The Capstone Experience

Dr. Wayne Dyksen
Department of Computer Science and Engineering
Michigan State University
Fall 2015
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

• MW, 3:00-3:50pm, 2400 Engineering Building
• Presentations By
  ▪ Professor
  ▪ Teams
    o Status Reports
    o Formal Presentations
      ➢ Project Plan
      ➢ Alpha
      ➢ Beta
    o Project Videos
  ▪ Guest Speakers
All-Hands Meetings

09/02: Capstone Overview
09/07: (Labor Day, No Meeting)
09/09: Project Plan
09/14: Risks and Prototypes
09/16: Team Status Report Presentations
09/21: Team Project Plan Presentations
09/23: Schedule and Teamwork
09/28: Team Project Plan Presentations
09/30: Career Gallery
10/05: Team Project Plan Presentations
10/07: Team Project Plan Presentations
10/12: Resume Writing and Interviewing
10/14: Creating and Giving Presentations
10/19: Team Alpha Presentations
10/21: Team Alpha Presentations
10/26: Team Alpha Presentations
10/28: Team Alpha Presentations
11/02: Design Day and the Project Videos
11/04: Camtasia Demo
11/09: Team Beta Presentations
11/11: Team Beta Presentations
11/16: Team Status Reports
11/18: Team Status Reports
11/23: Team Beta Presentations
11/25: Team Beta Presentations
11/30: Team Beta Presentations
12/02: Team Beta Presentations
12/07: Project Videos
12/09: Project Videos and All Deliverables
12/10: Design Day Setup
12/11: Design Day
12/17: Project Videos
The Capstone Experience

Team Amazon

Department of Computer Science and Engineering
Michigan State University
Fall 2015
amazon
fireTV stick

Netflix, HBO GO, Amazon Instant Video, and more—just plug and play

$39

Movies Included with Prime Membership at No Additional Cost

Unlimited instant streaming of movies & TV shows
Team Amazon
Project Overview

Seller Forums Echo Companion

• Functionalities
  ▪ Amazon Echo Companion
  ▪ For Amazon Sellers
  ▪ To Interact with Amazon Seller Forums
  ▪ Hands-Free By Voice Using Alexa

• Features
  ▪ Support Sellers’ Hands-Free Ability To
    ▪ Ask and Submit Questions
    ▪ Submit Replies to Existing Threads
    ▪ Have Threads Read by Alexa
  ▪ Discover Intent by Creating Amazon Skill
  ▪ Create Endpoint Web Service Using AWS Lambda

• Technologies
  ▪ Amazon Web Services (AWS)
  ▪ AWS Lambda
  ▪ Amazon Echo and Alexa
  ▪ Java
Team Amazon
Marc Habermann, Patrick Williams, Jake Jensen, Archer Tang, Apoorv Singh
Team Amazon
Project Plan Presentation  Architecture Diagram

Echo receives voice commands or speaks a request; response.
Alexa matches speech to services.
Lambda function processes the request. Data gets pushed or pulled from the database.
Alexa, read the most recent post.

- What else can I do for you today?
- Alexa, mark that post as helpful.
- I have marked that post as helpful. What else can I do for you today?
- I would like to reply to the post...
Alexa, make a new post.

- Alexa prompts the user for each field.
- Alexa, <fill desired fields>.
- You have finished building a post, you can now review your post.
- Alexa, review my post.
- Alexa reads back post.
- Alexa, post it.
Alexa, what are my notifications?

- Alexa checks when you last accessed the Seller Forums.
- Alexa then gathers your notifications such as:
  - Markings on your questions
  - New replies to your question
Alexa, read the most recent post.

- The user “” said “”. What else can I do for you today?
- Alexa, mark that post as helpful.
- I have marked that post as helpful. What else can I do for you today?
- I would like to reply to the post...
posting a question

Alexa, make a new post.
- Alexa prompts the user for each field.
- *Alexa, <fill desired fields>.*
- You have finished building a post, you can now review your post.
- *Alexa, review my post.*
- Alexa reads back post.
- *Alexa, post it.*
Team Amazon
Beta Presentation
Alexa, what are my notifications.

- Alexa checks when you last accessed the Seller Forums.
- Alexa then gathers your notifications such as:
  - Markings on your questions
  - New replies to your question
Team Auto-Owners
Project Overview

HR Recruiting System

• Functionalities
  ▪ Simplify Job Application Process
  ▪ For Both Applicants and Auto-Owners
  ▪ Using Mobile, Tablet and Web Apps

• Features
  ▪ Support Multiple Input Methods
    o Text
    o LinkedIn
    o Resumes
    o Speech
  ▪ Manage Entire Application Workflow Process
    o From Assignment of Recruiter
    o To Sending of Offer or Decline Letter
  ▪ Handle Referrals by Existing Auto-Owners Associates
  ▪ Use Google Analytics

• Technologies
  ▪ Google Android Tablets and Phones / Java
  ▪ Apple iPads and iPhones (iOS) / Swift or Objective-C
  ▪ Web App Development
  ▪ Database Technologies
Team Auto-Owners
Abigail Onchiri, Gauthier Devolder, Jun Gao, Ashwin Jayakumar
Team Auto-Owners
Project Plan Presentation

Screen Mockup

Microsoft State Career Fair
September 30th, 2015
East Lansing, MI

Ohio State Career Fair
October 23rd, 2015
Columbus, Ohio

IT/Actuarial Day
October 18th, 2015
East Lansing, MI

1 2 3 4 5

Admin Tool
Add another event
Delete this event
Team Auto-Owners
Project Plan Presentation
Team Auto-Owners
Project Plan Presentation

