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
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**

**Project Plan Presentation**

Screen Mockup: Malware Search

---

### Malware Sample Search

<table>
<thead>
<tr>
<th>Sample</th>
<th>Type</th>
<th>ID</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample ID</td>
<td>Custom</td>
<td>000000</td>
<td>14</td>
</tr>
<tr>
<td>Strong Password</td>
<td>Custom</td>
<td>000000</td>
<td>0</td>
</tr>
<tr>
<td>File Test</td>
<td>Custom</td>
<td>000000</td>
<td></td>
</tr>
<tr>
<td>Slack Install</td>
<td>Custom</td>
<td>000000</td>
<td>1</td>
</tr>
<tr>
<td>Custom Foo</td>
<td>Custom</td>
<td>000000</td>
<td>32</td>
</tr>
<tr>
<td>api-manual</td>
<td>Patch</td>
<td>000000</td>
<td>22</td>
</tr>
</tbody>
</table>

---

- **File Name:** `040d71e56512ao786bcs.xls`
- **File Size:** 77824 bytes
- **File Mime:** `application/vnd.ms-excel`
- **File Type:** Composite Document File V2 Document
- **MD5:** `040d71e56512ao786b`
- **SHA1:** `a4jn43kn34mk34mk343mk3443mk`
- **First Seen:** `2014-07-10 22:39:21`
- **Last Seen:** `2014-07-10 22:39:21`
- **Notes:**

---

The Capstone Experience
Team Accenture Project Plan Presentation
Team Accenture
Project Plan Presentation

AMAP Modules

Data Server

Malware Database

iDefense
Part of Accenture Security

AMAP Dashboard

python

mongoDB

django

html

javascript

css

amazon 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

Module Selection Page
Team Accenture
Alpha Presentation
Team Accenture Beta Presentation
Team Accenture
Beta Presentation

AMAP Wizard
Team Accenture
Beta Presentation

BetaPresentationSlideTitle
Team Accenture
Beta Presentation

AMAP Dashboard

Dashboard (1 new update)

File Upload

Processes

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

9:00AM, 10:00AM, 11:00AM, 12:00PM, 1:00PM, 2:00PM
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
Zach Whitener, Hansheng Zhao, Dillon Stock, Cam Korzecke, Chess Luo
Team Amazon
Project Plan Presentation

Screen Mockup: Web App Dashboard
Team Amazon Project Plan Presentation
Team Amazon
Project Plan Presentation
Team Amazon
Project Plan Presentation

Screen Mockup: Podcast Details Page

Project Plan Presentation

Screen Mockup: Podcast Details Page

Team Amazon
Project Plan Presentation
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
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
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
Project Plan Presentation

Architecture Diagram

Internal Network

- Internal Server
- SQL Database Server
- Application Server
  - .NET Web Application
- Active Directory

- APTIV -

- Admin
- Product Engineer
- Cybersecurity

Protecode SC
Team Aptiv
Project Plan Presentation

Screen Mockup: Vulnerability Assessment
Team Aptiv
Alpha Presentation
Team Aptiv
Alpha Presentation

Dashboard
Team Aptiv
Alpha Presentation

Product Dashboard
Team Aptiv
Alpha Presentation
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
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

Photos

Housing
List of each category

"The Smith Home" 324 Maple Street
Edit - Paragraph

Anyone Home 1
Read only - Paragraph

Anyone Home 2
Read only - Paragraph

ADD TO LIST

Underwriting Support: 1-800-239-2934 | Technical Support: 1-800-346-0346 x1850

The information gathered will be used for the sole purpose of providing an insurance rate proposal. Rates are subject to change based on company rate schedules and/or changes to any of the required rating information.

Live Support
Feedback & Comments
Terms of Use and Private Policy

Underwriting, Feb. 2016: Effective dates are used. May be used in a space and are not for full time occupants. That could affect the exposure on the policy. Refer to the agent for confirmation.

