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
    - Status Report Presentations
    - Formal Presentations
      - Project Plan
      - Alpha
      - Beta
    - 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.
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

Malware Sample Search

- **Sample ID:**
  - Strong Password: ID 000000
  - Custom: 14
  - File Test: ID 000000
  - Custom: 0
  - Slack Install: ID 000000
  - Required Software: 1
  - Custom Foo: ID 000000
  - Custom: 32
  - api-manual: ID 000000
  - Patch: 22

File Information:
- **File Name:** 040d71e56512ao786bcs.xls
- **File Size:** 77824 bytes
- **File Mime:** application/vnd.ms-excel
- **File Type:** Composite Document File V2 Document
- **MD5:** 040d71e56512ao786b
- **SHA1:** a4jn4kn34mk34kmk34mk3443mk
- **First Seen:** 2014-07-10 22:39:21
- **Last Seen:** 2014-07-10 22:39:21
- **Notes:**
Team Accenture Project Plan Presentation
Team Accenture Project Plan Presentation
Team Accenture
Project Plan Presentation

Screen Mockup: AMAP Dashboard

Malware Processed Per Hour

Container Status

- Starting Up: 4%
- Running: 18%
- Idle: 2%
Team Accenture Alpha Presentation
The Capstone Experience

Team Accenture
Alpha Presentation

Current Process Status Page

![Screenshot of Accenture dashboard with analysis status table.](image-url)
Team Accenture
Alpha Presentation
The Capstone Experience

Team Amazon

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

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
Zach Whitener, Hansheng Zhao, Dillon Stock, Cam Korzecke, Chess Luo
## Team Amazon

### Project Plan Presentation

**Screen Mockup: Web App Dashboard**

- **Title:** NPR - Planet Money
- **Status:** Comprehending
- **Created Time:** 2018-01-10, 8:00PM

<table>
<thead>
<tr>
<th>Title</th>
<th>Status</th>
<th>Created Time</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>#820 P is For Phosphorus</td>
<td>Transcribing</td>
<td>2018-01-26, 8:00PM</td>
<td></td>
</tr>
<tr>
<td>#819 Tax Me if You Can</td>
<td>Comprehending</td>
<td>2018-01-24, 8:56PM</td>
<td></td>
</tr>
<tr>
<td>#508 A Bet On The Future</td>
<td>Comprehending</td>
<td>2018-01-10, 8:00PM</td>
<td></td>
</tr>
<tr>
<td>#818 The Problem Of Rapt</td>
<td>Transcribing</td>
<td>2018-01-17, 8:00PM</td>
<td></td>
</tr>
<tr>
<td>#817 The Gun Man</td>
<td>Completed</td>
<td>2018-01-12, 8:00PM</td>
<td></td>
</tr>
<tr>
<td>#489 The Invisible Plu</td>
<td>Failed</td>
<td>2018-01-10, 8:00PM</td>
<td></td>
</tr>
<tr>
<td>#816 Bitcoin Loser</td>
<td>Completed</td>
<td>2018-01-05, 8:00PM</td>
<td></td>
</tr>
</tbody>
</table>
Team Amazon
Project Plan Presentation

Architecture Diagram

Web Application

Amazon RDS

Store data
Retrieve data

Python Django API
Running on an EC2 Instance

dj

Update job progress
Add job to respective queue

Lambda Microservices

Transcribe
Comprehend
Product Search

Request data

JSON response

Retrieve file contents
Store file

Amazon S3

Begin Transcribe
Begin Comprehend
Begin Product Search
Team Amazon
Project Plan Presentation
Team Amazon
Project Plan Presentation

Screen Mockup: Podcast Details Page
Team Amazon
Alpha Presentation
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.
Team Amazon
Alpha Presentation

Product Detail Page
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
A P T I V
Team Aptiv
Project Overview

Automotive Gateway Security Analysis

• Functionalities
  ▪ Evaluate Security of Automotive Gateway Module (CyberSecure Gateway)
  ▪ Determine Vulnerabilities via Wireless Connectivity
    o Cellular WAN
    o WiFi
    o Bluetooth

