The Capstone Experience

Dr. Wayne Dyksen

Department of Computer Science and Engineering
Michigan State University
Spring 2014
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, 2250 Engineering Building
• Presentations By
  ▪ Professor
  ▪ Teams
    o Status Reports
    o Formal Presentations
      ➢ Project Plan
      ➢ Alpha
      ➢ Beta
    o Project Videos
  ▪ Guest Speakers
<table>
<thead>
<tr>
<th>Date</th>
<th>Meeting Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/06</td>
<td>Course Overview</td>
</tr>
<tr>
<td>01/08</td>
<td>Project Plan</td>
</tr>
<tr>
<td>01/13</td>
<td>Risks and Prototypes</td>
</tr>
<tr>
<td>01/15</td>
<td>Schedule and Teamwork</td>
</tr>
<tr>
<td>01/20</td>
<td>(Martin Luther King Day, No Meeting)</td>
</tr>
<tr>
<td>01/22</td>
<td>Team Status Report Presentations</td>
</tr>
<tr>
<td>01/27</td>
<td>Team Project Plan Presentations</td>
</tr>
<tr>
<td>01/29</td>
<td>Team Project Plan Presentations</td>
</tr>
<tr>
<td>02/03</td>
<td>Team Project Plan Presentations</td>
</tr>
<tr>
<td>02/05</td>
<td>Team Project Plan Presentations</td>
</tr>
<tr>
<td>02/10</td>
<td>Resume Writing and Interviewing</td>
</tr>
<tr>
<td>02/12</td>
<td>Creating and Giving Presentations</td>
</tr>
<tr>
<td>02/17</td>
<td>Team Alpha Presentations</td>
</tr>
<tr>
<td>02/19</td>
<td>Team Alpha Presentations</td>
</tr>
<tr>
<td>02/24</td>
<td>Team Alpha Presentations</td>
</tr>
<tr>
<td>02/26</td>
<td>Team Alpha Presentations</td>
</tr>
<tr>
<td>03/03</td>
<td>(Spring Break, No Meeting)</td>
</tr>
<tr>
<td>03/05</td>
<td>(Spring Break, No Meeting)</td>
</tr>
<tr>
<td>03/10</td>
<td>Status Reports</td>
</tr>
<tr>
<td>03/12</td>
<td>Status Reports</td>
</tr>
<tr>
<td>03/17</td>
<td>Design Day and the Project Videos</td>
</tr>
<tr>
<td>03/19</td>
<td>Camtasia Demo</td>
</tr>
<tr>
<td>03/24</td>
<td>Ethics and Professionalism</td>
</tr>
<tr>
<td>03/26</td>
<td>Intellectual Property</td>
</tr>
<tr>
<td>03/31</td>
<td>Beta Presentations</td>
</tr>
<tr>
<td>04/02</td>
<td>Beta Presentations</td>
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<td>04/07</td>
<td>Beta Presentations</td>
</tr>
<tr>
<td>04/09</td>
<td>Beta Presentations</td>
</tr>
<tr>
<td>04/14</td>
<td>Status Reports</td>
</tr>
<tr>
<td>04/16</td>
<td>Status Reports</td>
</tr>
<tr>
<td>04/21</td>
<td>Project Videos</td>
</tr>
<tr>
<td>04/23</td>
<td>Project Videos and All Deliverables</td>
</tr>
<tr>
<td>04/24</td>
<td>Design Day Setup</td>
</tr>
<tr>
<td>04/25</td>
<td>Design Day</td>
</tr>
<tr>
<td>04/28</td>
<td>Project Videos</td>
</tr>
</tbody>
</table>
The Capstone Experience

Team Auto-Owners

Department of Computer Science and Engineering
Michigan State University
Spring 2014
Drivers usually spend five seconds looking at their phones, which is enough time to cover more than the length of a football field going normal highway speeds.
Team Auto-Owners
Project Overview

Mobile Audit Itinerary and Worksheet

- Functionalities
  - Collect Updated Policyholder Information
  - By Underwriting Field Service Representatives
  - Using Mobile Devices
- Features
  - Support Laptops, Tablets and Smartphones
  - List Daily Appointments
  - Map Out Route
  - Ability to Work Offline
  - Import/Export XML
  - Produce Reports in PDF
- Technologies
  - CSS3
  - HTML5
  - Java
  - JavaScript / jQuery
  - XML
Team Auto-Owners
Jacob Burger, Garrett Stevenson, Ladi Oyeleye
Team Auto-Owners
Project Plan Presentation

Screen Mockup
Team Auto-Owners
Project Plan Presentation
Team Auto-Owners
Project Plan Presentation
Architecture Diagram
System Architecture

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

Screen Mockup

Directions
So and So LCC
Go Go Toys
Jiffy Clean
Sponge Co.
Izto Name Drops

Payroll Information:
- Payroll Worksheet
- Employee Payroll
- Subcontracts
- QTID Worksheet

Name:
Go Go Toys
Address:
123 Street
East Lansing, MI 48823
Itinerary
Team Auto-Owners
Alpha Presentation

Driving Directions

Total Distance: 10.430954976999999 mi

1. Head south on Abbot Rd toward Rampart Way 1.4 mi
2. Turn left onto E Grand River Ave 0.6 mi
3. Turn right onto Bogue St 52 ft

Michigan State University, 220 Trowbridge Rd, East Lansing, Michigan 48824, United States

8.4 mi - about 13 mins
1. Head south on Bogue St 0.4 mi
2. Turn right onto N Shaw Ln 0.3 mi
3. Turn left onto Farm Ln 0.3 mi
4. Turn right onto Trowbridge Rd 0.3 mi
5. Turn left to stay on Trowbridge Rd 1.1 mi
6. Merge onto I-496 W via the ramp to Downtown/Lansing 4.9 mi
7. Take exit 3 for Waverly Rd 0.4 mi
8. Turn right onto S Waverly Rd 0.7 mi
9. Take the 3rd right onto W Michigan Ave 404 ft

3721 West Michigan Avenue, Lansing, MI 48917, USA
Policy Holder Information

Name: 
Address: 
Directions: 

Payroll Information
No payroll information available.