Architecture Diagram

Auto-Owners Insurance
Life Home Car Business

Auto Owner HR Recruit system
Architecture

Visual Layer

Parse & Render

Browser

Desktop Mobile Tablet

AngularJS

Server Layer

Express Node.js

Data Layer

Raw Data Query

Micro

MySQL

FTP Request
System Architecture

Team Auto-Owners Project Plan Presentation
### Team Auto-Owners

#### Project Plan Presentation

**Screen Mockup**

<table>
<thead>
<tr>
<th>Auto-Owners</th>
<th>Candidates</th>
<th>Events</th>
<th>Universities</th>
<th>To-do List</th>
<th>Admin</th>
<th>Search</th>
<th>Submit</th>
<th>Logout</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Universities</strong></td>
<td><strong>Sort By</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Ohio State University</td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>University of Michigan</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Michigan State University

<table>
<thead>
<tr>
<th>Information</th>
<th>Attendees</th>
<th>Notes</th>
<th>Total Costs</th>
<th>Status</th>
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<td>#</td>
<td>First Name</td>
<td>Last Name</td>
<td>Major</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Mark</td>
<td>Otto</td>
<td>Computer Science Engineering</td>
<td>Active</td>
</tr>
<tr>
<td>2</td>
<td>Jacob</td>
<td>Thornton</td>
<td>Business</td>
<td>Hired</td>
</tr>
<tr>
<td>3</td>
<td>Larry</td>
<td>Green</td>
<td>Accounting</td>
<td>Rejected</td>
</tr>
</tbody>
</table>

**Recent Candidates**

- Gauthier Devoiler
  - September 15th, 2015
- John Snow
  - September 14th, 2015
Team Auto-Owners
Alpha Presentation
## Team Auto-Owners

### Alpha Presentation

#### Candidates Page

<table>
<thead>
<tr>
<th>Name</th>
<th>University</th>
<th>Area of Interest</th>
<th>Type of Employment</th>
<th>Date Applied</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bob Evans</td>
<td>Michigan State University</td>
<td>Database Engineer</td>
<td>Full-time</td>
<td>2015-07-25</td>
<td>Interview scheduled</td>
</tr>
<tr>
<td>Ed Cone</td>
<td>Michigan State University</td>
<td>Accountant</td>
<td>Intern</td>
<td>2015-08-15</td>
<td>Received application</td>
</tr>
<tr>
<td>Ian Huss</td>
<td>University of Michigan</td>
<td>Call Center Consultant</td>
<td>Full-time</td>
<td>2015-08-26</td>
<td>Under Review</td>
</tr>
<tr>
<td>Matt Camileti</td>
<td>Michigan State University</td>
<td>IT Technician</td>
<td>Part-time</td>
<td>2015-08-06</td>
<td>Offer sent, pending response</td>
</tr>
<tr>
<td>Michael Taylor</td>
<td>Michigan State University</td>
<td>Clerk</td>
<td>Full-time</td>
<td>2015-08-25</td>
<td>Received application</td>
</tr>
<tr>
<td>Sarah Jones</td>
<td>Ohio State University</td>
<td>Business Analyst</td>
<td>Intern</td>
<td>2015-07-18</td>
<td>Under review</td>
</tr>
<tr>
<td>Stephen Murray</td>
<td>Delta College</td>
<td>IT Technician</td>
<td>Part-time</td>
<td>2015-08-13</td>
<td>Offer sent, pending response</td>
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</tbody>
</table>

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</thead>
</table>

Showing 1 to 7 of 7 entries
Team Auto-Owners
Alpha Presentation

About Abigail Onchiri

- **New Submissions**
  - Submitted Videos
  - Emails

**Previous Work Experience**
- General Electric: Product Manager Intern
- Apple: iOS development Intern
- Michigan State University: IT services Intern

**Education**
- B.S. in Computer Science from Michigan State University
- GPA: 3.5
- Years Completed: Four

**Skills**
- UI Design
- Coding
- Java

**Location**
- 2900 Northwind Dr., East Lansing, Michigan 48823
- Email Address: onchiri@gmail.com
- Phone Number: 517-900-4108

**Additional Notes**
- Referenced by: Scott Lake
- Interview Stage: 1

Actions Page
Team Auto-Owners
Alpha Presentation

Application Form
Team Auto-Owners Beta Presentation
# Team Auto-Owners Beta Presentation Candidates Page

## Candidates

<table>
<thead>
<tr>
<th>Number of active applicants</th>
<th>Applications received this month</th>
<th>Unique visitors this month</th>
<th>Monthly drop-off rate</th>
</tr>
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<tbody>
<tr>
<td>132</td>
<td>44</td>
<td>65</td>
<td>67%</td>
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</tbody>
</table>

### Applicants

<table>
<thead>
<tr>
<th>Name</th>
<th>University</th>
<th>Area of Interest</th>
<th>Type of Employment</th>
<th>Date Applied</th>
<th>Status</th>
</tr>
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Showing 1 to 7 of 7 entries
Team Auto-Owners
Beta Presentation

The Capstone Experience
Team Auto-Owners Beta Presentation
Recruiting Events

Current Events

- Michigan State Career Fair, September 30th, 2015, East Lansing, MI
- Ohio State Career Fair October 23rd, 2015 Columbus, Ohio
- Central Michigan University Career Fair, October 8th, 2015, East Lansing, MI
- IT/Actuarial Day October 16th, 2015 Columbus, Ohio

Michigan State Career Fair

September 30th, 2015, East Lansing, MI

EVENT COST

$1,200

Hired 3 full time hires and 4 interns

Applicants that attended Event

- Abigail Onchiri - Full Time
- Miriam Warthera - Intern
- Jun Gao - Full Time
- Ashwin Jayakumar - Intern
- Brown Bene - Full Time
Team Auto-Owners Design Day
The Capstone Experience

Team Ford

Department of Computer Science and Engineering
Michigan State University
Fall 2015
Utility is their middle name.