• Features
  ▪ Provide Software for Automated Testing
  ▪ Determine Vulnerabilities
    o Injecting and Running Code
    o From Open Source Software Components
    o HIPS (Host Intrusion Prevention Systems) vs non-HIPS Systems
  ▪ Produce Design and Requirements Documentation
  ▪ Create Software Component List with Version Control

• Technologies
  ▪ Cyber Security
    o Threat Analysis
    o Open Source Analysis
    o Host Intrusion Prevention System (HIPS)
  ▪ Networking (TCP/IP, Routing, Firewalls)
  ▪ Wireless Security and Vulnerabilities
  ▪ CyberSecure GateWay (CSGW)
  ▪ Linux Security
  ▪ Embedded Linux
Team Aptiv
Dillon Brown, Clayton Peters, Ashtaan Rapanos, Winton Qian, Wei Jiang
Team Aptiv
Project Plan Presentation

Screen Mockup: Incomplete Project Page
Team Aptiv
Alpha Presentation
Team Aptiv
Alpha Presentation

Dashboard
Team Aptiv
Alpha Presentation

Product Dashboard

![Product Dashboard Image]
The Capstone Experience

Team Auto-Owners

Department of Computer Science and Engineering
Michigan State University
Spring 2018
Auto-Owners
INSURANCE
LIFE • HOME • CAR • BUSINESS
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
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
  - unity
  - Provides object data and image environments
  - Provides object data and image environments
  - Creates environments, allows user to create and edit object and environment data
- 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
  - Displays panoramic view of uploaded environment and object info
- Oculus Rift Controllers
- Omnidirectional Camera

Do not delete this textbox. It's used as a marker in VB code.
Team Auto-Owners
Project Plan Presentation
Team Auto-Owners
Project Plan Presentation

Screen Mockup: VR User Interface
Team Auto-Owners
Alpha Presentation
### 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
Do not delete this textbox. It's used as a marker in VB code. See VB Module UTL_PresentationSlidesSend2FB.
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
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
    o Non-Certified
    o Certified
  ▪ Handle Various Scenarios
    o Normal Filling
    o Response to Spills
  ▪ Manage Player Points
    o Award for Positive Actions
    o Deduct for Negative Actions
  ▪ Enable Interaction with Game Objects
    o Personal Protective Equipment (PPE)
    o D-Rails
    o 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

Midland, Michigan
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

Architecture Diagram

Software
- Ps
- Audacity
- C#
- 3DS MAX
- Unity

Hardware
- VR
- VRTK
- Steam VR
- Steam
- SDK

Language
- C#

Assets
- Steam
- VRTK
Team Dow
Project Plan Presentation
Team Dow
Project Plan Presentation

Screen Mockup: The Railcar
Team Dow
Alpha Presentation

Loading Area
Team Dow
Alpha Presentation

Load Arm and Spreader
Team Dow
Alpha Presentation
Team Dow
Alpha Presentation

Derailer
The Capstone Experience

Team DRIVEN-4

Department of Computer Science and Engineering
Michigan State University
Spring 2018
DRIVEN-4
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

Screen Mockup: Manufacturing
Team DRIVEN-4
Project Plan Presentation
Team DRIVEN-4
Project Plan Presentation

Architecture Diagram

[Diagram showing the process of producing, streaming, and visualizing using Tecnomatix, the box, and Thingworx studio]
Team DRIVEN-4

Project Plan Presentation

Screen Mockup: AR Service
Team DRIVEN-4
Alpha Presentation
Team DRIVEN-4
Alpha Presentation

Manufacturer’s Web Portal Dashboard
Team DRIVEN-4
Alpha Presentation

Customer Mobile Application
See VB Module UTL_PresentationSlidesSend2FB.