"The Smith Home" 324 Maple Street

<table>
<thead>
<tr>
<th>Sample Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>OBJECT</td>
</tr>
<tr>
<td>Sink</td>
</tr>
<tr>
<td>Toilet</td>
</tr>
<tr>
<td>Shower/Tub</td>
</tr>
<tr>
<td>Sink</td>
</tr>
<tr>
<td>Toilet</td>
</tr>
<tr>
<td>Bed</td>
</tr>
<tr>
<td>Bed</td>
</tr>
<tr>
<td>Bed</td>
</tr>
<tr>
<td>Table</td>
</tr>
<tr>
<td>Couch</td>
</tr>
</tbody>
</table>

ADD TO LIST
Screen Mockup: VR User Interface
Team Auto-Owners
Project Plan Presentation

Architecture Diagram

Server-Side Applications
- Object Recognition System
  - Select environment and edit object data
  - Submits Environment Images for Object Identification
  - Creates Object Listings in Object Database
- User System
  - Manages User Data, Updates Data, Retrieves Data, Creates Data
- Database

Client-Side Applications
- VR Application
  - 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

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

Displays panoramic view of uploaded environment and object info
Provides user's visual orientation and microphone input
Allows user to interact with UI and select available objects
User uploads omnidirectional images to web portal
Team Auto-Owners
Project Plan Presentation
Team Auto-Owners
Project Plan Presentation

Screen Mockup: VR User Interface
Do not delete this textbox. It's used as a marker in VB code. See VB Module UTL_PresentationSlidesSend2FB.
Team Auto-Owners
Alpha Presentation

Web: Inventory List

![Inventory View](image-url)

**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>3</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
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
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.dowdupont.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

Architecture Diagram

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

3D Design Tools

Hardware
- VR
- VRTK

Virtual Reality Tools

Language
- SDK

Software Development Kit

Assets
- Steam VR

Virtual Reality Platform

The Capstone Experience
Do not delete this textbox.

It's used as a marker in VB code.

See VB Module UTL_PresentationSlidesSend2FB.

Team Dow

Project Plan Presentation
Team Dow
Project Plan Presentation

Screen Mockup: The Railcar
Team Dow
Alpha Presentation
Team Dow
Alpha Presentation

Load Arm and Spreader
Do not delete this textbox. It's used as a marker in VB code.

See VB Module UTL_PresentationSlidesSend2FB.

Team Dow Alpha Presentation
Team Dow
Beta Presentation

Load Arm and Spreader
Do not delete this textbox.

It's used as a marker in VB code.

See VB Module UTL_PresentationSlidesSend2FB.

Team Dow Beta Presentation
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

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

Architecture Diagram

Tecnomatix

THE BOX

Particle

Stream

Cloud

Visualize

Applications

thingworx studio

Produce
Team DRIVEN-4
Project Plan Presentation
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
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
Your new vehicle is waiting

Shop our vehicles

Shop Chevrolet.com
Shop Buick.com
Shop GMC.com
Shop Cadillac.com
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
    ○ .NET / C#
    ○ Bot Framework
    ○ Language Understanding Intelligent Services (LUIS)
    ○ Team Foundation Server
    ○ Teams / O365
    ○ 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
Team GM
Project Plan Presentation

Screen Mockup: Web Dashboard

Diagram:
- Microsoft Azure
- Microsoft Azure
- Visual Studio
- Azure Bot Service
- .NET Framework
- Microsoft Teams
Team GM
Alpha Presentation
Team GM
Alpha Presentation

VM Creation Through Bot
Team GM
Alpha Presentation

Virtual Machines Dashboard
Team GM
Alpha Presentation
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
    □ 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

Screen Mockup: Identifying Chair
Team Herman Miller
Project Plan Presentation

Architecture Diagram

- 3D assets
- Model Target Generator
  - Vuforia matches model target to camera input
  - Vuforia
  - Unity displays appropriate interactive 3D model
  - Unity
- Camera Input
- iOS
  - Builds
  - Xcode
- Android
  - Builds