Sales Information
No sales information available.
Team Auto-Owners Beta Presentation

Report Generation

Auto-Owners Insurance
Life Home Car Business

PO BOX 30323, 6200 ANACAPRI BLVD., LANSING, MI 48909

AGENCY CODE: 1
POLICYHOLDER: Derrick McDuffie
POLICY #: 4 WC
POLICY #: 4 PREMIER
POLICY #: 4 GL (FTEE)
AUDIT PERIOD: 11/21/2013 - 11/21/2012
DATE: 03/31/2014
EFFECTIVE DATE: 03/31/2014
EMAIL ADDRESSES: derrickmcduffie@ashutech.com

AUDIT COMPLETED BY Adam Smith
MICHIGAN Branch Underwriting Field Services
TELEPHONE: 517-391-1174 #6
1-800-445-4165 EXT. 1174 #6
FAX: (517) 886-8833
CELL: (517) 886-8833
EMAIL: Smith.Adam@aoins.com

Opening REPORT.pdf
You have chosen to open
REPORT.pdf which is an Adobe Acrobat Document (263 KB) from the date:
What should Firefox do with this file?
- Open with Adobe Reader (default)
- Save File
- Do this automatically for files like this from now on.

WORKERS COMPENSATION & COMMERCIAL GENERAL LIABILITY & GARAGE LIABILITY AUDIT WORKSHEET
The Capstone Experience

Team Boeing

Department of Computer Science and Engineering
Michigan State University
Spring 2014
Team Boeing
Project Overview

Flight Simulator Suite

• Functionalities
  ▪ Flight Simulator Application Suite
  ▪ Fly a Variety of Aircraft
  ▪ In Locations Around the World

• Features
  ▪ Based on FlightGear Flight Simulator
  ▪ Support Networked Multiplayer Mode
  ▪ Observe Flight Traffic Monitors
  ▪ Collect Key Performance Statistics

• Technologies
  ▪ FlightGear Flight Simulator
  ▪ TCP/IP Networking
  ▪ Python, Python GUI
  ▪ Jenkins or GitHub
  ▪ Open Message Queue (MQ)
Team Boeing
Project Plan Presentation

Screen Mockup

MULTIPLAYER  FLIGHT PLAN  GPS  LOG  OTHER FLIGHTS

MULTIPLAYER
Allow Connection?
Enter IP  Enter Port
Connect
Team Boeing
Project Plan Presentation
Team Boeing
Project Plan Presentation

Architecture Diagram

- **SimGear**
  - environment simulator
  - libraries

- **FlightGear**
  - maintains system state and aircraft behaviour;
  - manages events
  - paths to data files

- **Launcher**
  - sets flightgear parameters

- **OpenSceneGraph**
  - graphics middleware
  - scene graph

- **JSBSim**
  - performs calculations for flight dynamics model
  - aircraft xml config file

- **FGData**
  - Models
  - Splash screens
  - Sounds
  - transformation xml config file
Team Boeing
Project Plan Presentation

Screen Mockups
Team Boeing
Alpha Presentation
Team Boeing
Alpha Presentation

Basic GUI
Edit the interval messages are sent from FlightGear

Enter Connection Speed in Seconds: 50

OK Cancel
Team Boeing
Beta Presentation

Flight Logs

A Flight:

Flight Info
- Flight Name: Player
- Latitude: 37.6287 Deg - Longitude: -122.383 Deg
- Speed: 2.52336 Knots
- Heading: 117.889 Deg
- Altitude: 6,017.34 ft
- Current Fuel: 38,186.5 Gals
- Total Fuel Capacity: 56,096 Gals
- Flight Time: 0:15:06.949000
The Capstone Experience

Team Ford

Department of Computer Science and Engineering
Michigan State University
Spring 2014
Mobile Approver

- Functionalities
  - Simplify Business Approval Processes
  - Using Single Common Interface
  - On Mobile Devices
- Features
  - Support Laptops, Tablets and Smartphones
  - Approve, Reject or Send Back Requests
  - Drill Down Through Item-Related Business Logic
  - Connect to Various Existing Back-End Systems
  - Handle QR Code Input
- Technologies
  - CSS / HTML5
  - JavaScript / Ajax
  - PrimeFaces Mobile JSF
  - J2EE (Java 2 Platform Enterprise Edition)
  - Microsoft SQL Server 2008
  - QR (Quick Response) Codes
Team Ford
Project Plan Presentation

Screen Mockups

The Capstone Experience
Team Ford
Project Plan Presentation

Architecture Diagram
Team Ford
Project Plan Presentation

Screen Mockups

Outstanding | History | m
---|---|---
50 x 50 | originator name | 50 x 50
| time record detail | time record detail

Submit | Cancel
50 x 50 | minimal expense report detail

Outstanding | History | m
---|---|---
50 x 50 | originator name | 50 x 50
| time record detail | time record detail

Comment

Data source specific text

Approve | Reject | Detail

Submit | Cancel

Outstanding | History | m
---|---|---
50 x 50 | originator name | 50 x 50
| time record detail | time record detail

Approve | Reject | Detail
Team Ford
Alpha Presentation

Login Screen

[Image: Login screen with Ford logo and input fields for username and password]
Team Ford
Alpha Presentation
Request List

Outstanding

<table>
<thead>
<tr>
<th>Name</th>
<th>Request Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mary Newton</td>
<td>Requesting a new 3D printer for Engineering Department to test out new products in development.</td>
</tr>
<tr>
<td>Howie Smith</td>
<td>Requesting vacation time off for 5/5/2014-5/9/2014 to visit Germany</td>
</tr>
<tr>
<td>Dale Johnson</td>
<td>Requesting 1,000 pounds of plastics to test out new materials</td>
</tr>
</tbody>
</table>
Team Ford
Alpha Presentation

QR Code Scanner

The page at teamford-web.cse.msu.edu:8080...
http://en.m.wikipedia.org
OK
## Team Ford