EXPLORE CROSSTERS & SUVS
Team Ford
Project Overview

Connected Vehicle Protocol Test Harness

• Functionalities
  ▪ Evaluate Connected Vehicle Communication Protocols
  ▪ For Suitability for Enhanced Customer Experiences
    o Faster Cellular Networks
    o Greater Customer Expectations
  ▪ Using Software Test Harness

• Features
  ▪ Execute Various Communication Protocols
    o Repeatable Consistently
    o Measurable
  ▪ Store and Visualize Metrics Securely
  ▪ Support Range of File Sizes From 10MB to 10GB
  ▪ Interface with Various Ford Connected Vehicle Hardware
  ▪ Provide Strengths and Weaknesses of Each Protocol

• Technologies
  ▪ RESTful Web Services
  ▪ Cloud Services (Microsoft Azure)
  ▪ MQTT
  ▪ JSON
  ▪ XML
  ▪ AMQP

Dearborn, Michigan
Team Ford
Weilong Li, Eric Coldwell, Ryan Bruns, Alex Bergman, Usman Majeed
Team Ford
Project Plan Presentation

Screen Mockup

The Capstone Experience
Team Ford
Alpha Presentation
Team Ford
Alpha Presentation

Discovery Box GUI

Connected Vehicle Protocol Test Harness

Select Protocol

REST
AMQP
MQTT

Effects

Effects

Normal
Chunk Size
1KB
File Size
1KB
Encryption Style
None

Run

Test Results
Protocol: AMQP
File Size: 550KB
Package Size: 1KB
Packages Sent: 550
Packages Resent: 0
Total Time: 0.903 seconds
### Test Results

<table>
<thead>
<tr>
<th>Trial</th>
<th>Protocol</th>
<th>Packets Sent</th>
<th>Packets Resolved</th>
<th>Loss Rate (%)</th>
<th>Time (ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MQTT</td>
<td>6</td>
<td>4</td>
<td>0.33</td>
<td>100</td>
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<tr>
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<td>MQTT</td>
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<td>4</td>
<td>0.20</td>
<td>65</td>
</tr>
<tr>
<td>3</td>
<td>AMQP</td>
<td>25</td>
<td>24</td>
<td>0.04</td>
<td>300</td>
</tr>
<tr>
<td>4</td>
<td>MQTT</td>
<td>6</td>
<td>4</td>
<td>0.33</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td>MQTT</td>
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<td>30</td>
<td>0.00</td>
<td>350</td>
</tr>
<tr>
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<td>34</td>
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<td>380</td>
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<tr>
<td>7</td>
<td>AMQP</td>
<td>12</td>
<td>12</td>
<td>0.00</td>
<td>125</td>
</tr>
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<td>75</td>
<td>70</td>
<td>0.03</td>
<td>700</td>
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<tr>
<td>9</td>
<td>REST</td>
<td>15</td>
<td>15</td>
<td>0.00</td>
<td>300</td>
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<tr>
<td>10</td>
<td>AMQP</td>
<td>6</td>
<td>6</td>
<td>0.00</td>
<td>100</td>
</tr>
</tbody>
</table>

Showing 1 to 10 of 10 entries
Team Ford
Alpha Presentation
Team Ford
Alpha Presentation
Web Dashboard Visualization

Test Results

Values

Time

1 2 3 4 5

MQTT AMQP REST Average

The Capstone Experience
Team Ford

Beta Presentation

Discovery Box GUI

![Image of Discovery Box GUI diagram showing test results for REST, AMQP, and MQTT protocols with details on running times, speeds, and data sizes.]
Team Ford
Beta Presentation

Home Page
The Capstone Experience

Team GM

Department of Computer Science and Engineering
Michigan State University
Fall 2015
Find the GM vehicle that’s right for you.

EXPLORE ALL GM VEHICLES
Team GM
Project Overview

Asynchronous Service Desk Callback App

• Functionalities
  ▪ Submit Request for Help and Callback
  ▪ By GM Employee
  ▪ To Global Service Desk
  ▪ Using Mobile App

• Features
  ▪ Integrate with Knowledge Management System
    o Show Potential Solutions
    o Cancel Help Request if Problem Solved
  ▪ Provide Intelligent Queueing Mechanism
    o Select Optimal Callback Time
    o Based on Availability of Service Desk Operator and Employee
  ▪ Support both Apple and Android Devices

• Technologies
  ▪ Google Android Tablets and Phones / Java
  ▪ Apple iPads and iPhones (iOS) / Swift or Objective-C
  ▪ RESTful Web Services
  ▪ CSS / HTML / JavaScript
  ▪ Exchange / Outlook
Team GM
Brian Hart, Michael Palmer, Corbin Rangler, Evan Hlavaty, Sean Rabaut
Team GM
Project Plan Presentation

Screen Mockups

**My Tickets**

- **Incident**
  - I cannot login into my outlook account with my new GMID password
  - Status: Submitted

- **Incident**
  - Frequent GMID lockouts
  - Status: Dispatched

- **Request**
  - I need my password reset
  - Status: Callback

- **Request**
  - I cannot figure out how to turn on my computer
  - Status: Closed

**My Tickets**

- **Incident**
  - I cannot login into my outlook account with my new GMID password
  - Status: Submitted

- **Incident**
  - Frequent GMID lockouts
  - Status: Dispatched

- **Request**
  - I need my password reset
  - Status: Callback

- **Request**
  - I cannot figure out how to turn on my computer
  - Status: Closed

**Incident**

- **Status**: Submitted
- 3:15PM EST
- 9/25/2015
- Interaction ID: SD102900036

**Issue:**
I cannot login into my outlook account with my new GMID password

**Additional Information:**
Ever since I changed my password my outlook says it can not connect to the exchange server

Has this issue been resolved?