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

Detroit, Michigan
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

Screen Mockup: Web Dashboard

- Microsoft Azure
- Microsoft Azure
- Visual Studio Team Foundation Server

Azure Bot Service

.NET Framework

Microsoft Teams

- [Image of software components and integrations]
Team GM
Alpha Presentation
Team GM
Alpha Presentation

Virtual Machines Dashboard
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
Team Herman Miller
Project Overview

Adjust: Augmented Reality Chair Adjustment

• Functionalities
  ▪ Simplify Adjusting High Performance Office Chair
    o Ergonomic
    o “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)
Screen Mockup: Identifying Chair
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
  - Builds
    - iOS: Xcode
    - Android: Build

Project Components:
- Team Herman Miller
- 3D assets
- Model Target Generator
- Camera Input
- Vuforia
- Unity
- iOS: Xcode
- Android: Build
Team Herman Miller
Project Plan Presentation

Screen Mockup: Interactive 3D Model

Step 1: Height Adjustment
Locate and tap the highlighted height adjustment level on your Aeron chair.
Team Herman Miller
Alpha Presentation
Seat Depth Adjustment

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 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.
Team Herman Miller
Alpha Presentation

Main Menu
The Capstone Experience

Team Meijer

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

save over $50
Team Meijer
Project Overview

Thrifty: 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

Thrifty: Personal Shopping Assistant

Grand Rapids, Michigan
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 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 ___?"
Team Meijer
Project Plan Presentation

Architecture Diagram

- IOS
- Apple Speech
- Android
- Google Speech
- Bluebird
- Microsoft Azure
- Mperks
- SQL
- Competitor Pricing
- LUIS
Team Meijer
Project Plan Presentation
Team Meijer
Project Plan Presentation

Screen Mockup: Functionality

- Soda Pop
  - Here is a list of "Soda Pop" you may tap any of them for more information:
    - Coca-Cola
    - Pepsi
    - Dr. Pepper

- 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
  - mPerks
  - Help

- Competitor Prices on a 24 pack of Coke.
  - Here is what I found.
    - Coca-Cola: 24 pk
      - Meijer: $7.99
      - Walmart: $7.99
      - Kroger: $7.99
      - Target: $8.99

- Ask Thrifty
  - mPerks
  - Help
Team Meijer
Alpha Presentation
Team Meijer
Alpha Presentation

Home Screen
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 _____?

Ask Thrifty

These are some of the FAQs. 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
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
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

- Mobile Student Client
- Sockets
- Instructor Web Client
- Estimote Beacons
- ID
- API Gateway
- Elastic Beanstalk
- EC2
- RDS
- SNS
- Amazon Web Services
Team Michigan State University
Project Plan Presentation

Screen Mockup: Forums - Web
Team Michigan State University
Alpha Presentation

See VB Module UTL_PresentationSlidesSend2FB.
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(1)
- O(log N)
- O(N^2)

SUBMIT
Team Michigan State University
Alpha Presentation
The Capstone Experience

Team Mozilla

Department of Computer Science and Engineering
Michigan State University
Spring 2018
Firefox
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](https://www.mozilla.org/en-US/firefox/download/new/)

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
Project Overview

Project Overview
Team Mozilla

Mountain View, California
Team Mozilla
Vivek Dhingra, Connor Masini, Dyl Stokes, Bogdan Pozderca, Zhengyi Lian
Team Mozilla
Project Plan Presentation

Screen Mockup: In-Product Page
Do not delete this textbox. It's used as a marker in VB code. See VB Module UTL_PresentationSlidesSend2FB.
Team Mozilla
Project Plan Presentation

Architecture Diagram

API

Firefox Theme

Chrome Theme
Team Mozilla
Project Plan Presentation
Team Mozilla
Project Plan Presentation

Screen Mockup: Menus

Is “too much internet” a real thing? We explore this idea by talking about what technology is doing to our bodies and brains in Mozilla's latest IRL podcast. Tune in to learn more.
Team Mozilla
Alpha Presentation

Auto-Complete Styling
Team Mozilla
Alpha Presentation

Popup Styling
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
Your morning coffee could win you $800.

Find Out More
Team MSUFCU
Project Overview

Digital Assistant and Personal Financial Coach

• Functionalities
  ▪ 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

Digital Assistant and Financial Coach
Login

Email or account number

Password

LOG IN

Settings  Account Info  Log out

How may I assist you today?

