

save over $50
Team Meijer

Project Overview

Thifty: Personal Shopping Assistant

• Functionalities
  ▪ Streamline Shopping Experience
  ▪ Leverage Mobile App
  ▪ Interact by Voice or Chatting

• Features
  ▪ Create Mobile Apps
    o Apple iOS
    o Google Android
  ▪ Determine Product Information
    o Location in Store
    o Stock
    o Sale
    o Coupon
  ▪ Compare Prices to Other Stores
  ▪ Integrate with mPerks
  ▪ Send Notifications to In-Store Team Members

• Technologies
  ▪ Microsoft
    o .NET Framework (C# / ASP.NET)
    o Bot Framework
    o Language Understanding Intelligent Service (LUIS)
    o Azure
    o Application Insights
    o Visual Studio
  ▪ Xamarin
  ▪ Meijer Web Services
  ▪ SQL Server / MongoDB
Team Meijer
Emerson Chen, Zach Richardson, Megan Lippert, Jacob Bonesteel, Aaron Carlso
Team Meijer
Project Plan Presentation

Screen Mockup: Chat Interface

Hi, I'm Thrifty, your personal shopping assistant. Feel free to ask me anything, or you can tap this message for some more options.

Ask Thrifty
mPerks Help

These are some of the FAQ's. Tap one to begin your search.

*Is there a coupon for ___?*

*Is ___ in stock?*

*What are the competitor prices for ___?*

*Where can I find ___?*

Ask Thrifty
mPerks Help
Team Meijer
Project Plan Presentation
Team Meijer
Project Plan Presentation
Team Meijer
Project Plan Presentation

Screen Mockup: Functionality

Coca-Cola: 24 pk
$7.99 ea
Aisle 12

Out-Of-Stock
Click here to alert a Meijer Team Member

Coupon Available

Competitor Prices

Ask Thrifty

Here is what I found.

Coca-Cola: 24 pk
Meijer: $7.99
Walmart: $7.99
Kroger: $7.99
Target: $8.99

Ask Thrifty
Team Meijer
Alpha Presentation
Team Meijer
Alpha Presentation

Home Screen

The Capstone Experience
Team Meijer
Alpha Presentation

Hi, I'm Thrifty, your personal shopping assistant! Feel free to ask me anything, or you can tap this message for some more options.

The following are some of the FAQ:
Is there a coupon for ____?
Is ____ in stock?
What are the competitor prices for ____?
Where can I find ____?

These are some of the FAQ's. Tap one to begin your search.

"Is there a coupon for ____?"
"Is ____ in stock?"
"What are the competitor prices for ____?"
"Where can I find ____?"
Team Meijer
Alpha Presentation

Product Page and Conversations
The Capstone Experience

Team Michigan State University

Department of Computer Science and Engineering
Michigan State University
Spring 2018
Team Michigan State University
Project Overview

Pulse: Classroom Engagement System

• Functionalities
  ▪ Provide Real-Time Feedback and Communication During Class
  ▪ Keep Track of Student Attendance

• Features
  ▪ Provide Web App for Instructors
    o Create Questions, Surveys and Quizzes
    o Open Questions and Quizzes at Specific Times
    o View and Save Results in Real Time
      ➢ Class Results with Charts and Graphs
      ➢ Individual Results
    o Push Content to Student Devices
    o View Student Questions and Comments
    o Track and View Class Attendance
  ▪ Provide Mobile App for Students
    o Answer Survey and Quiz Questions During Class
    o View Instructor-Posted Content
    o Post Questions and Comments
  ▪ Take Attendance with Mobile Devices via iBeacons

• Technologies
  ▪ Apple iOS / Swift
  ▪ Google Android / Java or Kotlin
  ▪ Amazon Web Services (AWS)
  ▪ iBeacons
Team Michigan State University
Owen McMahon, Adam Blaida, Lauren Malik, Yaqeen Al-Marhoon, David York, Andrew Schafer
Team Michigan State University
Project Plan Presentation

Android and iOS Design
Team Michigan State University
Project Plan Presentation
Team Michigan State University
Project Plan Presentation

Architecture Diagram

Estimote Beacons

ID

Mobile Student Client

Sockets

Instructor Web Client

API Gateway

Elastic Beanstalk

EC2

SNS

RDS

Amazon Web Services

Node.js
Team Michigan State University
Project Plan Presentation
Team Michigan State University
Project Plan Presentation
Team Michigan State University
Alpha Presentation
Team Michigan State University
Alpha Presentation

Mobile Questions

Question 1
00:20

Which university resides on the banks of the Red Cedar River?

University of Michigan
Wayne State University
Michigan State University
Oakland University

Submit

The Time Complexity of this Algorithm is:

O(N)
CONSTANT
O(100N)
O(N^2)

Submit
Do not delete this textbox.

It's used as a marker in VB code.

See VB Module UTL_PresentationSlidesSend2FB.

Team Michigan State University
Alpha Presentation
The Time Complexity of this Algorithm is:

- O(n)
- Constant
- O(n^2)
- O(logN)
The Capstone Experience

Team Mozilla

Department of Computer Science and Engineering
Michigan State University
Spring 2018
The new Firefox

Fast for good.

With 2x the speed, built-in privacy protection and Mozilla behind it, the new Firefox is the better way to browse.