The Capstone Experience
Team Herman Miller
Project Plan Presentation
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

Interactive Model
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 up the front handles on the right and left sides to disengage the lacking 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
Team Herman Miller
Alpha Presentation

Main Menu
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 over
Team Meijer
Project Overview

Thrifty: Personal Shopping Assistant

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

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

• Technologies
  ▪ Microsoft
    ○ .NET Framework (C# / ASP.NET)
    ○ Bot Framework
    ○ Language Understanding Intelligent Service (LUIS)
    ○ Azure
    ○ Application Insights
    ○ Visual Studio
  ▪ Xamarin
  ▪ Meijer Web Services
  ▪ SQL Server / MongoDB

Grand Rapids, Michigan
Team Meijer
Emerson Chen, Zach Richardson, Megan Lippert, Jacob Bonesteel, Aaron Carlso
Team Meijer
Project Plan Presentation

Architecture Diagram

- iOS
- Apple Speech
- Android
- Google Speech

Bot Framework

Azure
- mperks
- SQL
- Competitor Pricing

LUIS

BLUEBIRD
Team Meijer
Project Plan Presentation

Screen Mockup: Functionality
Team Meijer
Alpha Presentation
Team Meijer
Alpha Presentation

Home Screen

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
Team Meijer
Alpha Presentation

The following 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 ___?

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

LOCATION
Team Meijer
Alpha Presentation
Team Meijer
Alpha Presentation

Product Page and Conversations
Team Meijer
Beta Presentation

Chat Interface
Team Meijer
Beta Presentation

Product Page

Ice Cream Cake Roll, Oreo, 32 fl oz
$9.99
Aisle 28

Click Here if the Item is Out of Stock
Check if Coupon Available
Check Competitor Prices

Related Products

Ask Thrifty

Diet Coke Caffeine Free - 8/12 oz Bottles
$4.59
Aisle 3

Coupons Available
Competitor Prices
Product Out of Stock, Notify Store

Related Products:
Team Meijer Beta Presentation
Team Meijer
Beta Presentation

mPerks
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
Team Michigan State University Project Plan Presentation
Team Michigan State University
Project Plan Presentation

Screen Mockup: Forums - Web
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(LOGN)
- O(N^2)

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

- $O(n)$
- Constant
- $O(n^2)$
- $O(\log N)$

![Bar Chart](chart.png)

**Legend:**

- A
- B
- C
- D

**Question:**

Which of the following represents the correct time complexity for the given algorithm?

- $O(n)$
- Constant
- $O(n^2)$
- $O(\log N)$
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
Team Mozilla
Project Overview

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

Screen Mockup: Menus
Team Mozilla
Alpha Presentation

Auto-Complete Styling
Team Mozilla
Alpha Presentation

Popup Styling
Find Bar and Menu Styling

Team Mozilla
Alpha Presentation
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
Do not delete this textbox. It's used as a marker in VB code.

See VB Module UTL_PresentationSlidesSend2FB.
Team MSUFCU
Project Plan Presentation

Architecture Diagram

Admin Portal

Middleware

MSUFCU SQLite Database

iOS App, Android App, Amazon Alexa, Facebook Messenger, and iMessage
Team MSUFCU
Project Plan Presentation
Team MSUFCU
Project Plan Presentation

Screen Mockup: Web Admin Portal

Account Info | Resources | About
System Architecture

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.

6000.

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

Android App

MSUFCU Chatbot

Avengers

MSUFCU Chatbot

Thanks! You are now logged in.

add expense

MSUFCU Chatbot

Which expense would you like to add?

rent

MSUFCU Chatbot

How much is your new expense?

120

MSUFCU Chatbot

Successfully added expense.

Enter message
Team MSUFCU
Alpha Presentation

Facebook Messenger
Team MSUFCU
Beta Presentation

Android and iOS Chatbots

MSUFCU Chatbot
Hello Beverly Crusher! How can I help you today?

what do people like me spend on groceries?