What is my account balance?

Your current account balance is $584.29.

Can I afford to buy a new TV right now?

Based on average new TV prices, and the fact that $400 will be withdrawn on January 31st for your rent, you won’t be able to afford a new TV.

How much do people my age spend on gas per month?

Send

How much do people my age spend on gas per month?

Send

How much do people my age spend on gas per month?

Send
Team MSUFCU
Project Plan Presentation
Project Plan Presentation

Architecture Diagram

Admin Portal

Middleware

MSUFCU SQLite Database

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

Team MSUFCU
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.

6000.
Team MSUFCU
Alpha Presentation

Android App

MSUFCU Chatbot

Thanks! You are now logged in.

Which expense would you like to add?

How much is your new expense?

Successfully added expense.
Team MSUFCU
Alpha Presentation

Facebook Messenger

Which share would you like to transfer to?

How much would you like to transfer?

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
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)
    - Ingest by Photo or PDF
    - Determine Keywords via OCR
    - Search via Text and Voice
    - Display Like E-Book
  - Provide Companion Administrative App
  - Implement Chatbot on Corporate Website
    - Product Inventory
    - Available QRCs
    - 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

Quick Reference Guide Viewer

Search for QRG ...

advanced QRG search

Hello, Amanda

Add QRG

VERIFONE VX 680
XEVA440
RETAIL

First Data FD130
750FD130
RETAIL

VERIFONE VX 520
XEVA440
RESTAURANT

showing top viewed
Team Phoenix Group
Project Plan Presentation
Team Phoenix Group
Project Plan Presentation

Architecture Diagram

Chatbot

Microsoft Bot Framework

LUIS NLP

MongoDB Server

MongoDB Driver

Desktop

Windows ASR

Windows App

Windows OCR

Tablet
Team Phoenix Group
Project Plan Presentation
Team Phoenix Group
Project Plan Presentation

Screen Mockup: QRG Edit Screen

Quick Reference Guide Viewer

- Save

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

Quick Reference Guide Viewer

- Manufacturer: VERIFONE
- Terminal Type: VX620
- Application Type: RETAIL
- Product Number: 0300011
- Version: XEUA431

The Capstone Experience
Team Phoenix Group
Alpha Presentation
Team Phoenix Group
Alpha Presentation

Customer Service Chatbot
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
    ▪ Provide Drill Down Capability
    ▪ 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
- Cluster Logic
- Malware Analysis System
- Dynamic Decision Logic
- Signature Information Aggregator
- Malware Sandbox
- SQLite
- Database Server
- Postman API
- Web Server
- Bootstrap Javascript Framework
Team Proofpoint
Project Plan Presentation
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>
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<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>
Team Proofpoint
Alpha Presentation

In Depth Analysis of a File

In-Depth Analysis of 6BDE693CE8EB45445C0B38E3DE3AF97E0D21C8D33E8408B52E711EA67ABFD27

File Statistics and Information

<table>
<thead>
<tr>
<th>File Information</th>
<th>Statistic Information</th>
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</thead>
<tbody>
<tr>
<td>File Extension</td>
<td>PE32+ executable (console) x86-64, for MS Windows</td>
</tr>
<tr>
<td>File Size</td>
<td>333,0 KB (3,307,52 bytes)</td>
</tr>
<tr>
<td>Total Analysis Time</td>
<td>00:00:00:296</td>
</tr>
<tr>
<td>Static Analysis Time</td>
<td>00:00:00:296</td>
</tr>
<tr>
<td>Dynamic Analysis Time</td>
<td>00:00:00</td>
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</table>