Download Firefox

Firefox Privacy Notice
Dark Theme Darkening

- Functionalities
  - Increase Customizability of Firefox
  - Leverage Firefox Quantum Theming API
- Features
  - Provide Ability to Customize New Areas
    - Menus
    - Sidebars
    - In-Product Pages
  - Apply CSS Custom Variables and JavaScript
  - Leverage Inter-Process Communication
    - Pass Messages
    - Between Privileged and Unprivileged Code
  - Support Apple macOS, Microsoft Windows and Linux
  - Ship with Future Release of Firefox
- Technologies
  - CSS
  - JavaScript
  - Python
  - XUL / XBL / HTML
  - Mercurial
  - IRCCloud
  - Bugzilla
  - Review Board
  - Microsoft Windows
  - Apple macOS
  - Linux
Team Mozilla
Vivek Dhingra, Connor Masini, Dyl Stokes, Bogdan Pozderca, Zhengyi Lian
Team Mozilla
Project Plan Presentation

Screen Mockup: In-Product Page
Team Mozilla Project Plan Presentation
Team Mozilla
Project Plan Presentation

Architecture Diagram

API

Firefox Theme

Chrome Theme

CSS
Team Mozilla
Project Plan Presentation
Project Plan Presentation

Screen Mockup: Menus
Team Mozilla
Alpha Presentation

Auto-Complete Styling
Team Mozilla
Alpha Presentation

Popup Styling
Do not delete this textbox. It's used as a marker in VB code. See VB Module UTL_PresentationSlidesSend2FB.

Team Mozilla Alpha Presentation
Team Mozilla
Alpha Presentation

Find Bar and Menu Styling
The Capstone Experience

Team MSUFCU

Department of Computer Science and Engineering
Michigan State University
Spring 2018
Michigan State University
Federal Credit Union
Building Dreams Together
Your morning coffee could win you $800.

Find Out More
Team MSUFCU
Project Overview

Digital Assistant and Personal Financial Coach

• Functionalties
  ▪ Offer Personalized Financial Coaching Services
  ▪ Use Digital Assistant

• Features
  ▪ Answer Questions and Provide Recommendations
    ○ Can I afford to buy that?
    ○ How much can I spend at the store today?
    ○ What do people like me spend on rent?
  ▪ Take Actions and Provide Services
  ▪ Handle Text and Voice Input
  ▪ Create Middleware API to MSUFCU
  ▪ Analyze Anonymized Account and Transaction Data
  ▪ Support Apple iOS and Google Android Devices
  ▪ Integrate with Various Services
    ○ Facebook Messenger
    ○ Apple iMessage
    ○ Amazon Alexa
  ▪ Provide Administrative Web Portal

• Technologies
  ▪ CSS / HTML / PHP / JavaScript
  ▪ Apple iOS / Swift
  ▪ Google Android / Java
  ▪ Facebook Messenger API
  ▪ Apple iMessage
  ▪ Amazon Echo / Alexa Skills Kit
  ▪ Machine Learning (ML)
  ▪ Natural Language Processing (NLP)
  ▪ MySQL / Encryption Based on SQL Standards
Team MSUFCU
Patrick Dame, Dallas Nowak, Michael Carter, Rachel Beard, Dane Holmberg
Team MSUFCU
Project Plan Presentation

Screen Mockups: Android App
Team MSUFCU
Project Plan Presentation
Team MSUFCU
Project Plan Presentation

Architecture Diagram

Admin Portal

Middleware

MSUFCU SQLite Database

iOS App, Android App, Amazon Alexa, Facebook Messenger, and iMessage

The Capstone Experience
Team MSUFCU
Project Plan Presentation
Team MSUFCU
Project Plan Presentation

Screen Mockup: Web Admin Portal
Team MSUFCU  
Alpha Presentation
Alexa, transfer $500 from my checking account to another checking account.

Welcome, Kathryn. How may I help you?

Please enter the account number of the account you would like to transfer to.

Please confirm transferring $500 from your checking account.
Team MSUFCU
Alpha Presentation

Android App
Team MSUFCU Alpha Presentation
Team MSUFCU
Alpha Presentation

Facebook Messenger

- Which share would you like to transfer to?
  - Checking
- How much would you like to transfer?
  - 25
- Successfully transferred $25
- Check balance
- Which share would you like to check? You can say Checking, Savings, or the name of another share.
- Checking
- Your account balance is $1325
The Capstone Experience

Team Phoenix Group

Department of Computer Science and Engineering
Michigan State University
Spring 2018
Team Phoenix Group
Project Overview

Customer Service System with Chatbot

• Functionalities
  ▪ Enhance Customer Service Experience
  ▪ Ensure Easy Access to Product User Manuals
  ▪ Answer Customer Questions via Chatbot

• Features
  ▪ Create Web and Android Apps
  ▪ Manage Quick Reference Guides (QRCs)
    o Ingest by Photo or PDF
    o Determine Keywords via OCR
    o Search via Text and Voice
    o Display Like E-Book
  ▪ Provide Companion Administrative App
  ▪ Implement Chatbot on Corporate Website
    o Product Inventory
    o Available QRCs
    o Various Frequently Asked Questions (FAQs)
  ▪ Drive Customers to Contact Sales Reps

• Technologies
  ▪ CSS / HTML / PHP / JavaScript
  ▪ Google Android Tablets and Phones / Java
  ▪ Microsoft Bot Framework
  ▪ Microsoft Language Understanding Intelligent Service (LUIS)
  ▪ Docker
  ▪ Kubernetes
  ▪ MongoDB
  ▪ Optical Character Recognition (OCR)
Team Phoenix Group
James Finch, Sarah Fillwock, Dan Shumaker, Fatema Alsaleh, Aman Goshu
Team Phoenix Group
Project Plan Presentation

Screen Mockup: QRG Home Screen
Team Phoenix Group
Project Plan Presentation
Team Phoenix Group
Project Plan Presentation
Team Phoenix Group
Project Plan Presentation

Screen Mockup: QRG Edit Screen

Quick Reference Guide Viewer

manufacturer
Verifone

terminal type
VX 680

application type
Retail

product number
0300034

version
XEVA440

Add comment ...
Team Phoenix Group
Alpha Presentation
Team Phoenix Group
Alpha Presentation

QRG Viewer Home Screen
Team Phoenix Group
Alpha Presentation

QRG Viewer View Screen
Team Phoenix Group
Alpha Presentation
The Capstone Experience
Team Phoenix Group
Alpha Presentation

Customer Service Chatbot

The Phoenix Group
Rising to new levels in POS delivery

Welcome to
THE PHOENIX GROUP

Search Products
Browse Products
Our Services
About
Login
TPG Canada

Hello

Good day! This is the Phoenix Chatbot. How can I help you?