Edgar
Would you filter by age or income, Beverly?

Members in your income demographic spent an average of $613.34 last month on Groceries, Beverly. Is there anything else I can help you with?

Hello Kathryn Janeway! How can I help you today?

Can I afford to buy a laptop

A 'laptop' costs about $539.99 according to Google Shopping. You should probably not be spending $539.99 anytime soon, Kathryn.
I see you spent $124.62 at RadioShack, Taco Bell, Toys ‘R Us a number of times last month, Elim. You could save $18.69 if you cut back just 15% over the next month and $224.28 if you continue this trend over the next year! Would you like me to help you implement this savings plan?
Welcome, Kathryn. How may I help you?

Alexa, transfer $500 from my checking account to another checking account.

6000.

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

Please say your Alexa PIN to confirm this transaction of $500 to account 6000.
The Capstone Experience

Team Phoenix Group

Department of Computer Science and Engineering
Michigan State University
Spring 2018
WELCOME TO
THE PHOENIX GROUP
RISING TO NEW LEVELS IN POS DEPLOYMENT

BROWSE PRODUCTS
OUR SERVICES
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)
    - 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
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

Windows ASR
Windows App

Desktop
Tablet

Windows OCR
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
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
    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

Flagged Files
TMP1CE2.TMP
Memo.pdf
DriverPack.exe
Virus.exe
NotSpyware.jar

Batch Information
Files Processed: 103/250
Time Elapsed: 00:15:23
Flagged Files: 15
Team Proofpoint Project Plan Presentation
Team Proofpoint
Project Plan Presentation

Architecture Diagram

Malware → PE Hash → Dynamic Decision Logic → Signature Information Aggregator → Malware Sandbox

Static Malware Detection Tools

Cluster Logic

SQLite → Database Server

Postman API

Web Server

Bootstrap Javascript Framework

Cuckoo

The Capstone Experience
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>C6A13AF583109680CCB54FBB2B3D14E4BA06E9C7A363C884B13B3C5E81FAA</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 6BDE693CE8EB45445C0B38E3DE3AF97E0D21C8D33E8408B52E711EA67ABFD27

#### File Statistics and Information

<table>
<thead>
<tr>
<th>Statistic Information</th>
<th>File Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extension</td>
<td>PE32+ executable (console) x86-64, for 32-bit Windows</td>
</tr>
<tr>
<td>Size</td>
<td>330.8 KB (330752 bytes)</td>
</tr>
<tr>
<td>Total Analysis Time</td>
<td>00:00:02.96s</td>
</tr>
<tr>
<td>Static Analysis Time</td>
<td>00:00:02.96s</td>
</tr>
<tr>
<td>Dynamic Analysis Time</td>
<td>00:00:00</td>
</tr>
</tbody>
</table>

#### File Hashes

<table>
<thead>
<tr>
<th>Hash Types</th>
<th>File Hash</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE</td>
<td>3NNK3y90TEU3b0KhUz2Qg6RAQnVW8Wb1q6q3BYR+yAg7vY49721E7786b29R451q89MB+yf</td>
</tr>
<tr>
<td>SHA256</td>
<td>6BDE693CE8EB45445C0B38E3DE3AF97E0D21C8D33E8408B52E711EA67ABFD274</td>
</tr>
<tr>
<td>SHA1</td>
<td>820DF5FPC049B7319D26436ETD9C2948874D0676</td>
</tr>
<tr>
<td>MD5</td>
<td>8DC8662A6B09A43F9F89EC06EEEEE3CBB3D</td>
</tr>
</tbody>
</table>

#### Similar Malware

<table>
<thead>
<tr>
<th>PE Hash</th>
</tr>
</thead>
<tbody>
<tr>
<td>3NNK3y90TEU3b0KhUz2Qg6RAQnVW8Wb1q6q3BYR+yAg7vY49721E7786b29R451q89MB+yf</td>
</tr>
<tr>
<td>4E3D223ED5C3DAE5E5259A3AB667972023CF3935F627423827E9B3E64</td>
</tr>
<tr>
<td>695C7B02ED97388587337CBA5D43C8773A9F937734072178</td>
</tr>
<tr>
<td>695C7B02ED97388587337CBA5D43C8773A9F937734072178</td>
</tr>
</tbody>
</table>