### Beta Presentation

<table>
<thead>
<tr>
<th>Outstanding</th>
<th>History</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheeler, Douglas</td>
<td>Please approve Microsoft Excel Training</td>
</tr>
<tr>
<td>Mendez, Matt</td>
<td>Please approve NCAA Bracket challenge</td>
</tr>
<tr>
<td>Vargas, Audrey</td>
<td>Please approve C++ training</td>
</tr>
<tr>
<td>Powers, Salvatore</td>
<td>Please approve Sharepoint Training</td>
</tr>
<tr>
<td>French, Robin</td>
<td>Please approve Bahamas</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outstanding</th>
<th>History</th>
</tr>
</thead>
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</tr>
<tr>
<td>Vargas, Audrey</td>
<td>Please approve C++ training</td>
</tr>
<tr>
<td>Powers, Salvatore</td>
<td>Please approve Sharepoint Training</td>
</tr>
<tr>
<td>French, Robin</td>
<td>Please approve Bahamas</td>
</tr>
</tbody>
</table>
Team Ford
Beta Presentation

Approve/Reject Details

Enter a comment for the approval

Sample approval text:

Outstanding

<table>
<thead>
<tr>
<th>Training Type:</th>
<th>Internal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Cost:</td>
<td>1.00000000000000</td>
</tr>
<tr>
<td>End Date:</td>
<td>2014-03-28 00:00:00</td>
</tr>
<tr>
<td>Funding:</td>
<td>ITLD Budget</td>
</tr>
<tr>
<td>Requestor Comments:</td>
<td>No way is it 1 $</td>
</tr>
<tr>
<td>Requestor Name:</td>
<td>Wheeler, Douglas</td>
</tr>
<tr>
<td>Manager:</td>
<td>Hayes, Margaret</td>
</tr>
<tr>
<td>Training Location:</td>
<td>U of M, Ann Arbor</td>
</tr>
<tr>
<td>ID:</td>
<td>148</td>
</tr>
<tr>
<td>Department:</td>
<td>AD</td>
</tr>
<tr>
<td>Start Date:</td>
<td>2014-03-21 00:00:00</td>
</tr>
<tr>
<td>Title:</td>
<td>Microsoft Excel Training</td>
</tr>
</tbody>
</table>

Approved/Reject

Approve  Reject  Back
Team Ford
Beta Presentation
QR Code Scanning

Material Name: Generic Material
Material Spec: WSS-M1A340-U1
UID: 125
Alpha Code: ABCAAAA
Part Name: FRONT END / VISOR
Part Number: DL8E-7403515-AAW
Supplier Code: CSE498
Title: Appearance Approval Report
Supplier Name: MSU Capstone Team
The Capstone Experience

Team GM
Project Overview

The Matrix: Vehicle Simulator System

• Functionalities
  ▪ Simulate Vehicles Moving Along a Route
  ▪ For Testing GM Location-Based Apps
  ▪ Accessible Via Web Service API

• Features
  ▪ Database of Vehicles
  ▪ RESTful Web Services
    o Create Vehicle
    o Route Vehicle Along Waypoints
  ▪ Discrete Timing Mechanism
    o Move Vehicle
    o Update Location-Based App
  ▪ Create and Handle Named Events (i.e., “Crash”)

• Technologies
  ▪ CSS / HTML / JavaScript
  ▪ Java / J2EE
  ▪ Java Web / Application Server
  ▪ Oracle Database
  ▪ Google Maps API

myChevrolet Mobile Phone App

Detroit, Michigan
Team GM
Duncan Young, Sam Moore, Matt Wein
using Matrix;

class MatrixClient
{
    public static void Main(string[] args)
    {
        Simulator.config("http://www.myserver.com", 80);

        Vehicle vehicle = Simulator.AddVehicle();
        vehicle.SetStartingLocation("East Lansing, MI 48823");
        vehicle.SetDestination("Tampa, FL 33602");

        LocationEvent event = new Simulator.LocationEvent();
        event.name = "Arrived at Destination";
        event.location = v1.GetDestination();
        event.callback = OnVehicleArrivedAtDestination;
        vehicle.SetEventForLocation(event);

        Simulator.Run();
    }

    public void OnVehicleArrivedAtDestination(EventData data)
    {
        Console.WriteLine("Vehicle arrived at destination: {0}", data.vehicle.GetName());
        data.vehicle.SetDestination("East Lansing MI, 48823");
    }
}
Team GM
Project Plan Presentation
Design Specifications - Client mockup

Team GM
Project Plan Presentation
Team GM
Alpha Presentation

```
RESTClient.Connect("http://35.9.22.109:8888/Matrix/");

Session session = new Session();
Vehicle vehicle = new Vehicle();
Vehicle vehicle2 = new Vehicle();
Vehicle vehicle3 = new Vehicle();
vehicle2._m_name = "Spark";
vehicle2._m_name = "Silverado";
vehicle3._m_name = "Corvette";

Event e = new Event();
e._vehicle = vehicle;
e._name = "Made it to my house in EL";
e._threshold = 0.5f;
e._locationName = "1921 Abbot Rd, East Lansing, MI";

e._callbacks += EventHit;
RESTClient.eventCallbacks.Add(e._id, e._callbacks);

session._m_events.Add(e);

Event e2 = new Event();
e2._vehicle = vehicle2;
e2._name = "Duncan picked up his lunch";
e2._threshold = 0.3f;
e2._locationName = "1840 Blanchette Dr, East Lansing, MI";

e2._callbacks += EventHit;
RESTClient.eventCallbacks.Add(e2._id, e2._callbacks);
```

Dictionary<

```
Dictionary<string, List<string>> waypoints = new Dictionary<string, List<string>>(){
    // Add waypoints here
};

List<string> wp = new List<string>(){
    "189 Spartan Ave, East Lansing, MI",
    "1921 Abbot Rd, East Lansing, MI",
    "1140 Blanchette Dr, East Lansing, MI"
};

waypoints.Add(vehicle, wp);
List<string> wp2 = new List<string>(){
    "1140 Blanchette Dr, East Lansing, MI",
    "1840 Blanchette Dr, East Lansing, MI",
    "4642 S Hagadorn Rd, East Lansing, MI"
};

waypoints.Add(vehicle2, wp2);
List<string> wp3 = new List<string>(){
    "4642 S Hagadorn Rd, East Lansing, MI",
    "189 Spartan Ave, East Lansing, MI",
    "1921 Abbot Rd, East Lansing, MI"
};

waypoints.Add(vehicle3, wp3);
```

SessionWrapper wrapper = new SessionWrapper();
wrapper.session = session;
wrapper.waypoints = waypoints;
```

delCar(vehicle);
delCar(vehicle2);
delCar(vehicle3);
```
```
Id = simulatorClient.CreateSession(wrapper);
RESTClient.ConnectCallback += Update;
RESTClient.SessionComplete += onSessionEnded;
```
Team GM
Beta Presentation
Monitoring Vehicle Properties

MATRIX
Vehicle Simulation

John
Make - ATS

Fuel

- Check to receive alerts when John enters a bad weather zone
- Check to receive alerts when John enters an area with high crime rate.