I would like to place an order

There are a few ways to order: Call, 866-559-7572; Fax, 636-329-1710; Email, orders@phoenixgrouppos.com. After you have a TPG Customer ID, you can place an order through our TPG Elite online portal.
The Capstone Experience

Team Proofpoint

Department of Computer Science and Engineering
Michigan State University
Spring 2018
GARTNER MQ LEADER IN ENTERPRISE INFORMATION ARCHIVING FOR 6 YEARS RUNNING

GET THE GARTNER REPORT
Team Proofpoint
Project Overview

Next Generation Malware Analysis Platform

• Functionalities
  ▪ Process Millions of Malware Samples Daily
  ▪ Develop New and Innovative Techniques

• Features
  ▪ Build Lifecycle Processing Dashboard
  ▪ Leverage Many Malware Tools
  ▪ Create Malware Signatures Automatically
  ▪ Identify “Like” Samples and Clusters
  ▪ Visualize Malware Clusters
    o Provide Drill Down Capability
    o Show Signatures Created
  ▪ Prioritize Samples for Further Analysis

• Technologies
  ▪ Malware Sandboxing
  ▪ Network Intrusion Detection Systems (IDS)
  ▪ Statistical Analysis
Team Proofpoint
Graham Thomas, Yash Patel, Crystal Lewis, Brad Doherty, George Zhao
Team Proofpoint
Project Plan Presentation

Screen Mockup: Nodal Graph

Batch Information
Files Processed: 103/250
Time Elapsed: 00:15:23
Flagged Files: 15

Flagged Files
TMP1CE2.TMP
Memo.pdf
DriverPack.exe
Virus.exe
NotSpyware.jar
Team Proofpoint
Project Plan Presentation
Team Proofpoint
Project Plan Presentation

Architecture Diagram

- Malware
- PE Hash
- Static Malware Detection Tools
- Dynamic Decision Logic
- Signature Information Aggregator
- Malware Sandbox
- SQLite
- Database Server
- Postman API
- Web Server
- Apache
- Bootstrap Javascript Framework
Team Proofpoint
Project Plan Presentation

Screen Mockup: File Analysis

Batch Information
Files Processed: 103/250
Time Elapsed: 00:15:23
Flagged Files: 15

File Analysis
File Name: WannaCry.exe
File Signature: File matched known signature of Ransom.WannaCry
Behavior Profile: Behaves like a trojan and a worm
File Size: 5.65MB

Flagged Files
TMP1CE2.TMP
Memo.pdf
DriverPack.exe
Virus.exe
NotSpyware.jar
Team Proofpoint
Alpha Presentation
## Analyzed Malware

<table>
<thead>
<tr>
<th>SID</th>
<th>File Name</th>
<th>File Type</th>
<th>Flagged?</th>
<th>YARA Match</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C6A13AFC583109680CCB54FBB2B3D14E4BA06E9C7A363C884B1383C5EE81FAA</td>
<td>PE32 executable (DLL) (GUI) Intel 80386 (stripped to external PDB), for MS Windows</td>
<td>No</td>
<td>XMRIG_Miner</td>
</tr>
<tr>
<td>8</td>
<td>48678EC33D22C571774ACE303C4C771B46C8121FBE46AFA807E54787671DE13</td>
<td>PE32 executable (DLL) (GUI) Intel 80386 (stripped to external PDB), for MS Windows</td>
<td>No</td>
<td>XMRIG_Miner</td>
</tr>
</tbody>
</table>
### In-Depth Analysis of 6BDE693CE8EB45445C0B38E3DE3AF97E0D21C8D3D33E8408B52E711EA67ABFD27

<table>
<thead>
<tr>
<th>File Information</th>
<th>Statistic Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>File Extension</td>
<td>PE32+ executable (console) x86-64 for MS Windows</td>
</tr>
<tr>
<td>File Size</td>
<td>330.8 KB (310752 bytes)</td>
</tr>
<tr>
<td>Total Analysis Time</td>
<td>0:00:00:295</td>
</tr>
<tr>
<td>Static Analysis Time</td>
<td>0:00:00:295</td>
</tr>
<tr>
<td>Dynamic Analysis Time</td>
<td>0:00:00</td>
</tr>
</tbody>
</table>

### File Hashes

<table>
<thead>
<tr>
<th>Hash Types</th>
<th>File Hash</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE Hash</td>
<td>3N9K8g0TEU3I@0K3hZI9gMNfK58RP3dGq YRIR + Ajg7v4N7ENb08JIRAS41qshWBP+yf</td>
</tr>
<tr>
<td>SHA256</td>
<td>6BDE693CE8EB45445C0B38E3DE3AF97E0D21C8D3D33E8408B52E711EA67ABFD274</td>
</tr>
<tr>
<td>SHA1</td>
<td>82Q9F3CP49B731H2O8BA36TED9C2948B40676</td>
</tr>
<tr>
<td>MD5</td>
<td>08C8609A69A30F189C0D6E6E31C8D3</td>
</tr>
</tbody>
</table>

### Similar Malware

<table>
<thead>
<tr>
<th>File Name</th>
<th>PE Hash</th>
</tr>
</thead>
<tbody>
<tr>
<td>317EB99D1F896B85F4630E39219C948B1D08E9D09A2308C1A4E135ABB9133A67</td>
<td>3N9K8g0TEU3I@0K3hZI9gMNfK58RP3dGq YRIR + Ajg7v4N7ENb08JIRAS41qshWBP+yf</td>
</tr>
<tr>
<td>4E33D2236DC52AD5DE152591A4A3964720322CF9336F02742DE3C27E9B83E6A</td>
<td>3N9K8g0TEU3I@0K3hZI9gMNfK58RP3dGq YRIR + Ajg7v4N7ENb08JIRAS41qshWBP+yf</td>
</tr>
<tr>
<td>695C7B02EB9F73B8B15E373C70A6696D013CD4A3CE777AC9F89F337704271716</td>
<td>3N9K8g0TEU3I@0K3hZI9gMNfK58RP3dGq YRIR + Ajg7v4N7ENb08JIRAS41qshWBP+yf</td>
</tr>
</tbody>
</table>