File Hashes

<table>
<thead>
<tr>
<th>Hash Types</th>
<th>File Hash</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE Hash</td>
<td>3:NIKOgKXFEU/3:POQ8Lw/cKQ417fT2e/H4JSV1H5D9/sKvKLz+iWQ/yW5K/N7/P7N/EV:14bP5F123</td>
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<tr>
<td>SHA256</td>
<td>6BDE693CE8EB45445C0B38E3DE3AF97E0D21C8D33E8408B52E711EA67ABFD27</td>
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<tr>
<td>SHA1</td>
<td>820F5F/PC4897/392DE434M1/T609/C29A88B740K6V</td>
</tr>
<tr>
<td>MD5</td>
<td>06C8062A8609A430F19ECC06E3C3B3</td>
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</table>

Similar Malware

<table>
<thead>
<tr>
<th>File Name</th>
<th>PE Hash</th>
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<tr>
<td>3:NIKOgKXFEU/3:POQ8Lw/cKQ417fT2e/H4JSV1H5D9/sKvKLz+iWQ/yW5K/N7/P7N/EV:14bP5F123</td>
<td>3:NIKOgKXFEU/3:POQ8Lw/cKQ417fT2e/H4JSV1H5D9/sKvKLz+iWQ/yW5K/N7/P7N/EV:14bP5F123</td>
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<td>3:NIKOgKXFEU/3:POQ8Lw/cKQ417fT2e/H4JSV1H5D9/sKvKLz+iWQ/yW5K/N7/P7N/EV:14bP5F123</td>
</tr>
<tr>
<td>695C7B2E9F73B88F736C7B0869/3D01C843CF3778CA983F9773710427178</td>
<td>3:NIKOgKXFEU/3:POQ8Lw/cKQ417fT2e/H4JSV1H5D9/sKvKLz+iWQ/yW5K/N7/P7N/EV:14bP5F123</td>
</tr>
</tbody>
</table>
Team Proofpoint
Alpha Presentation
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
Team Quicken Loans
Project Overview

Fundamenta: Trust in New Home Construction

• Functionalities
  ▪ Enable Collaborative New Home Construction
  ▪ Include All Players

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

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

REST API

SQL Server

SQL Database

Azure
Team Quicken Loans Project Plan Presentation
Screen Mockup: Build Workflow

Team Quicken Loans
Project Plan Presentation

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!

Leave a comment...

Submit
Team Quicken Loans
Alpha Presentation

Sign Up
Team Quicken Loans
Alpha Presentation

Dashboard
Team Quicken Loans
Alpha Presentation

Build Status
The Capstone Experience

Team Rook

Department of Computer Science and Engineering
Michigan State University
Spring 2018
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
Team Rook
Project Plan Presentation
Team Rook
Project Plan Presentation

Architecture Diagram

- React JS
- Elasticsearch
- Lambda
- S3
- S3 API
- REST API
- Django
- Agents
- Local Storage
Team Rook
Project Plan Presentation
Team Rook
Project Plan Presentation

Screen Mockup: Configuration

Agent Dashboard

Configure Agent

System Health

Agent Version: 1.02.07

Add Path:
Path 9

Remove Path

Current Paths:
- Path 1
- Path 2
- Path 3
- Path 4
- Path 5
- Path 6
- Path 7
- Path 8

Custom Data Storage Location:
- Amazon S3 Bucket

Current Storage Location: Amazon S3 Bucket
Team Rook
Alpha Presentation
Team Rook
Alpha Presentation

Force Platform
Team Rook
Alpha Presentation

Force Platform
Team Rook
Alpha Presentation
Team Rook
Alpha Presentation

Storage System

---

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<td>testAuthentication_2019-02-01T19:41:44+00:00.gz</td>
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<td>5420 bytes</td>
<td>Standard</td>
</tr>
</tbody>
</table>
The Capstone Experience

Team SpartanNash

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

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
- Username
- Name
- Feed

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

Architecture Diagram

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
See VB Module UTL_PresentationSlidesSend2FB.
Team SpartanNash
Alpha Presentation

Volunteer Tracking Form

Volunteer Hour Form

Organization Name

Volunteer Activity or Event Name

Area of Support

Commitment Type

Date Start of Event

Length of Volunteer Time (hours)

Please Describe Your Experience

Submit
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
    o Create and Print Waypoints
    o Configure and Improve Routes
    o 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
Project Plan Presentation

Screen Mockup: Android App
Team Spectrum Health
Project Plan Presentation
Team Spectrum Health
Project Plan Presentation

Architecture Diagram

Web Application
- ASP.NET
  - REST API

SQL Database

iOS Application
- ALAMOFIRE

Android
- Retrofit
Do not delete this textbox. It's used as a marker in VB code. See VB Module UTL_PresentationSlidesSend2FB.