0:31 / 5:00
Team GM
Beta Presentation
Google’s mission is to organize the world’s information and make it universally accessible and useful.
Change Management Software

- **Functionalities**
  - Provide Change Management System
  - Built “Google on Google”
  - (Replace Legacy System)

- **Features**
  - Underlying Data/Document Model
  - HTTP-Based API
    (Create, Read, Modify and Change Requests)
  - Browser-Base User Interface
    (Create, View, Edit, Review and Discard Requests)

- **Technologies**
  - CSS / HTML
  - JavaScript
  - Google App Engine
  - Python or Go
Team Google
Nick Vogt, Ben Bonnen, Albert Guo
### New Change Request

<table>
<thead>
<tr>
<th>Title</th>
<th>Technician</th>
<th>Date Submitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failover license services to Atlanta</td>
<td>antarus</td>
<td>2014/10/1</td>
</tr>
<tr>
<td>Failover license services to Atlanta</td>
<td>antarus</td>
<td>2014/10/1</td>
</tr>
<tr>
<td>Yet more happening in Atlanta</td>
<td>antarus</td>
<td>2014/10/1</td>
</tr>
<tr>
<td>Upgrading servers in Atlanta</td>
<td>antarus</td>
<td>2014/10/1</td>
</tr>
<tr>
<td>Something about Atlanta</td>
<td>antarus</td>
<td>2014/10/1</td>
</tr>
</tbody>
</table>

**Screen Mockup**
## Current Change Requests

<table>
<thead>
<tr>
<th>Created On</th>
<th>Technician</th>
<th>Summary</th>
<th>Priority</th>
<th>Start Time</th>
<th>End Time</th>
<th>ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb 16 2014, 15:14</td>
<td><a href="mailto:a@gmail.com">a@gmail.com</a></td>
<td>hello</td>
<td>routine</td>
<td>Feb 20 2014, 16:24</td>
<td>Feb 20 2014, 16:34</td>
<td>ahRzfmNocm9tYXR...</td>
</tr>
<tr>
<td>Feb 16 2014, 15:03</td>
<td>bgilmore</td>
<td>Greetings, traveller</td>
<td>sensitive</td>
<td>Dec 31 1969, 19:00</td>
<td>Dec 31 1969, 19:00</td>
<td>ahRzfmNocm9tYXR...</td>
</tr>
<tr>
<td>Feb 16 2014, 15:03</td>
<td>nick</td>
<td>Heh, greetings</td>
<td>routine</td>
<td>Dec 31 1969, 19:00</td>
<td>Dec 31 1969, 19:00</td>
<td>ahRzfmNocm9tYXR...</td>
</tr>
<tr>
<td>Feb 16 2014, 15:03</td>
<td>nick</td>
<td>Greetings</td>
<td>routine</td>
<td>Dec 31 1969, 19:00</td>
<td>Dec 31 1969, 19:00</td>
<td>ahRzfmNocm9tYXR...</td>
</tr>
<tr>
<td>Feb 16 2014, 15:03</td>
<td>albert</td>
<td>Greetings</td>
<td>sensitive</td>
<td>Dec 31 1969, 19:00</td>
<td>Dec 31 1969, 19:00</td>
<td>ahRzfmNocm9tYXR...</td>
</tr>
<tr>
<td>Feb 16 2014, 15:03</td>
<td>albert</td>
<td>Greetings, traveller</td>
<td>sensitive</td>
<td>Dec 31 1969, 19:00</td>
<td>Dec 31 1969, 19:00</td>
<td>ahRzfmNocm9tYXR...</td>
</tr>
<tr>
<td>Feb 16 2014, 15:03</td>
<td>albert</td>
<td>Greetings</td>
<td>sensitive</td>
<td>Dec 31 1969, 19:00</td>
<td>Dec 31 1969, 19:00</td>
<td>ahRzfmNocm9tYXR...</td>
</tr>
</tbody>
</table>

Selected items: 0
Edit Change Request

Summary: hello

Technician: a@gmail.com

Description:

Impact:

Documentation:
## Team Google

### Beta Presentation

**Main View**

![Main View of Change Management System]

A screenshot of the Change Management system interface, which includes:

- **Change Requests** tab with options for My Drafts, Awaiting Approval, Recently Approved, and Templates.
- **Advanced** section with columns for Created On, Technician, Summary, Priority, Start Time, End Time, Status, and ID.