---

**Team Proofpoint**

**Alpha Presentation**

In Depth Analysis of a File
The Capstone Experience

Team Quicken Loans

Department of Computer Science and Engineering
Michigan State University
Spring 2018
Providing Affordable Mortgages and Award-Winning Client Service for More than 30 Years
Functionality:

- Enable Collaborative New Home Construction
- Include All Players

Features:

- Create Responsive Web App
- Allow Choice of Home Model, Exterior and Interior
- Support Various Roles
  - Home Buyer
  - Builder
  - Multiple Contractors
  - City Inspector
- Use Dynamic Workflow
- Alert Players When Action Assigned or Due
- Provide Full Transparency
  - Deliverables
  - Milestones
  - Workflow
  - Complete Transaction History
- Utilize Blockchain for Storage
  - Home Buyer’s Build Requirements
  - Workflow Tasks

Technologies:

- CSS / HTML / JavaScript / AngularJS
- Microsoft .NET
- Blockchain
- Hyperledger
- Microsoft Azure or Amazon Web Services (AWS)
Team Quicken Loans
Vishal Adusumilli, Riley Annis, Erin O'Hara, Turner Anderson, Jaiwant Bhushan
Team Quicken Loans
Project Plan Presentation

Screen Mockup: User Login

Fundamenta by Quicken Loans

Username
Enter a username...

Password
Enter a password...

Role
- Home Buyer
- Builder
- Contractor

Log In or Sign Up
Team Quicken Loans
Project Plan Presentation

Architecture Diagram

Web App
- React JS
- .NET Core
- Service Layer
- Database Layer
  - SQL Server
  - SQL Database

Hyperledger
- Fabric
  - Blockchain
  - Chaincode
  - Blockchain State Storage
- Composer
  - Business Network Model
  - Transactions
  - Access Control
  - Identities
  - REST Server

REST API

Azure
Team Quicken Loans
Project Plan Presentation
Team Quicken Loans
Project Plan Presentation

Screen Mockup: Build Workflow

Fundamenta by Quicken Loans

House Options
- Model +
- Exterior +
- Interior +

Conversation
- Home Buyer
  How much longer?
- Builder
  I'll let the contractor answer.
- Contractor
  About 1 month left.
- Home Buyer
  Great, thank you!

Cancel
Save

Submit
Team Quicken Loans
Alpha Presentation

Sign Up
Team Quicken Loans
Alpha Presentation

Dashboard
Team Quicken Loans
Alpha Presentation
The Capstone Experience

Team Rook

Department of Computer Science and Engineering
Michigan State University
Spring 2018
ROOK SECURITY
OPTIMIZE SECURITY OPERATIONS

Force is a Security Operations Management Platform that equips your team for success by optimizing security resource workflows, metrics, and outcomes.
Team Rook
Project Overview

Endpoint Data Monitoring and Analysis Agent

• Functionalities
  ▪ Detect and React to Security Threats
  ▪ Capture and Analyze Agent Health Metrics and Log Files

• Features
  ▪ Create Endpoint Dashboard
    o Enable Remote Agent Configuration
    o Do Health Checks and Data Analysis
    o Display Health Check Information
    o Create Alert Thresholds.
  ▪ Store Metrics and Log Files
    o RESTful Endpoint
    o Amazon Simple Storage Service (S3)
    o Locally
  ▪ Implement State Awareness
  ▪ Support Cross Platform Compatibility
  ▪ Integrate with Rook’s Force Platform

• Technologies
  ▪ Force Platform
  ▪ Go
  ▪ JavaScript / JSON
  ▪ Python / Django
  ▪ React / Redux
  ▪ Ubuntu 16.04
  ▪ Amazon Simple Storage Service (S3)
  ▪ RESTful Web Services
Team Rook
Jeremy Specht, Bohao Gao, Vikram Thakur, Jared Clark, Drew Gilbertson
Team Rook
Project Plan Presentation

Screen Mockup: System Health
Screen Mockup: System Health

Specify range of time
Select individual logs
Configure Agent
System health
Log Source Info
Alerts
System Health
Log Source
Specify range of time
Select individual logs

Team Rook
Project Plan Presentation
Team Rook
Project Plan Presentation

Architecture Diagram

- **Lambda**
- **S3 API**
- **REST API**
- **React JS**
- **elasticsearch**
- **django**
- **S3**
- **Agents**
- **Local Storage**
Team Rook
Project Plan Presentation
Team Rook
Project Plan Presentation

Screen Mockup: Configuration
Team Rook
Alpha Presentation
Team Rook
Alpha Presentation

Storage System
The Capstone Experience

Team SpartanNash

Department of Computer Science and Engineering
Michigan State University
Spring 2018
Volunteer Tracking System

**Functionalities**
- Simplify Tracking of Associate Volunteer Hours
- Use Web and Mobile Apps

**Features**
- Create Apps for Volunteer Reporting
  - Web
  - Apple iOS
  - Google Android
- Handle Various Inputs
  - Associate ID
  - Name and Location of Place
  - Type of Service
  - Number of Hours
- Track Hours
- Enable Photo and Video Uploading
- Utilize Geolocation for Easy Location Reporting
- Gamify with Badging and Leader Board
- Send Notifications
  - Volunteers
  - Program Facilitators
- Build Companion Web Administrative App

**Technologies**
- CSS / HTML / JavaScript
- Apple iOS / Swift
- Google Android / Java
- React Native
- MySQL
Team SpartanNash
Tianyi Li, Aleks Bonev, Abbott Wang, Denis Andreev, Nino Candela
Team SpartanNash
Project Plan Presentation