Team Spectrum Health Project Plan Presentation
Team Spectrum Health
Project Plan Presentation

Screen Mockup: Web App

SPECTRUM HEALTH

SpectrumGO LOBBY Waypoint

Paths

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

To Nursing Ward
Update

To Cardiology
Directions: Turn around. Take the first Angle: 180
Update

To Pharmacy
Directions: Take the staircase on your Angle: 45
Add  Delete
Team Spectrum Health Alpha Presentation
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

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
The Capstone Experience

Team Symantec
Project Overview

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
    - Number of authentications per time unit
    - Successful vs failed authentications
    - Unique users per time unit
    - Distribution of risk reasons
  - Create Security Dashboard and Alerting
    - Trends of failed authentications
    - Find risky users
    - 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

Mountain View, California
Team Symantec
Project Plan Presentation

Screen Mockup: Dashboard in Splunk
Team Symantec
Project Plan Presentation

Architecture Diagram

- Two-factor authentication
- Data & Event Logs
- Symantec VIP services
- VIP Reporting Client
-Splunk
- ELK
- AWS

Powered by Symantec

Customers

Internet

Powered by MSU Team Symantec
Screen Mockup: Dashboard in ELK
Team Symantec
Alpha Presentation

Splunk Dashboard
Team Symantec
Alpha Presentation

ELK Dashboard

Dashboard / Operational Dashboard

Record Count: 6,226
Number of Users: 477

Authentication Status

Users Created Over Time

Uses Lucene query syntax
Team Symantec Alpha Presentation
The Capstone Experience

Team Symantec

Alpha Presentation

ELK Alerting on Slack

You created this channel today. This is the very beginning of the #general channel. Purpose: This channel is for workspace-wide communication and announcements. All members are in this channel. (edit)

- Add an app
- Invite others to this channel

Today

- Abby Urbanski 7:13 PM
  joined #general.
- Abby Urbanski 7:21 PM
  added an integration to this channel: ELK Alert

Watcher 7:52 PM
  Watch [Spike Alert] has exceeded the threshold
  Watch [Spike Alert] has exceeded the threshold
  Watch [Spike Alert] has exceeded the threshold
  Watch [Spike Alert] has exceeded the threshold
  Watch [Spike Alert] has exceeded the threshold

Watcher 8:00 PM
  Watch [Spike Alert] has exceeded the threshold
  Watch [Spike Alert] has exceeded the threshold
  Watch [Spike Alert] has exceeded the threshold
  Watch [Spike Alert] has exceeded the threshold
  Watch [Spike Alert] has exceeded the threshold

Watcher 8:03 PM
  Watch [Spike Alert] has exceeded the threshold
  Watch [Spike Alert] has exceeded the threshold
  Watch [Spike Alert] has exceeded the threshold
  Watch [Spike Alert] has exceeded the threshold
  Watch [Spike Alert] has exceeded the threshold

new messages

Message #general
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
Team TechSmith
Project Overview

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
    o TechSmith Video Review
    o Wistia
    o 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

Okemos, Michigan
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

- Snagit
- Camtasia
  TechSmith Desktop Applications
  TechSmith Extensibility Framework
  Test Harness
  Windows Desktop

- WISTIA
- TechSmith Video Review
- imgur
  Media Hosting APIs
Team TechSmith
Project Plan Presentation
Team TechSmith
Project Plan Presentation

Screen Mockup: Test Harness

Choose File ...

Output To:

- TechSmith Video Review
- Wistia
- Imgur

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

SnagIt Share Menu
Team TechSmith
Alpha Presentation

TechSmith Video Review

TechSmith Video Review Output Options

- TechSmith Account: Logged in as example@gmail.com
- Learn more about TechSmith Accounts.