<table>
<thead>
<tr>
<th>Created On</th>
<th>Technician</th>
<th>Summary</th>
<th>Priority</th>
<th>Start Time</th>
<th>End Time</th>
<th>Status</th>
<th>ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug 02 2013, 15:00</td>
<td><a href="mailto:anterus@google.com">anterus@google.com</a></td>
<td>Routine switch maint...</td>
<td>routine</td>
<td>Aug 05 2013, 10:00</td>
<td>Aug 05 2013, 18:30</td>
<td>approved</td>
<td>92</td>
</tr>
<tr>
<td>Feb 09 2014, 23:00</td>
<td><a href="mailto:kueiving@google.com">kueiving@google.com</a></td>
<td>Switch maintenance</td>
<td>routine</td>
<td>Feb 17 2014, 10:00</td>
<td>Feb 19 2014, 11:30</td>
<td>approved</td>
<td>84</td>
</tr>
<tr>
<td>Jan 27 2014, 18:00</td>
<td><a href="mailto:ben@google.com">ben@google.com</a></td>
<td>Server update</td>
<td>routine</td>
<td>Feb 03 2014, 14:00</td>
<td>Feb 04 2014, 17:00</td>
<td>approved</td>
<td>74</td>
</tr>
<tr>
<td>Jul 04 2013, 09:30</td>
<td><a href="mailto:bgilmore@google.com">bgilmore@google.com</a></td>
<td>Server update</td>
<td>routine</td>
<td>Jul 11 2013, 00:30</td>
<td>Jul 12 2013, 01:30</td>
<td>approved</td>
<td>81</td>
</tr>
<tr>
<td>Jul 31 2013, 11:30</td>
<td><a href="mailto:albert@google.com">albert@google.com</a></td>
<td>Database restructuring</td>
<td>routine</td>
<td>Aug 13 2013, 01:30</td>
<td>Aug 13 2013, 06:30</td>
<td>approved</td>
<td>95</td>
</tr>
<tr>
<td>Jun 25 2013, 12:00</td>
<td><a href="mailto:bgilmore@google.com">bgilmore@google.com</a></td>
<td>Server update</td>
<td>routine</td>
<td>Jul 02 2013, 16:00</td>
<td>Jul 03 2013, 13:00</td>
<td>approved</td>
<td>86</td>
</tr>
<tr>
<td>Mar 13 2014, 16:18</td>
<td><a href="mailto:guoaber1@gmail.com">guoaber1@gmail.com</a></td>
<td>hello</td>
<td>routine</td>
<td>Mar 13 2014, 18:00</td>
<td>Mar 21 2014, 04:00</td>
<td>created</td>
<td>380001</td>
</tr>
<tr>
<td>Mar 18 2014, 16:05</td>
<td><a href="mailto:guoaber1@gmail.com">guoaber1@gmail.com</a></td>
<td>routine</td>
<td>Mar 18 2014, 10:00</td>
<td>Mar 18 2014, 10:00</td>
<td>approved</td>
<td>450002</td>
<td></td>
</tr>
<tr>
<td>Nov 08 2013, 16:00</td>
<td><a href="mailto:anterus@google.com">anterus@google.com</a></td>
<td>Database restructuring</td>
<td>routine</td>
<td>Nov 11 2013, 09:00</td>
<td>Nov 13 2013, 09:00</td>
<td>approved</td>
<td>76</td>
</tr>
<tr>
<td>Oct 23 2013, 14:30</td>
<td><a href="mailto:kueiving@google.com">kueiving@google.com</a></td>
<td>Server update</td>
<td>routine</td>
<td>Nov 07 2013, 00:30</td>
<td>Nov 08 2013, 01:30</td>
<td>approved</td>
<td>83</td>
</tr>
</tbody>
</table>

**Selected Items:** 9
**Showing Results:** 1-10
Team Google
Beta Presentation

Create Change Request

The Capstone Experience
Team Google
Beta Presentation
Team Google
Beta Presentation

Advanced Search

[Image of a web interface for an advanced search engine, showing various search fields such as GLOBAL, summary, technician, priority, tags, and start time. The interface includes options for sorting by created date in descending order.]
The Capstone Experience

Team Meijer

Department of Computer Science and Engineering
Michigan State University
Spring 2014
Team Meijer
Project Overview

Mobile Customer Satisfaction App

• Functionalities
  ▪ Provide Feedback About Shopping Experience
  ▪ By Customers
  ▪ Quickly and Easily
  ▪ Via Mobile Devices

• Features
  ▪ Support Tablets and Smartphones
  ▪ Use Cloud-Based Data Storage
  ▪ Is Secure
  ▪ Provide Web-Based Corporate User Interface

• Technologies
  ▪ CSS / HTML5
  ▪ Microsoft Azure Services
  ▪ Mobile Development Methodologies
  ▪ Social Media
Team Meijer
Taylor Jones, Kaleb Friskey, Noor Hanan Ahmadkamel
Team Meijer
Project Plan Presentation

Screen Mockups
Team Meijer
Project Plan Presentation

Architectural Diagram:

- Mobile App
  - Handle information and update databases

- Microsoft Azure Cloud Database
  - Access and update databases
  - Meijer WebServices - Store Lookup

- Meijer Corporate Datacenter

- Customer Service Website
Team Meijer
Project Plan Presentation

Screen Mockups

Meijer Customer Service

Issues

- Can't find product
- Product out of stock
- Aisle spill
- Dirty bathroom
- Self checkout difficulties
- Long register lines

Other

[ ]

Submit

FAQ

Question: text
Answer: text
Question: text
Answer: text

.
Team Meijer Alpha Presentation
Team Meijer
Alpha Presentation

Survey and Issues

Survey

How would you rate your overall satisfaction with your shopping experience?
- Unsatisfied
- Average
- Satisfied

How would you rate the overall freshness of the products you purchased?
- Unsatisfied
- Average
- Satisfied

How would you rate the overall friendliness of the employees you interacted with?
- Unsatisfied
- Average
- Satisfied

How would you rate the overall cleanliness of the Meijer you visited?
- Unsatisfied
- Average
- Satisfied

Did you find the products you were looking for?
- Unsatisfied
- Average
- Satisfied

Submit

Issues

- Product out of stock
- Aisle spill
- Dirty bathroom
- Self checkout difficulties
- Long register lines

Other

Submit
FAQ

How should I report an urgent Customer Service concern?
You may talk with any Meijer team member. In addition, the names of the Manager-in-Charge is posted at the Service Desk.

How can I recognize a Meijer team member that has been particularly helpful?
You may speak to a manager in the store. We also have a Contact Us section on the Meijer.com website.