---

The Capstone Experience
Team Proofpoint
Alpha Presentation

Cuckoo Webpage

Network Analysis

Hosts

DNS

TCP

UDP

GET → 200 http://www.msftncsi.com/ncsi.txt

Request:
- GET /ncsi.txt HTTP/1.1
- Connection: Close
- User-Agent: Microsoft NCST
- Host: www.msftncsi.com

Body:
- Request: request
- Response: response
- Plaintext
- Hex
- 16 bytes
- 32 bytes
- 48 bytes
- 64 bytes

Body content: 4665 6d72 6f73 6f6e 7420 4663 5353
Team Proofpoint Beta Presentation
Team Proofpoint
Beta Presentation

Top 25 Yara Rules Matched Graph
Team Proofpoint
Beta Presentation
Signature Generation Page
The Capstone Experience

Team Quicken Loans

Department of Computer Science and Engineering
Michigan State University
Spring 2018
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
    - 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
Alpha Presentation

Sign Up
Team Quicken Loans
Alpha Presentation

Dashboard

The Capstone Experience
Team Quicken Loans
Alpha Presentation

Build Status

The Capstone Experience
Team Quicken Loans Beta Presentation
Team Quicken Loans
Beta Presentation

Dashboard
Team Quicken Loans
Beta Presentation

Progress
Team Quicken Loans
Beta Presentation
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
    ▪ Enable Remote Agent Configuration
    ▪ Do Health Checks and Data Analysis
    ▪ Display Health Check Information
    ▪ Create Alert Thresholds
  ▪ Store Metrics and Log Files
    ▪ RESTful Endpoint
    ▪ Amazon Simple Storage Service (S3)
    ▪ 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
Team Rook
Project Plan Presentation

Screen Mockup: Configuration
Team Rook
Alpha Presentation

Force Platform
Team Rook
Alpha Presentation
Team Rook
Alpha Presentation
Team Rook
Alpha Presentation

Storage System
Team Rook
Beta Presentation

Agent Management Console
Team Rook
Beta Presentation

Agent Configuration Tab
Team Rook
Beta Presentation
Team Rook
Beta Presentation
Windows Agent Product Validator

ROOK Agent System

Step 1: Please Choose your Operation System
- Unix
- Windows

Step 2: Please Input your Key
Key: [___]

Step 3: Click “Submit” button to verify your ClientKey

Welcome to ROOK Agent
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

Grand Rapids, Michigan
Team SpartanNash
Tianyi Li, Aleks Bonev, Abbott Wang, Denis Andreev, Nino Candela
System Architecture

Mobile Applications
- React Native
- Android App
- iOS App

Websites
- HTML, CSS
- Web Form
- Access Bank

Team SpartanNash Project Plan Presentation
Team SpartanNash
Project Plan Presentation

Screen Mockup

Sign In

Username

Password

Remember your Password?

Forgot your Password?

Recover

Volunteer Form

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

Volunteer Hour Form

- Organization Name
- Volunteer Activity or Event Name
- Area of Support: Advocacy
- Commitment Type: One Time
- 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
The Capstone Experience

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

Spectrum Health Go

Grand Rapids, Michigan
Team Spectrum Health
Project Plan Presentation

Screen Mockup: Android App

- Go Upstairs
- Walk Down East Hall

From... East Wing Stairwell
To... Main Lobby

From... Main Lobby
To... Room C114

Waypoint Recognized!
Updating location to:
Main Lobby
Team Spectrum Health
Project Plan Presentation