- YES
- NO

**Call Global Service Desk**
Team GM
Project Plan Presentation

Architecture Diagram

Website
- Ticket Queue
- Ticket View

iOS
- Service Request
- Status View
- Queue View
- Call Scheduling
- Login

Website gets updated with incoming ticket information and user availability

JSON Requests to Apache2, Data Posted back

ME Authenticates Logins and references user schedules to avoid calling while a user is busy

Apache 2
Ubuntu
MySQL

Servers

Microsoft Exchange
System Architecture

Website

IOS

Servers

Microsoft Exchange
Team GM
Project Plan Presentation

Screen Mockup

- Add Ticket
- Rest Password Help
- How Do I Change My Password?
- Password Article #3

- No Results Found
- Would you like to submit a new ticket?
- YES
- NO THANKS

- Issue
- I can not login into my outlook account with my new GMID password

- Add Additional Information

- Incident
- Call Me
- No Call
- I'll Call

Submit
Team GM
Alpha Presentation
### Web Ticket Queue

<table>
<thead>
<tr>
<th>Interaction ID</th>
<th>Category</th>
<th>Title</th>
<th>Phase</th>
<th>Status</th>
<th>Contact By</th>
<th>Submitted On</th>
</tr>
</thead>
<tbody>
<tr>
<td>5D0000000012</td>
<td>Incident</td>
<td>I need to react my pass...</td>
<td>Pending</td>
<td>Open</td>
<td></td>
<td>10-08-15, 06:19:06 PM...</td>
</tr>
<tr>
<td>5D0000000020</td>
<td>Incident</td>
<td>how do I add a signature...</td>
<td>Pending</td>
<td>Open</td>
<td></td>
<td>10-10-15, 02:48:22 PM...</td>
</tr>
<tr>
<td>5D0000000032</td>
<td>Incident</td>
<td>I need to change my OU...</td>
<td>Pending</td>
<td>Open</td>
<td></td>
<td>10-14-15, 07:07:28 PM...</td>
</tr>
<tr>
<td>5D0000000033</td>
<td>Incident</td>
<td>I have a pop up on my screen</td>
<td>Pending</td>
<td>Open</td>
<td></td>
<td>10-14-15, 07:07:51 PM...</td>
</tr>
</tbody>
</table>

**Interaction id: 5D0000000033**

**Description:** I have a pop up on my screen
Team GM
Beta Presentation

Find a Resolution

Outlook

Add Signature to Message - Outlook
Guide to add a signature to an outgoing outlook message.

Create Email Message - Outlook
Guide to create a new email message from Outlook.

Add a signature to messages
In Outlook 2013 and Outlook 2016, you can create personalized signatures for your email messages that include text, images, your electronic business card, a logo, or even an image of your handwritten signature. You can set it up so that signatures can be added automatically to all outgoing messages, or you can choose which messages include a signature.

Set up a signature to appear automatically in every email you send
1. On the Home tab, click New Email.
2. On the Message tab, click Signature > Signatures.

Was this helpful?
If not, choosing No will continue submitting ticket

Continue
Team GM
Beta Presentation
The Capstone Experience

Team Meijer

Department of Computer Science and Engineering
Michigan State University
Fall 2015
Team Meijer
Project Overview

In-Store Price Compare

• Functionalities
  ▪ Compare Meijer Price Against List of 3rd Party Stores
    o Brick and Mortar
    o Online
    o Near Me
  ▪ By Scanning Barcode
  ▪ Using Mobile Device

• Features
  ▪ Provide Web Service to Interface with Devices
  ▪ Support 3rd Party Services (Best Buy, Walmart, Amazon, Etc.)
  ▪ Store Results and Provide Meijer Business Intelligence Web App
    o What products are being scanned the most?
    o Where are the largest price gaps?
    o What are the smallest and largest prices and what competitors have them?
    o Etc?
  ▪ Possibly Provide Custom Meijer Coupon Based on Price Gap

• Technologies
  ▪ Apple iPhones (iOS) / Swift or Objective-C
  ▪ Xamarin or PhoneGap
  ▪ Microsoft .NET Framework / C# / ASP.NET / Azure Mobile Services
  ▪ SQL Server 2012
  ▪ Meijer Web Services
  ▪ Crashlytics
  ▪ GitHub
Team Meijer
Brian Wyss, Brandon Bielicki, Spencer Ottarson, Zandra Russell, Tony Laurain
Team Meijer
Project Plan Presentation

Screen Mockup

Align barcode edges with arrows

Done

Product Name

Product Description

COMPETITOR PRICES

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
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<td>#3</td>
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</tbody>
</table>
Team Meijer
Project Plan Presentation  Architecture Diagram

The Capstone Experience
System Architecture

Team Meijer
Project Plan Presentation
### Team Meijer

**Project Plan Presentation**

#### Screen Mockup

**Location:** Okemos - 2055 W Grand River, Okemos, MI

**Sort by:** Product Name

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Location</th>
<th>Time</th>
<th>UPC</th>
<th>Department</th>
<th>Meijer Price</th>
<th>Walmart Price</th>
<th>Best Buy Price</th>
<th>Target Price</th>
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<tbody>
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</tr>
</tbody>
</table>
Team Meijer Alpha Presentation
Team Meijer

Alpha Presentation

Mobile App: Scan and Result

The Capstone Experience
Team Meijer
Alpha Presentation

Mobile App: Coupon Popup
Team Meijer
Alpha Presentation
### List of Scans

<table>
<thead>
<tr>
<th>No</th>
<th>UPC</th>
<th>Store</th>
<th>Datetime</th>
<th>AmazonPrice</th>
<th>WalmartPrice</th>
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<td>10/12/2015 5:11:18 AM</td>
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<td>78.57</td>
<td>64.99</td>
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<tr>
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<td>10/12/2015 5:11:24 AM</td>
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<td>78.57</td>
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<td>401.49</td>
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<td>78.57</td>
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<td>10/12/2015 6:32:11 PM</td>
<td>69.99</td>
<td>78.57</td>
<td>64.99</td>
</tr>
</tbody>
</table>
Team Meijer
Beta Presentation

Mobile Scan Screen
2013 Rose Bowl
Presented By Vizio -
Stanford Vs. Wisconsin
(Blu-ray + DVD)

$16.29

Other Prices

amazon.com
$12.94

Walmart
$16.29

CLICK FOR COUPON
Team Meijer
Beta Presentation

Web Graphs Page: Pie Chart
The Capstone Experience

Team MSUFCU

Department of Computer Science and Engineering
Michigan State University
Fall 2015
Building Dreams Together
Welcome, MSU Students!