How do I return an item purchased on Meijer.com?
You may return the item, without charge, to a Meijer store. You can also return the item via carrier.
<table>
<thead>
<tr>
<th>Action</th>
<th>Issue ID</th>
<th>Store Number</th>
<th>Messy Aisle</th>
<th>Dirty Bathroom</th>
<th>Long Register Lines</th>
<th>Self Checkout</th>
<th>Out Of Stock</th>
<th>Other</th>
<th>Severity</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>East</td>
<td>9</td>
<td>517</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Open</td>
</tr>
<tr>
<td>East</td>
<td>1010</td>
<td>517</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>Open</td>
</tr>
<tr>
<td>East</td>
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<td>0</td>
<td>1</td>
<td>0</td>
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<td>1</td>
<td>0</td>
<td>Open</td>
</tr>
<tr>
<td>East</td>
<td>1029</td>
<td>517</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>Open</td>
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<td>517</td>
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<td>0</td>
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<td>1</td>
<td>0</td>
<td>Open</td>
</tr>
<tr>
<td>East</td>
<td>1059</td>
<td>517</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>Open</td>
</tr>
<tr>
<td>East</td>
<td>5</td>
<td>577</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>In Progress</td>
</tr>
<tr>
<td>East</td>
<td>7</td>
<td>517</td>
<td>0</td>
<td>0</td>
<td>1</td>
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<td>In Progress</td>
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<td>0</td>
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<td>In Progress</td>
</tr>
<tr>
<td>East</td>
<td>6</td>
<td>543</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>Closed</td>
</tr>
<tr>
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<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Closed</td>
</tr>
</tbody>
</table>
Team Meijer
Beta Presentation
Team Meijer
Beta Presentation

Landing Page and Menu

Customer Satisfaction

5 Question Survey
Find My Store
Submit Issue
FAQ

Customer Satisfaction

How should I reach Meijer Customer Service?

You may talk with a Meijer team member. In addition, use our Manager-in-Charge, Service Desk.

How can I recognize a Meijer team member that has been particularly helpful?

You may speak to a manager in the store. We also have a Contact Us section on the Meijer.com website.

How do I return an item purchased on Meijer.com?

You may return the item, without charge, to a Meijer store. You can also return the item via carrier. Additional details can be found at Meijer.com.

How do I redeem my mPerks coupons?
Team Meijer
Beta Presentation

Survey Page

5 Question Survey
How would you rate your overall satisfaction with your shopping experience?
- Very Satisfied
- Satisfied
- Average
- Unsatisfied
- Very Unsatisfied

Is this the store that the survey is associated with?
- No
- Yes

How would you rate your satisfaction of the overall freshness of the products you purchased?
- Very Satisfied
- Satisfied
- Average
- Unsatisfied
- Very Unsatisfied

How would you rate your satisfaction of the overall freshness of the products you purchased?
- Very Satisfied
- Satisfied
- Average
- Unsatisfied
- Very Unsatisfied

How would you rate your satisfaction of the ease and availability in the products you were looking for?
- Very Satisfied
- Satisfied
- Average
- Unsatisfied
- Very Unsatisfied
Team Meijer
Beta Presentation
### List All Issues

You can sort the issues by the following criteria:
- Stores Ranking
- Find a Specific Store
- List All Surveys
- List All Issues

#### Details

**Click on Issue ID to get the issuer details.**
**Click on Action to edit status, severity, and actions taken.**

<table>
<thead>
<tr>
<th>Action</th>
<th>Issue ID</th>
<th>Store Number</th>
<th>Messy Aisle</th>
<th>Dirty Bathroom</th>
<th>Long Register Lines</th>
<th>Self Checkout</th>
<th>Out Of Stock</th>
<th>Other (click for details)</th>
<th>Severity</th>
<th>Status</th>
<th>Actions Taken</th>
<th>Images</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edit</td>
<td>4107</td>
<td>52</td>
<td>F</td>
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<td>F</td>
<td>F</td>
<td>F</td>
<td>True</td>
<td>Low</td>
<td>Open</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edit</td>
<td>4108</td>
<td>52</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>Low</td>
<td>Open</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edit</td>
<td>4109</td>
<td>52</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>Low</td>
<td>Open</td>
<td></td>
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<tr>
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<td>F</td>
<td>F</td>
<td>F</td>
<td>Low</td>
<td>Open</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Capstone Experience

Team MSUFCU

Department of Computer Science and Engineering
Michigan State University
Spring 2014
MSU Federal Credit Union

Personal | Business | Account Services | Join MSUFCU

V.me by Visa is here.

It's the free virtual wallet that is secure, personal, and simple.

What's New @ MSUFCU

Parents - Our Financially Made Contest is back!
New educational Money.edu app is available
Simplify your finances with MSUFCU's Bill Payment

Upcoming Events

MSUFCU Day at MSU Women's Volleyball
Friday, November 22

View all events

Current Rates

Loans | Home Loans | Savings | Business

MSUFCU Routing Number: 272479663
MSUFCU SWIFT Code: MSUCUS44

ComputerLine - Protected by TrulyU®

Base Account #
Password
Request Password
Login

Search Site or Find ATMs by City, State or Zip

MSUFCU ID Sign In

Online Chat is currently unavailable
Send Us a Secure Email

800-678-4968 • 517-333-2424
Mon-Fri: 7:00 a.m. - 9:00 p.m. ET
Sat: 9:00 a.m. - 3:00 p.m. ET

Facebook • Twitter • Instagram • LinkedIn • YouTube
Mobile Financial Education App

• Functionalities
  ▪ Provide Financial Educational Tools and Resources
  ▪ For University Students
  ▪ Via Mobile Devices

• Features
  ▪ Support both iPhone, iPad and Android Devices
  ▪ Cover Various Topics
    ◦ Budgeting
    ◦ Building Savings and Credit
    ◦ Protection from Identity Theft and Fraud
  ▪ Glossary of Terms
  ▪ Financial Calculator
  ▪ Ask an Expert

• Technologies
  ▪ CSS / HTML / PHP / JavaScript
  ▪ Android Development / Java
  ▪ iPhone and iPad Development / Objective-C
  ▪ Microsoft SQL Server
Team MSUFCU
Drew Dakin, Jenny Manning, Kyle Ladd
Team MSUFCU
Project Plan Presentation

Screen Mockups

- What's credit?
  Credit is borrowed money used to purchase things when you need them.

- Quick tips
  • Many credit cards offer grace periods during which you may pay your balance without interest.