Architecture Diagram

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

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
Update

Add Delete
Team Spectrum Health
Alpha Presentation

iOS Application
Team Spectrum Health
Alpha Presentation

Android Application

Select a Facility

Enter A Destination

Spectrum GO

Scan Your Current Waypoint
Team Spectrum Health Beta Presentation
Team Spectrum Health

Beta Presentation

iOS Application
Team Spectrum Health
Beta Presentation
Team Spectrum Health
Beta 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
    - 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
Team Symantec
Robert Novak, Abby Urbanski, Stephen Alfa, Keerthana Kolisetty, Echo Wu
Screen Mockup: Dashboard in Splunk

Authentications Across Different Device Types

Total Number of Authentications

Success vs. Failure Authentications

Number of Authentications Over Last Seven Days

Success vs Fall Attempts For Each Device Type
Team Symantec
Project Plan Presentation
Team Symantec
Project Plan Presentation
Team Symantec
Project Plan Presentation

Screen Mockup: Dashboard in ELK
Team Symantec
Alpha Presentation
Team Symantec
Alpha Presentation

Splunk Dashboard

Operational Trends

- Total Number of authentications: 9,079
- Total number of users: 500

Authentication Status

Users Created Over Time

Authentications over time

© 2004-2015 Splunk Inc. All rights reserved.
6,226
Record Count

477
Number of Users
Team Symantec
Alpha Presentation

ELK Alerting on Slack
Team Symantec Beta Presentation
Team Symantec
Beta Presentation

Splunk: Operation Trends Dashboard
Team Symantec
Beta Presentation
Splunk: Geolocation Dashboard
Team Symantec
Beta Presentation
ELK: Operational User Analysis Dashboard

Dashboard / Operational User Analysis

Users Created Over Time

Unique Users Authenticated

2,166
Users

Number of Users Created

128
Users Created

Top Authenticating Users

<table>
<thead>
<tr>
<th>Users</th>
<th>Number of Authentications</th>
</tr>
</thead>
<tbody>
<tr>
<td>spiker</td>
<td>350</td>
</tr>
<tr>
<td>GLUCS1</td>
<td>15</td>
</tr>
<tr>
<td>OUBO6R</td>
<td>15</td>
</tr>
<tr>
<td>6H9QRI</td>
<td>14</td>
</tr>
<tr>
<td>7S1LYA</td>
<td>14</td>
</tr>
<tr>
<td>F8UGGF</td>
<td>14</td>
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<td>407PLU</td>
<td>13</td>
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<tr>
<td>1BT7XF</td>
<td>12</td>
</tr>
<tr>
<td>AD24CH</td>
<td>12</td>
</tr>
<tr>
<td>777APX</td>
<td>11</td>
</tr>
</tbody>
</table>
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
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

Screen Mockup: Test Harness

Test Harness

Choose File ...

Output To:

TechSmith Video Review

Wistia

Imgur

XXX
Media
Thumbnail
XXX

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

SnagIt Share Menu
The Capstone Experience

Team TechSmith
Alpha Presentation

TechSmith Video Review
Team TechSmith
Alpha Presentation

Test Harness
Updated Imgur Options
Team TechSmith
Beta Presentation

Updated Wistia Options

Project: Wistia Beta Project
Created: Monday, February 25, 2018 5:08 PM
Updated: Sunday, April 1, 2018 10:38 PM
Media Count: 1
Name: Wistia Beta Project
Description: Storage for Wistia Beta media.
Team TechSmith
Beta Presentation
Team TechSmith
Beta Presentation

Beta 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
    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)
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Screen Mockup: Mobile Application

[Description of the mobile application screens]

- **Screen 1:** User authentication fields (ID, Password, Sign In)
- **Screen 2:** User settings (Union Pacific, PST, MSU)
- **Screen 3:** User settings (User Name, AM/PM, Military time)
Team Union Pacific
Project Plan Presentation
Team Union Pacific
Project Plan Presentation

Architecture Diagram

- User Preferences
- Train Lineup
- Company Database
- Employee Queue
- Employee Authentication
- JavaScript webpage
- Assistants
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.
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Alpha Presentation
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

Sure. Getting the test version of my test app.