Screen Mockup

LeaderBoard

Timeline/Newsfeed

Lorem ipsum dolor sit amet et delectus

Username
Name

Feed

Lorem ipsum dolor sit amet et delectus
Team SpartanNash
Project Plan Presentation
Team SpartanNash
Project Plan Presentation

Architecture Diagram

MySQL

SpartanNash inSite APIs

Mobile Applications
  - React-Native
  - Android App
  - IOS App

Websites
  - HTML/PHP
  - Web Form
  - Admin Panel
Team SpartanNash
Project Plan Presentation
Team SpartanNash
Project Plan Presentation

Screen Mockup

Username
Password

SIGN IN

Forget your Password?
Recover

Organization Name *
Enter The Organization Name

Volunteer Activity or Event Name *
Enter The Event Name

Area of support *
None selected
Area not on the list (optional)
Enter the areas

Commitment *
One Time

Date of Event *
01/29/2018

Hour of Event *

Message
Enter extra message here...

Submit →
Team SpartanNash Alpha Presentation
Team SpartanNash
Alpha Presentation

Website Admin Panel
Team SpartanNash
Alpha Presentation

Newsfeed and Profile
Team SpartanNash
Alpha Presentation
Volunteer Tracking Form
The Capstone Experience

Team Spectrum Health

Department of Computer Science and Engineering
Michigan State University
Spring 2018
Team Spectrum Health
Project Overview

Spectrum Health Go

• Functionalities
  - Improve Patient and Visitor Experience
  - Help Navigate Spectrum Health Facilities

• Features
  - Create Apple iOS and Google Android Apps
  - Provide Real-Time On-Screen Directions
  - Guide via Pre-Configured Waypoints
  - Use Optical Character Recognition (OCR)
  - Collect Anonymous Route Data
  - Provide Administrative Web App
    - Create and Print Waypoints
    - Configure and Improve Routes
    - Add New Locations and Routes

• Technologies
  - CSS / HTML / JavaScript
  - Apple iOS / Swift
  - Google Android / Java
  - Microsoft .NET / C#
  - Microsoft SQL Server
  - Microsoft Azure
  - GitHub / ZenHub
  - Optical Character Recognition (OCR)
  - Identity Server
Team Spectrum Health
Andrew Astakhov, Collin Skonieski, Rachel Polus, Pierce Neal, Xin Zhao
Team Spectrum Health
Project Plan Presentation

Screen Mockup: Android App
Team Spectrum Health
Project Plan Presentation

Architecture Diagram

- Azure
- Web Application
  - ASP.NET
  - REST API
- SQL Database
- iOS Application
  - ALAMOFIRE
- Android
  - Retrofit
Team Spectrum Health Project Plan Presentation
Team Spectrum Health
Project Plan Presentation

Screen Mockup: Web App

SpectrumGO LOBBY Waypoint

Paths

- To Operating Room
  - Directions: Turn left. Walk forward until
  - Angle: -90
  - Update

- To Nursing Ward
  - Update

- To Cardiology
  - Directions: Turn right. Walk forward
  - Angle: 90
  - Update

- To Pharmacy
  - Directions: Take the first
  - Angle: 180
  - Update

- Directions: Take the staircase on your
  - Angle: 45

Add | Delete
Team Spectrum Health
Alpha Presentation

SpectrumGO Management Portal

Manage Facilities

Manage Waypoints
Manage Connections
Manage Pathways

© 2018 - Spectrum Health Go 2018
Team Spectrum Health
Alpha Presentation

iOS Application

SPECTRUM HEALTH
Select Facility
Select Destination

SPECTRUM HEALTH
Select Facility: MSU
Select Destination:

SPECTRUM HEALTH
waypoint 1
waypoint 2
waypoint 3

SPECTRUM HEALTH
Spectrum GO
Turn Left
Stop
Team Spectrum Health
Alpha Presentation
Team Spectrum Health
Alpha Presentation

Android Application
The Capstone Experience

Team Symantec

Department of Computer Science and Engineering
Michigan State University
Spring 2018
Securing the Cloud Generation

Fueled by the world's largest civilian threat intelligence network

LEARN MORE
Detecting Security Threats from User Authentications

• Functionalities
  ▪ Detect Security Threats
  ▪ Use Symantec Validation and ID Protection (VIP)
  ▪ Visualize VIP Authentication Patterns

• Features
  ▪ Ingest VIP Reporting Service Log Data
  ▪ Create Operational Dashboard with Alerting
    o Number of Authentications Per Time Unit
    o Successful vs Failed Authentications
    o Unique Users Per Time Unit
    o Distribution of Risk Reasons
  ▪ Create Security Dashboard and Alerting
    o Trends of Failed Authentications
    o Find Risky Users
    o Flag Increases in Credential Use
  ▪ Integrate with Splunk Enterprise and Splunk Cloud

• Technologies
  ▪ Symantec VIP Reporting Service
  ▪ Splunk
  ▪ Amazon Web Service (AWS)
  ▪ RESTful Web Services
  ▪ Elastic Search, Kibana, Logstash
  ▪ Apache Spark
Team Symantec
Robert Novak, Abby Urbanski, Stephen Alfa, Keerthana Kolisetty, Echo Wu
Team Symantec
Project Plan Presentation

Screen Mockup: Dashboard in Splunk

Operational Trends
Panels that display basic statistics of VP authentications

Authentications Across Different Device Types

- 19,809

Total Number of Authentications

Success vs. Failure Authentications

Number of Authentications Over Last Seven Days

Success vs Fail Attempts For Each Device Type
Team Symantec

Project Plan Presentation

Architecture Diagram

-powered by Symantec-

Symantec VIP services

Two-factor authentication

Data & Event Logs

VIP Reporting Client

Splunk

Data Documents

ELK

Establish

AWS

Powered by MSU Team Symantec

Customers

Internet
Team Symantec
Project Plan Presentation

Screen Mockup: Dashboard in ELK
Team Symantec
Alpha Presentation

Splunk Dashboard
Team Symantec Alpha Presentation

ELK Dashboard

Dashboard / Operational Dashboard

Search... (e.g. status:200 AND extension:PHP)

Add a filter

Record Count

6,226
Record Count

Number of Users

477
Number of Users

Authentication Status

Success
User does not have a...