- Calculators
  - Credit Card Calculator
  - Loan Calculator
  - Credit Card Calculator 2

- Budgets and saving
  Placeholer for budget info/tracker summary

- Quick tips
  • Pay yourself first
  • Consider opening a CD
  • Set up an automatic transfer
Team MSUFCU
Project Plan Presentation  Architecture Diagram

MSUFCU

Windows Server

Microsoft SQL Database

Content entry

Content served

Request update

Mobile Application

Local Database

Deliver content

Enlightened College Student
Team MSUFCU
Project Plan Presentation
Screen Mockups
Team MSUFCU
Alpha Presentation
Team MSUFCU
Alpha Presentation

Navigation Drawer

Android

iOS
Revolving credit
(credit cards): you are given a maximum credit limit and every month you need to make a payment toward the balance or amount spent.

Charge cards
You must pay the total balance every month.

Service credit
Arrangements made with service providers such as electricity, cellular phone service, etc., and you make payments each month.

Installment credit
(auto loan, mortgage): you are loaned a specific amount of money and agree to pay back the money with interest in set installments over
Revolving credit
(credit cards): you are given a maximum credit limit and every month you need to make a payment toward the balance or amount spent

Charge cards
You must pay the total balance every month

Service credit
Arrangements made with service providers such as electricity, cellular phone service, etc., and you make payments each month.

Installment credit
(auto loan, mortgage): you are loaned a specific amount of money and agree to pay back the money with interest in set installments over
Team MSUFCU
Beta Presentation

Navigations Drawer

Android

iOS

[Diagram showing a mobile application interface with options such as Credit, All About Credit Cards, Budget, Travel, Fraud, All About Loans, International Students, Ask an Expert, Calculators, etc.]
Team MSUFCU
Beta Presentation

Tools: Ask An Expert

Android

iOS
Team MSUFCU
Beta Presentation
Team MSUFCU
Beta Presentation

Tools: Glossary

Android

iOS

Asset

Annual Percentage Rate (APR) is the one-year rate charged for borrowing money. It is expressed as a percentage and commonly used to compare rates from other financial institutions. By law, lenders must show the APR to provide clear understanding of the actual rates applied to the loans.

Annual Percentage Yield (APY)

Automated Teller Machine (ATM)
The Capstone Experience

Team Quicken Loans
Department of Computer Science and Engineering
Michigan State University
Spring 2014
You Could Close Your Loan IN 30 DAYS!

Get started, and get saving

Refinance  Buy a Home
Mobile RFID Inventory Tracking System

• Functionalities
  ▪ Monitor and Track Mobile Test Device Inventory
  ▪ Used by QL's Mobile Application Development Team
  ▪ Based On RFID Tags

• Features
  ▪ Snapshot of Device Inventory
    o Checked Into Mobile Devices Cabinet
    o Checked Out to Developers
  ▪ Authenticate and Track Users
  ▪ Provide Website with Information on All Devices
  ▪ Produce Detailed Reports
  ▪ Send Email to Users

• Technologies
  ▪ Impinj Speedway
    o R420 RFID Reader
    o Connect RFID Management Software
  ▪ RFIDeas RDR-6081AKU NFC Badge Reader
  ▪ .Net Integration
    o With RFID Hardware
    o Into Database
  ▪ Microsoft SQL Server
Team Quicken Loans
Jacob Riesser, Josh Rasor, K.P. Patel
<table>
<thead>
<tr>
<th>RFID Tag Number</th>
<th>Device Type</th>
<th>Device Manufacturer</th>
<th>Device Name</th>
<th>Device OS</th>
<th>OS Version</th>
<th>Is checked out?</th>
<th>Check-in Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>123456789</td>
<td>iPad</td>
<td>Apple</td>
<td>TestiPad</td>
<td>iOS</td>
<td>5.0.1</td>
<td>No</td>
<td>1/2/3456 7:59 PM</td>
</tr>
<tr>
<td>1111111111</td>
<td>Galaxy S3</td>
<td>Samsung</td>
<td>TesterPhone</td>
<td>Android</td>
<td>3.14</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Badge No.</td>
<td>User ID</td>
<td>First Name</td>
<td>Last Name</td>
<td>Extension</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12345</td>
<td>usr_ID</td>
<td>Tester</td>
<td>Tester</td>
<td>#28718</td>
<td></td>
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</tr>
<tr>
<td>987654321</td>
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<td>Apple</td>
<td>PhoneYTest</td>
<td>iOS</td>
<td>4.0.2.1</td>
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<td>2/5/2012 3:22 PM</td>
</tr>
<tr>
<td>192837465</td>
<td>Windows Surf.</td>
<td>Microsoft</td>
<td>TesterTablet</td>
<td>Windows 8</td>
<td>2.43</td>
<td>No</td>
<td>5/10/2013 9:01 AM</td>
</tr>
</tbody>
</table>

Get Device History
Get Device History
Get Device History
Get User History
Team Quicken Loans
Project Plan Presentation  Architecture Diagram

- SQL Server
- Web Services Web API 2.0
- Web Application .NET MVC
- RFIDEas Badge Scanner
- Locking Device
- Mobile Device Cabinet
- RFID Reader Speedway Revolution R420
System Components

- Hardware Platforms
  - Windows Server 2008 equipped with Microsoft SQL database 2014
  - Speedway Revolution R420 RFID reader
- Software Platforms / Technologies
  - Speedway Connect middleware
  - ASP.NET MVC, Web API 2.0
  - Microsoft SQL database
### User History for Tester Tester

<table>
<thead>
<tr>
<th>RFID Tag Number</th>
<th>Device Type</th>
<th>Device Manufacturer</th>
<th>Device Name</th>
<th>Device OS</th>
<th>OS Version</th>
<th>Check in - check out</th>
</tr>
</thead>
<tbody>
<tr>
<td>123456789</td>
<td>iPad</td>
<td>Apple</td>
<td>TestiPad</td>
<td>iOS</td>
<td>5.0.1</td>
<td>1/2/3456 7:09 PM - 1/4/3456 1:00 PM</td>
</tr>
<tr>
<td>987654321</td>
<td>iPhone</td>
<td>Apple</td>
<td>PhoneTest</td>
<td>iOS</td>
<td>4.0.2.1</td>
<td>2/5/2012 3:22 PM - 2/19/2012 3:21 PM</td>
</tr>
<tr>
<td>192837465</td>
<td>Windows Surf.</td>
<td>Microsoft</td>
<td>TesterTablet</td>
<td>Windows 8</td>
<td>2.43</td>
<td>5/10/2014 9:01 AM - current</td>
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</table>