Open your MSUFCU account, receive a FREE Spartan T-Shirt! Plus, when you open your account online, you could win 1 of 100 prizes!

Open Your Account

What's New @ MSUFCU
- Receiving a website security error? Click here.
- Bill Payment Now Available on MSUFCU Mobile App
- Help Support The Sparrow Children's Center Toy Drive
- Discounted Cedar Point & Michigan's Adventure Tickets Available

Upcoming Events
- Financial U - Earn & Learn
  Tuesday, September 15
  View all events >>

Current Rates
- Loans: Home Loans, Savings, Business
- Auto Loan: as low as 2.450% APR
- Platinum Visa: as low as 8.900% APR
- U.S. Savings: as low as 0.000% APR
Online Dollar Dog Store

• Functionalities
  ▪ Promote Financial Education of Children Everywhere
    o Deposits Earn Dollar Dog Coins
    o Can Be Redeemed in Dollar Dog Stores
    o But Currently Only in 13 Lansing Branches
  ▪ By Expanding Dollar Dog Program
    o From Limited Physically Branch-Based
    o To Unlimited Virtually Mobile and Web-Based

• Features
  ▪ Provide Access to Dollar Dog Program Online
    o View Dollar Dog Coin Balances
    o Award Coins for Participation in Online Educational Activities
    o Shop for Prizes at the Dollar Dog Store
  ▪ Support Apple (iOS), Android and Web Apps
  ▪ Integrate Seamlessly With Existing MSUFCU Software
  ▪ Provide MSUFCU Management Web App
    o Add/Remove and Inventory Prizes
    o Adjust Dollar Dog Coin Balances
  ▪ Send Text Messages to Users
  ▪ Ensure High Level of Security

• Technologies
  ▪ Google Android Tablets and Phones / Java
  ▪ Apple iPads and iPhones (iOS) / Swift or Objective-C
  ▪ CSS / HTML
  ▪ PHP
  ▪ JavaScript
  ▪ Encryption Based on SQL Standards
Team MSUFCU
Zac Walters, Ryan McIntyre, Andrew MacAfee, Aaron Ta, Neha Gupta
Team MSUFCU
Project Plan Presentation

Screen Mockup
Team MSUFCU
Project Plan Presentation

Architecture Diagram

Android App: Java

iOS App: Xcode

Web App: CSS, HTML, JS

Query API

Web Admin App

MySQL Database

MSUFCU Corporate Database

PDO

Access user account information

PHP

The Capstone Experience
Team MSUFCU
Project Plan Presentation

Screen Mockup
Team MSUFCU
Alpha Presentation
Team MSUFCU
Alpha Presentation

Mobile Login & Item Catalog

Dollar Dog Store

Username
Password
LOG IN

Item Catalog

- Backpack: 100 coins
- Book: 20 coins
- Dollar Dog Dressed Animal: 50 coins
- Bunny Ball: 10 coins
- Cup: 75 coins
- Backpack: 100 coins
Team MSUFCU
Alpha Presentation
Shopping Cart & Confirmation
<table>
<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>David</td>
<td>Evans</td>
<td><a href="mailto:devans02@pmmeb.com">devans02@pmmeb.com</a></td>
</tr>
<tr>
<td>Willia</td>
<td>Sanders</td>
<td><a href="mailto:wssanders1@photobucket.com">wssanders1@photobucket.com</a></td>
</tr>
<tr>
<td>Carolyn</td>
<td>Barnes</td>
<td><a href="mailto:cbarnes2@libbe.com">cbarnes2@libbe.com</a></td>
</tr>
<tr>
<td>Stephanie</td>
<td>Werner</td>
<td><a href="mailto:swerner1@goole.com">swerner1@goole.com</a></td>
</tr>
<tr>
<td>Neha</td>
<td>Gupta</td>
<td><a href="mailto:nehag07@gmail.com">nehag07@gmail.com</a></td>
</tr>
</tbody>
</table>
Team MSUFCU
Beta Presentation

Android Purchase and Catalog

Welcome Neha!

You have 10 coins

Thank You!

Sales Report

Total: 35 Coins

Neon Plastic LE... 25 1
Coloring Book 10 1

You have 45 coins

Glow In The Dark Bouncing Ball
Coloring Book

Noise Putty 10
Backpack 15
Team MSUFCU
Beta Presentation

iPad Catalog

Catalog

- Glow-In-The-Dark Egg: 5 coins
- Coloring Book: 10 coins
- Noise Putty: 10 coins
- Backpack: 15 coins
The Capstone Experience

Team Quicken Loans

Department of Computer Science and Engineering
Michigan State University
Fall 2015
Quicken Loans
Engineered to Amaze™
Team Quicken Loans
Project Overview

Enterprise Roadmap Tool

- Functionalities
  - Visual Computer Systems Enterprise Road Mapping Tool
  - For Senior Leadership
  - To Show Future
     - Major Computer System Changes
     - New Application Development
  - Replacing Word Documents

- Features
  - Model Initiatives
     - High Level Features
     - Business Value
     - Size
     - Start Date
     - Dependencies
  - Show Interdependencies and Roadmaps
  - Provide Search Capabilities
  - Generate Reports
     - Roadmaps for Initiatives
     - Reports on Business Values

- Technologies
  - .NET / Web Development
  - SQL Server
  - UI / UX Expertise
Team Quicken Loans
Brian Chivers, Chase Grove, Emily Klopfer, Eric Nartker, Ben Toth
Team Quicken Loans
Project Plan Presentation