Authentications per Hour

Number of Authentications

Users Created Over Time

The Capstone Experience
Team Symantec
Alpha Presentation

ELK Alerting on Slack
The Capstone Experience

Team TechSmith

Department of Computer Science and Engineering
Michigan State University
Spring 2018
Create Powerful Visuals. No Design Skills Needed.

TechSmith makes it simple for everyone to create high-quality screenshots, screencasts, and videos.

Shop Now
Snagit and Camtasia Output Extensibility

• Functionalities
  ▪ Simplify Sharing of Media Produced by TechSmith Products
  ▪ Extend Output Capabilities of Snagit and Camtasia

• Features
  ▪ Use TechSmith Extensibility Framework
  ▪ Build Three Plugins
    ○ TechSmith Video Review
    ○ Wistia
    ○ Student Choice
  ▪ Design Highly Polished User Experience (UX)
  ▪ Provide Media Upload Service with Link
  ▪ Create Independent Test Harness

• Technologies
  ▪ Microsoft .NET / C#
  ▪ Windows Presentation Foundation (WPF)
  ▪ TechSmith Cloud SDK
  ▪ TechSmith Extensibility Framework (TEF)
  ▪ Managed Extensibility Framework
Team TechSmith
Ryan Schiller, Logan Arent, Collin Dillinger, Carter Chamberlain
Team TechSmith
Project Plan Presentation

Screen Mockup: Output Mockups
Team TechSmith
Project Plan Presentation
Team TechSmith
Project Plan Presentation

Architecture Diagram

TechSmith Desktop Applications

TechSmith Extensibility Framework

Windows Desktop

Snagit

Camtasia

WISTIA

TechSmith Video Review

imgur

Media Hosting APIs
Team TechSmith
Project Plan Presentation
Team TechSmith
Project Plan Presentation

Screen Mockup: Test Harness

Test Harness

Choose File ...

XXX
Media
Thumbnail
XXX

Output To:

TechSmith Video Review
Wistia
Imgur

C:Users\Capstone\Images\
Team TechSmith
Alpha Presentation
Team TechSmith
Alpha Presentation

SnagIt Share Menu
TechSmith Video Review

Team TechSmith
Alpha Presentation
Team TechSmith
Alpha Presentation
Team TechSmith
Alpha Presentation

Test Harness
The Capstone Experience

Team Union Pacific

Department of Computer Science and Engineering
Michigan State University
Spring 2018
The Spirit Locomotive Honors U.S. Armed Forces

Locomotive No. 1943, The Spirit, spotlights Union Pacific's relationship with thousands of veterans who helped build America after defending the United States – a tradition dating back to the company's founding. Find out more.
Team Union Pacific
Project Overview

“Alexa, what’s my work schedule look like?”

• Functionalities
  ▪ Provide Information About Upcoming Work Assignments
  ▪ Utilize Voice Activated Digital Assistant
  ▪ Target Trainmen, Yardmen and Enginemen (TY&E)

• Features
  ▪ Create Suite of Mobile Apps
    ▪ Responsive Design
    ▪ Support Apple iOS and Google Android Devices
  ▪ Manage Users
    ▪ Register
    ▪ Identify
    ▪ De-Activate
  ▪ Support All Major Voice Interfaces
    ▪ Amazon Echo
    ▪ Google Home
    ▪ Apple Siri
    ▪ Microsoft Cortana
  ▪ Use JSON Web Services
  ▪ Write Documentation for Each System

• Technologies
  ▪ Java
  ▪ JavaScript / AngularJS
  ▪ Amazon Echo
  ▪ Google Home
  ▪ Apple Siri
  ▪ Microsoft Cortana
  ▪ Natural Language Processing (NLP)
Team Union Pacific
Jared McMillan, Daniel Agbay, M Kim, David Hubble, Austin McGee
Team Union Pacific
Project Plan Presentation

Screen Mockup: Mobile Application
Screen Mockup: Mobile Application

Failed Case

Success Case

Failed Case

Team Union Pacific
Project Plan Presentation
Team Union Pacific Project Plan Presentation
Alexa, open the PST app.

Hello Sparty, what can I help for you today?

What’s my times out?

You are currently 4th out right now.

Thanks, that’s all.
Team Union Pacific
Alpha Presentation

Google Assistant Interaction

Hello Team Union Pacific, welcome to PSTechnologies Schedule App Alpha! You can request information about a train lineup or request your current position in the employee queue.

please show me train line up 1234

Ok! Here is information for lineup 1234. Train QWE456, departure time 9:00 a.m. Train ABC123, departure time 12:00 p.m. Train PIP987, departure time 1:00 p.m. Is there anything else I can do for you?

yeah what’s my current position

Your current position is 10th.

Hello Team Union Pacific, welcome to PSTechnologies Schedule App Alpha! You can request information about a train lineup or request your current position in the employee queue.

please show me train line up 1234

Ok! Here is information for lineup 1234. Train QWE456, departure time 9:00 a.m. Train ABC123, departure time 12:00 p.m. Train PIP987, departure time 1:00 p.m. Is there anything else I can do for you?

yeah what’s my current position

Your current position is 10th.

Sure. Getting the test version of my test app.