TechSmith Video Review

Title: test
Review-by Date: 2/28/2018
Reviewer Prompt: Would love some feedback on the colors

Upload Cancel
See VB Module UTL_PresentationSlidesSend2FB.

Team TechSmith
Alpha Presentation
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
    o Responsive Design
    o Support Apple iOS and Google Android Devices
  ▪ Manage Users
    o Register
    o Identify
    o De-Activate
  ▪ Support All Major Voice Interfaces
    o Amazon Echo
    o Google Home
    o Apple Siri
    o 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
Team Union Pacific
Project Plan Presentation
Team Union Pacific
Project Plan Presentation

Architecture Diagram

- User Preferences
- Train Lineup
- Employee Authentication
- Employee Queue
- Company Database

JavaScript

- JavaScript webpage

Assistants

The Capstone Experience
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.
Do not delete this textbox. It's used as a marker in VB code.

See VB Module UTL_PresentationSlidesSend2FB.

Team Union Pacific Alpha Presentation
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 9:00 a.m.; Train PIP987, departure time 10:00 a.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 9:00 a.m.; Train PIP987, departure time 10:00 a.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
Team Union Pacific
Alpha Presentation

Web App Reporting Page

The Capstone Experience
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
    - Up, Down, Lock
    - Lock, Standby
  - Provide Voice Control
    - Safe Word for Home/Reset Position
    - 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

Level
Standby
Voice
Lock
Raise
Lower

The Capstone Experience
Team Urban Science
Project Plan Presentation
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
Team Urban Science
Alpha Presentation

Up and Lock Active
Team Urban Science
Alpha Presentation

Setting Page
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
Team USAA
Project Overview

LIMElight: Life Insurance Made Easy

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

• Features
  ▪ Provide Smooth User Experience
    o Responsive Web
    o Native Apple iOS and Google Android Apps
  ▪ Generate Personalized Quote
    o Use Minimal Inputs from Applicant
    o Leverage Machine Learning
    o Match Underwritten Premium Closely
  ▪ Create Health Record Blockchain
    o Controlled by Applicant
    o Ensure Privacy and Security
    o 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
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>N</td>
</tr>
</tbody>
</table>

Update
Team USAA
Alpha Presentation
Get a Life Insurance Quote

How old are you?
20

Height (in rounded feet)
6

Height (in rounded inches)
2

Are you married?
- Single
- Married

What is your gender?
- Female
- Male

Do you travel internationally??
- Yes
- No

Have you earned a bachelor’s degree?
- Yes
- No
Welcome Bob Jones
Your Authorized Practitioners
Authorize A Practitioner

Your Authorized Practitioners

Authorize A Practitioner
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
Humanize
The Candidate Experience

Provide unprecedented speed and transparency throughout the candidate journey.
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
Team Yello
Jonathon Zeitler, Leo Yao, Jenn Proos, Quan Zhou, Brian Wang
Team Yello
Project Plan Presentation

Screen Mockup: Staff Management Page

Create New Interview

Manage Interviews

Schedule a live interview

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

Next Question
Team Yello
Alpha Presentation

Candidate Video Response

Facebook Web Designer

Question 2

Describe a situation where you had to work in a team that didn’t get on very well. What happened? What did you do and what role did you take? How did the situation evolve?
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.
Do not delete this textbox. It's used as a marker in VB code.

See VB Module UTL_PresentationSlidesSend2FB.

Team Yello
Alpha Presentation
Senior Test Engineer

We are looking for a quality assurance engineer to build out a set of modern test automation suites for Ruby and Java applications.

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

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
TechSmith Screencast Award
Team Amazon, Spring 2017
ACRA: Amazon Customer Review Analyzer
Jie Wan, Jason Liu, Ian Whalen, Ankit Luthra, Tess Huelskamp
Presented by Wendy Hamilton of TechSmith
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
Auto-Owners
INSURANCE
LIFE • HOME • CAR • BUSINESS
Michigan State University
Federal Credit Union
Building Dreams Together