Screen Mockup
Team Quicken Loans
Project Plan Presentation
Team Quicken Loans
Project Plan Presentation

Architecture Diagram

Web Front End

- Microsoft SQL Server
- IIS Web Server
- Login System
- Home Page
- Roadmap Creation Tool
- Roadmap Presenter
- Timeline Management
- Project Management
The Capstone Experience

Team Quicken Loans
Project Plan Presentation

Screen Mockup
# Team Quicken Loans Alpha Presentation

## Brian's Roadmaps

<table>
<thead>
<tr>
<th>Name</th>
<th>Author</th>
<th>Description</th>
<th>Last Edited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proj1</td>
<td>Brian Chivers</td>
<td>Make e-Commerce Website</td>
<td>2/2/2015</td>
</tr>
<tr>
<td>Proj2</td>
<td>Chase Grove</td>
<td>re-engineer existing software</td>
<td>3/12/2015</td>
</tr>
<tr>
<td>Proj3</td>
<td>Brian Chivers</td>
<td>Create new mobile application</td>
<td>4/10/2015</td>
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</table>

## All Roadmaps

<table>
<thead>
<tr>
<th>Name</th>
<th>Author</th>
<th>Description</th>
<th>Last Edited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proj1</td>
<td>Brian Chivers</td>
<td>Make e-Commerce Website</td>
<td>2/2/2015</td>
</tr>
<tr>
<td>Proj2</td>
<td>Chase Grove</td>
<td>Create Web application to view data</td>
<td>1/1/1</td>
</tr>
<tr>
<td>Proj3</td>
<td>Brian Chivers</td>
<td>re-engineer existing software</td>
<td>3/12/2015</td>
</tr>
<tr>
<td>Proj4</td>
<td>Eric Narbier</td>
<td>Integrate new software into systems</td>
<td>1/1/1</td>
</tr>
<tr>
<td>Proj5</td>
<td>Brian Chivers</td>
<td>Create new mobile application</td>
<td>4/10/2015</td>
</tr>
</tbody>
</table>
Team Quicken Loans
Alpha Presentation

Add Style

Description
The group will need to go through and develop all of the CSS files to make the visual friendly. Also color code the project to the Quicken Loans Standard.

Dependencies
Fix the Table
Add Selection

Risks
The visualization needs to be readable by the recipients of the roadmaps.

Links
Add Link

Save
### test's ROADMAPS

<table>
<thead>
<tr>
<th>Name</th>
<th>Author</th>
<th>Description</th>
<th>Timestamp</th>
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<tbody>
<tr>
<td>Data Visualization Tools</td>
<td>test</td>
<td>Create better tools for business analysis</td>
<td>11/15/2015 3:28:27 PM</td>
</tr>
<tr>
<td>New Intranet Site</td>
<td>test</td>
<td>Better intranet homepage for employees</td>
<td>11/15/2015 3:29:16 PM</td>
</tr>
<tr>
<td>Upgrading HR System</td>
<td>test</td>
<td></td>
<td>11/15/2015 3:25:44 PM</td>
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### All Roadmaps

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</tr>
</thead>
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<tr>
<td>Data Visualization Tools</td>
<td>test</td>
<td>Create better tools for business analysis</td>
<td>11/15/2015 3:28:27 PM</td>
</tr>
<tr>
<td>Highlighting Testing</td>
<td>eric</td>
<td>Make sure Highlight Can work</td>
<td>11/15/2015 3:27:04 PM</td>
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<td>MichiganState/TechPlans</td>
<td>chaybaybaxy</td>
<td>new plans for some tech for michigan state</td>
<td>11/15/2015 3:26:09 PM</td>
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<tr>
<td>New Intranet Site</td>
<td>test</td>
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<td>3.0</td>
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<td>11/15/2015 3:26:44 PM</td>
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</table>
Team Quicken Loans
Beta Presentation
Completed Roadmap
The Capstone Experience

Team Quicken Loans
Beta Presentation

Roadmap Modal Information
The Capstone Experience

Team Spectrum Health

Department of Computer Science and Engineering
Michigan State University
Fall 2015
Team Spectrum Health
Project Overview

Patient Service Delivery Planning

• Functionalities
  ▪ Optimize Patient Care Service Delivery
  ▪ For Patients By Identifying Facilities with Shortest Wait Times
  ▪ For Spectrum Health By Predicting Staffing Needs In Advance

• Features
  ▪ Gather and Integrate Data from Multiple Sources
    o Spectrum Health Census Web Service
    o Center for Disease Control
    o Weather Services
  ▪ Track Patient Loads at Facilities
  ▪ Build Predictive Model of Staffing Two Weeks in Advance
  ▪ Provide
    o Mobile App for Patients
    o Web App for Spectrum Health

• Technologies
  ▪ CSS / HTML / JavaScript / AngularJS
  ▪ ASP.net Web API (C#)
  ▪ Microsoft IIS 7.5
  ▪ NoSQL / Cassandra
  ▪ RESTful Web Services
  ▪ Browser-Based Visualization
Team Spectrum Health
Jim Torres, Justin Oh, Josh Curl, Chaz Bean, Luke Stanton
Team Spectrum Health
Project Plan Presentation

Architecture Diagram

Staff UI
- HTML/CSS
- Bootstrap
- Angular.js
- D3.js

Patient UI
- HTML/CSS
- Bootstrap
- Angular.js

Spectrum Health API

Weather Channel API

CDC API

United States Census Bureau API

RESTful Backend Server
- .NET/C#
- Math.NET Numerics
- Web API

Mongo
Team Spectrum Health
Project Plan Presentation

Screen Mockup
Team Spectrum Health
Alpha Presentation

The Patient Interface
Team Spectrum Health

Alpha Presentation

The Patient Interface

- Recommended
  - South Pavilion Urgent Care
    - 4 miles away
    - 11 patients waiting per provider

- Nearest
  - Zeeland Community Hospital Urgent Care
    - 0.4 miles away
    - 11 waiting per provider

- Hide
- Show all

- Digital Care
  -南区医疗中心
  -4 miles away
  -11 patients waiting per provider
Team Spectrum Health
Alpha Presentation

Spectrum Health Interface
Team Spectrum Health
Beta Presentation
Team Spectrum Health
Beta Presentation

Patient Mobile Apps
Team Spectrum Health
Beta Presentation

Staff Web App
Team Spectrum Health
Beta Presentation
Team Spectrum Health

Beta Presentation

Staff Web App
The Capstone Experience

Team Symantec

Department of Computer Science and Engineering
Michigan State University
Fall 2015
Stagefright vulnerabilities pose serious threat to Android users. Learn more.