Hello Team Union Pacific, welcome to PSTechnologies Schedule App Alpha! You can request information about a train lineup or request your current position in the employee queue.

please show me train line up 1234

Ok! Here is information for lineup 1234. Train QWE456, departure time 9:00 a.m. Train ABC123, departure time 12:00 p.m. Train PIP987, departure time 1:00 p.m. Is there anything else I can do for you?

yeah what’s my current position

Your current position is 10th.
Alexa, open my PST app.
Welcome to PST application, you may request train lineup info or your queue position.
Show me train lineup 1234.
Here is train lineup 1234: MSU2018, departure time 10:00am, ABC123 departure time 3:00pm.
Would you like to check other things?
Yes, what's my position?
You are 5th.
Would you like to check other things?
Stop.
Team Union Pacific
Alpha Presentation
The Capstone Experience

Team Urban Science

Department of Computer Science and Engineering
Michigan State University
Spring 2018
EVERYONE HAS AN OPINION. WE HAVE SCIENCE.

Since the day we started, we’ve been a force for change. We started with a problem to solve. We scrutinized it, developed a theory, tested it and applied the solution. And we have the same approach today, we listen to our clients’ needs and find a solution. We’re curious, objective, empirical and determined. Through this spirit, we invented The Power of 4™ formula to bring scientific discipline to the business world. It’s how we are Guiding Business Through Science.
Mobile Maestro

• Functionalities
  ▪ Control Maestro Exoskeletal Arm
  ▪ Use Mobile App with Voice Input

• Features
  ▪ Handle Various Arm Controls
    o Up, Down, Lock
    o Lock, Standby
  ▪ Provide Voice Control
    o Safe Word for Home/Reset Position
    o All Functions
  ▪ Implement Self-Leveling with Calibration
  ▪ Support Apple iOS and Google Android
  ▪ Collect Usage Statistics

• Technologies
  ▪ Maestro Exoskeletal Arm
  ▪ CSS / HTML / JavaScript
  ▪ Microsoft .NET / C#
  ▪ Apple iOS / Swift
  ▪ Google Android / Java
  ▪ Bluetooth Low Energy (BLE)
  ▪ Natural Language Processing (NLP)
Team Urban Science
Mustafa Jebara, Dane Rosseter, Samantha Oldenburg, Alex Wuillaume, Shun Ran
Team Urban Science
Project Plan Presentation

Screen Mockup: Home Screen
Team Urban Science
Project Plan Presentation

Architecture Diagram

Azure

Internet

SQL

Bluetooth

Commands
Team Urban Science
Project Plan Presentation
Team Urban Science
Project Plan Presentation

Screen Mockup: Leveling Settings

Adjust leveling calibration

Raise

Lower
Team Urban Science
Alpha Presentation
Team Urban Science
Alpha Presentation

No Buttons Active
Team Urban Science
Alpha Presentation

Up and Lock Active
Team Urban Science
Alpha Presentation
The Capstone Experience

Team USAA

Department of Computer Science and Engineering
Michigan State University
Spring 2018
WE PROUDLY SERVE MILITARY MEMBERS AND THEIR FAMILIES

Since 1922, we have stood by our members. We've provided years of guidance and assistance — from helping establish financial independence, to raising a family, to retirement.

WHO WE SERVE
LIMElight: Life Insurance Made Easy

- Functionalities
  - Obtain Life Insurance Quote
  - Improve the Experience
    - For Applicant
    - For Insurer
  - Decrease Duration, Complexity and Cost

- Features
  - Provide Smooth User Experience
    - Responsive Web
    - Native Apple iOS and Google Android Apps
  - Generate Personalized Quote
    - Use Minimal Inputs from Applicant
    - Leverage Machine Learning
    - Match Underwritten Premium Closely
  - Create Health Record Blockchain
    - Controlled by Applicant
    - Ensure Privacy and Security
    - Accessible via RESTful API

- Technologies
  - Apple iOS / Swift
  - Google Android / Java
  - Blockchain
  - Machine Learning / Python
  - Microsoft Azure
  - RESTful Web Services
  - JavaScript / REACT / Angular 2+ / Vue
Team USAA
Xingchi Zhou, Nathaniel Finley, Abe Ahmed, Mike Ronayne, Dong Lee
Team USAA

Project Plan Presentation

Screen Mockup: Quoting Process

Get a Term Life Insurance Quote

- Age: 37
- Weight: 180
- Height: 6'1"

Do you smoke? No
Do you exercise? Yes

GET A QUOTE
Team USAA
Project Plan Presentation
Team USAA
Project Plan Presentation
Architecture Diagram

Frontend Web Application (Azure)

React

Execute Smart Contract

*Get Health Record
*Modify Permissions

Blockchain Backend (Azure)

REST API

Ethereum

Data

Execute Smart Contract

Machine Learning Backend (Azure)

REST API

Azure Functions

Machine Learning

Data

Result

Quote

User Input
Team USAA
Project Plan Presentation

Screen Mockup: Patient Login

Manage Who Can View Your Health Records

<table>
<thead>
<tr>
<th>Entity</th>
<th>Permission</th>
</tr>
</thead>
<tbody>
<tr>
<td>USAA</td>
<td>Y</td>
</tr>
<tr>
<td>Sparrow Health</td>
<td></td>
</tr>
</tbody>
</table>

Update
Team USAA
Alpha Presentation

Get a Life Insurance Quote

- Age: [Select Age]
- Height (in feet): [Enter Height]
- Height (in inches): [Enter Height]
- Married: [Yes/No]
- Gender: [Female/Male]
- Travel Internationally?: [Yes/No]
- Earned Bachelor's Degree?: [Yes/No]

GET A QUOTE
Quote Result

USAA

Quoted Monthly Payment

$60/Month

Quote ID

89437

Next Steps
Contact USAA today with your Quote ID to get started
800-531-USAA
Do not delete this textbox. It's used as a marker in VB code.