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

Sure. Getting the test version of my test app.

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 Interaction

- 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.
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Web App Reporting Page

Welcome,
Default Role

Generate Report

Date Range: mm/dd/yyyy to mm/dd/yyyy

Assistant: [ ] Amazon Alexa [ ] Google Assistant

Queries: [ ] Train Lineup [ ] Position [ ] Settings [ ] Failed

User(s):

Generate Report

Breakdown by Query

- Request Position: 56%
- Request Train Lineup: 43%
- Change Settings: 0%
- Failed: 0%

Administration Controls

- Add User
- View Users
- View Roles
- Grant Permissions
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Beta Presentation

Request Train Lineup

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

Show me lineup 1234

Ok Jared, here is information for train lineup 1234. qwe456 at 09:00AM, abc123 at 12:00PM, pip987 at 01:00PM. Is there anything else I can help you with?

Change my time format to Military time

Ok Jared, your time format is now Military time.

Show me lineup 1234

Ok Jared, here is information for train lineup 1234. qwe456 at 09:00, abc123 at 12:00, pip987 at 13:00. Is there anything else I can help you with?
Team Union Pacific
Beta Presentation

The Capstone Experience
Team Union Pacific
Beta Presentation
Team Union Pacific
Beta Presentation

Web App Dashboard
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
- Supports
  - 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
- Home
- Settings
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
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Alpha Presentation

No Buttons Active
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
    - 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

LIMElight: Life Insurance Made Easy

- 11:30 Dr's Appt
- Get Life Insurance Quote
- Pick Kids Up From Practice
- Dinner Out
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

M ☑️ F
Age 37
Weight 180
Height 6' 1"
Do you smoke? Y ☑️ N
Do you exercise? ☑️ ☑️

GET A QUOTE
Team USAA
Project Plan Presentation

Architecture Diagram

Blockchain Backend (Azure)

REST API

Ethereum

Data

Execute Smart Contract

Execute Smart Contract

Machine Learning Backend (Azure)

REST API

Azure Functions

Machine Learning

Data

Result

Quote

User Input

Frontend Web Application (Azure)

React

Execute Smart Contract

• Get Health Record
• Modify Permissions
Team USAA
Project Plan Presentation
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?
30

Height (in nearest foot)
6

Height (in nearest inch)
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

Get a Quote
Team USAA
Alpha Presentation

Quote Result

Quoted Monthly Payment

$60/Month

Quote ID

89437

Next Steps
Contact USAA today with your Quote ID to get started
800-531-USAA
Welcome Bob Jones

Your ID: bob@gmail.com

Your Authorized Practitioners

dr.kelly@sparrow.org

Authorize A Practitioner

Here is a list of practitioners you may authorize

Dr. Ted Seuss

Authorize
From Students…
…to Professionals

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
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!
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Project Plan Presentation
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Project Plan Presentation

Architecture Diagram

- PostgreSQL Database
- HEROKU
- open-tok by tokbox
- Web Application
- Video Capture
- Video Analysis
- Analysis Results
- Server
- Azure
- Storage
- Video Indexer API
- Text Analytics API
- Emotion API
Team Yello
Project Plan Presentation

Screen Mockup: Interview Recording Page

Question 1
Talk about your self

Next Question
Team Yello
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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.
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?
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Beta Presentation
Question 1

Do you have a national ranking? If so, what is it?
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Beta Presentation
Team Yello
Beta Presentation
Team Yello
Beta Presentation

Analysis Results Page

Summary:
Emotion Score: 😊 Joy
Sentiment Score: 0.7 (Positive)
Sentiment Variation: 0.07

Question 1:
Are you excited about working here?

Transcript Sentiment:
0.88 (Positive)
Transcript:
I am so excited about the work at yellow I love learning day I love working on scale I love Elasticsearch playground I love Keith.

Emotion:
Top Emotion: 😊 Joy
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
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
yello