Cybercrime: New Tricks of the Trade

Know where threats are coming from with the Symantec 2015 Internet Security Threat Report

Get the Report
Integrated Silent Authentication via Symantec VIP

• Functionalities
  ▪ Embed Two Factor Authentication
  ▪ Into Native Mobile Apps
  ▪ Sending Six-Digit Authentication Code
    o Automatically
    o “Silently”

• Features
  ▪ Require User to Enter Only Userid and Password
  ▪ Send Six-Digit “Second” Factor
    o Without Direct User Interaction
    o Using Symantec VIP SDK
  ▪ Demonstrate on Both Android and iPhone

• Technologies
  ▪ Google Android Tablets and Phones / Java
  ▪ Apple iPads and iPhones (iOS) / Swift or Objective-C
  ▪ Symantec VIP
Team Symantec
Chris Perry, James Mariani, Tyler Erskine, Scott Binter, Dan Parlin
Team Symantec
Project Plan Presentation

Screen Mockup
Team Symantec
Project Plan Presentation  Architecture Diagram

Authenticated a Mobile Device

1. Send Username and password
2. Query database for username and password
3. Confirms user/pass, Asks for device code
4. "VIP push call" returns device code for current device
5. Sends VIP device code
6. Request / return current device code
7. Verified login complete
Team Symantec
Alpha Presentation
Adding Users to VIP
Initiating VIP Account

Clock It Pro

- Initiating VIP Account
- Issuing Secure Credential
- Finalizing VIP Account
Team Symantec
Beta Presentation

Enterprise Mail Pin Screen

![Enterprise Mail Pin Screen](image-url)
The Capstone Experience

Team TechSmith

Department of Computer Science and Engineering
Michigan State University
Fall 2015
Screen Recording & Video Editing

A powerful, yet easy-to-use screen recorder, Camtasia helps you create professional videos without having to be a video pro. Easily record your screen movements and actions, or import HD video from a camera or other source. Customize and edit content on both Mac and Windows platforms, and share your videos with viewers on nearly any device.
Team TechSmith
Project Overview

Intelligent Real World Text Recognition

- Functionalities
  - Using Mobile Device (Camera)
  - Recognize Text in the Real World
  - Perform Useful Actions
    - Call a Phone Number
    - Go to a URL
    - Map a Street Address
    - Tweet a Hashtag
    - Etc.

- Features
  - Highlight Recognized Text in Camera View
  - Offer to Take Action on Recognized Text
  - Save Recognized Text in Appropriate Places
  - Use Windows 10 UWP OCR Engine API
  - Demonstrate Raspberry Pi “Reading Station”
    - Visually Impaired
    - Learning to Read
  - Store Things Seen in Cloud Backend

- Technologies
  - Windows 10 Universal Windows Platform Apps
  - Raspberry Pi
  - CSS / HTML5 / JavaScript
  - C#/Net and XAML
  - Microsoft Azure Cloud Computing
Team TechSmith
Jordyn Castor, Deb Deb, Whitney Mitchell, Max Miller, Cody Pearson
The Capstone Experience

Team TechSmith
Project Plan Presentation

Screen Mockup

We

doug@web.com

123-456-7890

Text

Settings

Saved

History

Phone Numbers

Email Addresses

Addresses

Scan

Again

Save

Call

Scan

Again

History

Phone Numbers

Email Addresses

Addresses

Text
Team TechSmith
Project Plan Presentation
Team TechSmith
Project Plan Presentation

Architecture Diagram

- Data outside of the device
- Native part of the app
- On device, but outside of app
Team TechSmith
Project Plan Presentation
Screen Mockup

We found......

doug@web.com

123-456-7890

Call  Save

Scan Again
Team TechSmith
Alpha Presentation
Tap the screen to begin recognition
The Capstone Experience

Team TechSmith

Alpha Presentation

Results Page
Team TechSmith Beta Presentation
The Capstone Experience

Team TechSmith
Beta Presentation

Press To Begin Recognition
The Capstone Experience

Team Urban Science

Department of Computer Science and Engineering
Michigan State University
Fall 2015
Team Urban Science
Project Overview

Visualizing Brand Loyalty

• Functionalities
  ▪ Visualize Brand Loyalty
  ▪ For OEM Loyalty Managers
  ▪ Using Native Tablet Apps

• Features
  ▪ Visualize
    ○ Repurchase Loyalty Rates by Brand and Segment
    ○ Conquest / Defector Ratios for All Brands
    ○ Trends on All Key Performance Indicators (KPIs)
  ▪ Support KPI Grouping by Geographic Region
    ○ National
    ○ Regional
    ○ Market
  ▪ Provide Native Apps for Both Android and Apple iOS
  ▪ Send Intelligent Alerts

• Technologies
  ▪ Google Android Tablets and Phones / Java
  ▪ Apple iPads and iPhones (iOS) / Swift or Objective-C
  ▪ SQL Server 2012
  ▪ Visual Studio 2013
Team Urban Science
Meghan Huynh, Jeff Baum, Nick Durak, Richard Brush, Asha Patel
Team Urban Science
Project Plan Presentation