See VB Module UTL_PresentationSlidesSend2FB.
Team USAA
Alpha Presentation

Patient Blockchain View

Welcome Bob Jones
Your ID: bob@gmail.com

Your Authorized Practitioners

dr.kelly@sparrow.org
Revoke Access

Authorize A Practitioner
Here is a list of practitioners you may authorize

Dr. Ted Seuss
Authorize
The Capstone Experience

Team Yello

Department of Computer Science and Engineering
Michigan State University
Spring 2018
yello
Humanize
The Candidate Experience

Provide unprecedented speed and transparency throughout the candidate journey
Team Yello
Project Overview

InViAnTo: Interview Video Analysis Tool

• Functionalities
  ▪ Evaluate Video Interview Automatically
  ▪ Include Sentiment and Emotional Analysis

• Features
  ▪ Design and Build Web App
    o Record Live Video
    o Support Prerecorded Video
    o Enable Viewing and Rerecording by Applicant
  ▪ Transcribe All Recordings and Store with Video
  ▪ Apply Sentiment Analysis on Transcription
  ▪ Run Emotion Detection on Audio and Video
  ▪ Provide Administrative Web App
    o To View Results
    o By Hiring Team

• Technologies
  ▪ CSS / HTML / JavaScript / JSON
  ▪ Ruby on Rails
  ▪ Microsoft Azure Emotion API
  ▪ Microsoft Language Understanding Intelligent Services (LUIS)
  ▪ Machine Learning
    o TensorFlow
    o scikit-learn

InViAnTo: Interview Video Analysis Tool

Project Overview

Team

Yello

Chicago, Illinois
Team Yello
Jonathon Zeitler, Leo Yao, Jenn Proos, Quan Zhou, Brian Wang
Team Yello
Project Plan Presentation

Screen Mockup: Staff Management Page

Yello Capstone
Michigan State University
CSE 498

Follow Us!
Team Yello
Project Plan Presentation
Team Yello
Project Plan Presentation

Architecture Diagram

- PostgreSQL (Database)
- open.tok (Video Capture)
- Video Analysis
- Analysis Results
- Web Application
- Server
- Heroku
- Azure
  - Storage
  - Video Indexer API
  - Text Analytics API
  - Emotion API
Team Yello
Project Plan Presentation
Team Yello
Project Plan Presentation

Screen Mockup: Interview Recording Page

Question 1
Talk about your self
Team Yello
Alpha Presentation
Managing Interviews

**Data Analytics Scientist**

*Author: Bob (bob@recruiter.co)*

We are looking for a qualified data scientist to apply his or her expertise in quantitative analysis, data mining, and the presentation of data to see beyond the numbers and understand how our users interact with both our consumer and business products.

**Facebook Web Designer**

*Author: Bob (bob@recruiter.co)*

We are looking for an experienced developer to design and create web interfaces using Javascript, HTML5, and CSS.

**Google Software Engineer**

*Author: Susan (susan@recruiter.co)*

We are looking for an engineer with extensive experience in web development.
Editing An Interview

Question 1:
Think about an instance in which you came up with a project idea which was implemented primarily because of your efforts. What was it about? What was its outcome? What was your role?

Question 2:
Describe a situation in which you met a major obstacle in order to complete a project. How did you deal with it? What steps did you take?

Question 3:
Tell about an instance when you had to communicate a really bad piece of news to your supervisor or team members. How did you handle it? What was the outcome?
The Capstone Experience

Dr. Wayne Dyksen
Department of Computer Science and Engineering
Michigan State University
Spring 2018
The Capstone Experience Lab
The Capstone Experience Lab
The Capstone Experience Lab
The Capstone Experience Lab
The Capstone Experience Lab
View of Spartan Stadium
The Capstone Experience

Design Day Award Winners

April 28, 2017
All-Hands Design Day, April 28, 2017
Auto-Owners Exhibition Award
Team TechSmith, Spring 2017
Teacher’s Virtual Toolbelt
Alex Crimin, Zeke Zandbergen, Yang He, Ryan Cornillie
Presented by Scott Lake of Auto-Owners Insurance
MSU Federal Credit Union Praxis Award
Team Union Pacific, Spring 2017
Learning New Train Routes
Matthew Schleusener, Kangjie Mi, Nick Summers, Jon Wild
Presented by Liam Petraska of MSU-Federal Credit Union
Urban Science Sigma Award
Team Michigan State University, Spring 2017

CATAlyst: Mapping CATA Buses in Real-Time
Charlie Ward, Cathy Dinsmoor, Tom Beaver, Jimmy Mkude, James Dodge
Presented by Linda Koepppe and Luke Mercier of Urban Science
The Capstone Experience

Design Day Award Winners

December 8, 2017
Auto-Owners Exhibition Award
Team Amazon, Fall 2017

Faia: Fashion Artificial Intelligence Assistant
David He, Dominic Zottolo, Zizhen Wang, Danielle Schugars, Nikhil Ramu

Presented by Ross Hacker and Scott Lake of Auto-Owners Insurance
MSU Federal Credit Union Praxis Award

Team Yello, Fall 2017

Automatic Resume Verification

Brandon Burt, Ryan Nagy, Giorgio Maroki, Nathaniel Hagan, Wan Kim

Presented by April Clobes of MSU Federal Credit Union
TechSmith Screencast Award
Team Union Pacific, Fall 2017
RailBuilder: The Great Race to Promontory
Declan McClintock, Jacob Young, Zachary Brenz, Kyle Bush, Trever Daniels
Presented by Matt Dupuis of TechSmith
Urban Science Sigma Award
Team Michigan State University, Fall 2017
SEA: Spartan Experience App
Nayana Kodur, Patrick Pale, Roy Perryman, Ryan Johnson, Scott Swarthout
Presented by Elizabeth Klee of Urban Science
The Capstone Experience

Dr. Wayne Dyksen
Department of Computer Science and Engineering
Michigan State University
Spring 2018
accenture
Auto-Owners
INSURANCE
LIFE • HOME • CAR • BUSINESS
Michigan State University Federal Credit Union
Building Dreams Together
UNION PACIFIC

BUILDING AMERICA®
yello