Screen Mockup

**United States**

- Michigan: 8.7
- Ohio: 8.1
- New York: 7.5
- Florida: 6.3
- California: 5.7
- Washington: 5.2
- Delaware: 4.9
- Rhode Island: 3.0
- South Carolina: 2.7
- North Carolina: 1.9
- Hawaii: 1.8
- Nevada: 1.6
- Texas: 1.2
- Oregon: 0.9
- Utah: 0.7
- Nebraska: 0.6

**Ford Loyalty in the United States**

- 2008
- 2010
- 2012
- 2014
- 2016

**Ford Customers**

- Loyal
- Conquest
- Defector

**Conquest : Defectors**

- 2.17
Team Urban Science
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Team Urban Science
Alpha Presentation

Push Notifications
Team Urban Science
Alpha Presentation

Criteria Menu

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Beta Presentation

Choropleth Map

![Image of a tablet displaying a choropleth map and other data visualizations.](image-url)
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Bubble Chart
Team Urban Science
Beta Presentation
Team Urban Science

Beta Presentation

Push Notification Creation
Team Urban Science
Design Day
The Capstone Experience

Team Whirlpool

Department of Computer Science and Engineering
Michigan State University
Fall 2015
Whirlpool Indoor Maps

- Functionalities
  - Help Whirlpool Employees Navigate Buildings
  - By Providing
    - Search by Room and Employee
    - Maps
    - Turn-By-Turn Directions
  - Using Mobile Apps

- Features
  - Authenticate Users with Google Authentication
  - Display Whirlpool Facility Maps
  - Gather Room Details from XML Data
  - Locate Available Conference Rooms
  - Integrate with Google Calendar
  - Support Both Native Android and Apple iOS Apps
  - Provide Web App

- Technologies
  - Google Android Tablets and Phones / Java
  - Apple iPads and iPhones (iOS) / Swift or Objective-C
  - Google Maps SDKs (for iOS and Android)
  - Google Enterprise Authentication
  - Micello JavaScript API
  - SQL Server
  - Custom XML Parser
  - RESTful Web Services
Team Whirlpool
Christian White, Steph Brown, Zoe Hayes, Jallal Elhazzat, Greg Richard
Team Whirlpool

Project Plan Presentation

Architecture Diagram

Google Authentication

2341516

Now you're logged in

Google

Micello Indoor maps Data

Click Event/ Request a map

GET and POST/ Return a map

Request Data
Room location

Return Data
Room location

Micello

Click Event/ Request a map

GET and POST/ Return a map

Request Data
Room location

Return Data
Room location

Whirlpool's maps data

Whirlpool Database

Pull room attributes

Book a room

iOS / Android Application
Team Whirlpool
Project Plan Presentation
Team Whirlpool
Alpha Presentation
Team Whirlpool
Alpha Presentation

Home Screen
Team Whirlpool
Alpha Presentation
Team Whirlpool

Beta Presentation

Home Screen

The Capstone Experience
Team Whirlpool
Beta Presentation

Room Information

- Occupancy: 13
- Available Now: Not available
- TV: Available
- Conference Speaker: Available
Team Whirlpool
Beta Presentation
Team Whirlpool
Beta Presentation

Navigation Screen
Team Whirlpool
Design Day
The Capstone Experience

Dr. Wayne Dyksen
Department of Computer Science and Engineering
Michigan State University
Fall 2015
Capstone Lab
View of Spartan Stadium
Capstone Lab
View of Spartan Stadium sans Smokestack
Capstone Lab
Winter View of Spartan Stadium
The Capstone Experience

Design Day Award Winners

December 11, 2015
All-Hands Design Day, December 5, 2014
Auto-Owners Exhibition Award
Team GM, Fall 2015
Global Service Desk Mobile App
Corbin Rangler, Sean Rabaut, Evan Hlavaty, Brian Hart, Michael Palmer
Scott Lake of Auto-Owners Insurance
MSU Federal Credit Union Praxis Award
Team Symantec, Fall 2015
Integrated Silent Authentication via Symantec VIP
Dan Parlin, Scott Binter, Tyler Erskine, James Mariani, Chris Perry
Presented by Samantha Amburgey of MSUFCU
TechSmith Screencast Award
Team TechSmith, Fall 2015
Intelligent Real World Text Recognition
Deb Deb, Kanpur, Max Miller, Cody Pearson, Whitney Mitchell, Jordyn Castor
Presented by Dewey Hou TechSmith
Urban Science Sigma Award
Team Spectrum Health
Patient Service Delivery Planning
Chaz Bean, Josh Curl, Justin Oh, Jim Torres, Luke Stanton
Presented by Elizabeth Klee and Mike DeRiso of Urban Science
The Capstone Experience

Design Day Award Winners

May 1, 2015
All-Hands Design Day, May 1, 2015
Auto-Owners Exhibition Award
Team Whirlpool, Spring 2015
Launder: Laundry Room Tablet Payment System
Sam Bentzel, Evan Swinehart, Angie Sun, Alex Kambeitz
Scott Lake of Auto-Owners Insurance
General Motors Praxis Award
Team Ford, Spring 2015
Electric Vehicle Charging Station App
Ryan Switzer, Justin Grothe, Kevin Karabon, Brian Jurgess
Presented by Mike Adelson and Fred Killeen of General Motors
TechSmith Screencast Award
Team GM, Spring 2015
Employee Companion Mobile Application
Jacob Ray, Yutaka Iwasaki, Ryan Boyce, Nate Seifert, Derrick Dunville
Presented by Dewey Hou of TechSmith
Urban Science Sigma Award
Team Amazon, Spring 2015
SIFT: Seller-Forums Information Filtering Tool
Presented by Kathy Krauskopf and Matt Bejin of Urban Science
The Capstone Experience

Dr. Wayne Dyksen
Department of Computer Science and Engineering
Michigan State University
Fall 2015