Get Device History
### Current Device Inventory

<table>
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<tr>
<th>RFID Tag Number</th>
<th>Type</th>
<th>Manufacturer</th>
<th>Name</th>
<th>OS</th>
<th>OS Version</th>
<th>Checked Out?</th>
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</thead>
<tbody>
<tr>
<td>1234</td>
<td>2</td>
<td>Apple</td>
<td>Internal App Tester</td>
<td>iOS</td>
<td>6.0</td>
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<tr>
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<td>1</td>
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<td>Tester Phone</td>
<td>iOS</td>
<td>7.0</td>
<td>✓</td>
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<tr>
<td>7576</td>
<td>4</td>
<td>Nokia</td>
<td>Stress Tester</td>
<td>Android</td>
<td>4.0</td>
<td>✓</td>
</tr>
<tr>
<td>9876</td>
<td>3</td>
<td>Samsung</td>
<td>App Compatibility Tester</td>
<td>Android</td>
<td>4.4</td>
<td>✓</td>
</tr>
</tbody>
</table>

Showing 1 to 4 of 4 entries
Team Quicken Loans
Alpha Presentation

RFID Scanner
Welcome to Team Quicken Loans Alpha Presentation.
Team Quicken Loans
Alpha Presentation

Badge Scanner

Waiting for scanned badge...
27273
Scanned user with ID 27273
Authenticated user Josh Rasor. with ID 27273
Waiting for scanned badge...

30328
Scanned user with ID 30328
Authenticated user Jacob Riesser. with ID 30328
Waiting for scanned badge...

515674
Scanned user with ID 515674
Could not retrieve from API with error message:Response status code does not indicate success: 404 (Not Found).
Waiting for scanned badge...
notavlidID
Invalid ID.
Waiting for scanned badge...
Team Quicken Loans
Beta Presentation

RFID Tracking System

Scanned user with ID 4096
Authenticated user Keyur Patel, with ID 4096
Snapshotting device inventory...

- Host Name: speedwayr-10-c4-2d.local
- Port: 14150
- Timeout: 3
- API URL: http://35.9.22.101:8080/RFIDAPI/a5
- AD URL: http://35.9.22.101:8080/RFIDAPI/a5

Open
Save
## Device Information

<table>
<thead>
<tr>
<th>Device Name</th>
<th>Checked Out?</th>
<th>RFID Tag Number</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows Tester</td>
<td>False</td>
<td>91</td>
<td>Microsoft Windows 8.0</td>
</tr>
</tbody>
</table>

## Device History

<table>
<thead>
<tr>
<th>Full Name</th>
<th>Username</th>
<th>Check Out Time</th>
<th>Check In Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rasor, Josh</td>
<td>QLAD:Josh</td>
<td>3/14/2014 12:00:00 AM</td>
<td>3/18/2014 12:00:00 AM</td>
</tr>
</tbody>
</table>

The Capstone Experience
Team Quicken Loans
Beta Presentation

Add Device/CRUD Operations
Team Quicken Loans Design Day
The Capstone Experience

Team Spectrum Health

Department of Computer Science and Engineering
Michigan State University
Spring 2014
Medications Shortages Dashboard

**Functionalities**
- Manage Shortages of Key Medication
- By Pharmacists
- Chose Best Course of Action
  - Weather the Shortage
  - Seek Additional Stock from the Grey Market
  - Swap the Medication for an Alternative

**Features**
- Create Comprehensive View of Industry Shortages
  - XML/RSS Feeds
    - ASHP (American Society of Hospital Pharmacists)
    - FDA (Food and Drug Administration)
  - Formulary and Inventory Information from Pyxis and Talyst
  - Spectrum Pharmacies and Store Rooms
- Identify and Handle Specific Shortages
  - Record, Monitor and Track
  - Log Comments, Plans of Action and Status

**Technologies**
- CSS / HTML5
- JavaScript / AngularJS
- ASP.net MVC
- Microsoft Internet Information Services (IIS) 7.0
- Microsoft SQL Server
- REST Service Layer
- Medication Shortages Dashboard, Fall 2012
Team Spectrum Health
Cam Keif, Alexander Lockwood, Alex Seling
Team Spectrum Health
Alexander Lockwood, Alex Seling, Cam Keif
### Spectrum Health

#### Screen Mockup

**Watchlist**

<table>
<thead>
<tr>
<th>Name</th>
<th>Dosage</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug E</td>
<td>1 mg</td>
<td>out</td>
</tr>
<tr>
<td>Drug C</td>
<td>2.0 mg</td>
<td>warning</td>
</tr>
<tr>
<td>Drug A</td>
<td>2.0 mg</td>
<td>good</td>
</tr>
</tbody>
</table>

**Medication Shortages Dashboard**

http://www.spectrumhealthcapstone.com

**Username**

Settings | Layout

The Capstone Experience
Team Spectrum Health
Project Plan Presentation

Screen Mockup
Team Spectrum Health
Alpha Presentation
Team Spectrum Health
Alpha Presentation

ASHP Feed Processing

Team Spectrum Health
Alpha Presentation

MS SQL Server Interactions

The Capstone Experience
Team Spectrum Health
Alpha Presentation
Welcome to ASP.NET Web API! Modify the code in this template to jump-start your ASP.NET Web API development.

ASP.NET Web API allows you to expose your applications, data and services to the web directly over HTTP.

To learn more about ASP.NET Web API visit the ASP.NET Web API Website. The page features videos, tutorials, and samples to help you get the most from ASP.NET Web API. If you have any questions about ASP.NET Web API, visit our forums.

We suggest the following steps:
Team Spectrum Health
Beta Presentation

Current Shortages

[Screenshot of a website displaying current shortages in medications. The page lists medications in three categories: Severe, Warning, and Good. The medications include Captopril 750mg, Etipros 667mg, Arazola 50mg, and Telplots 200mg, among others.]
Team Spectrum Health
Beta Presentation

Medication Details

APP Leucovorin Calcium Injection
Dosage: 200 mg
NDC: 63323-0710-50
Generic Name: Leucovorin Calcium Injection
Current Status: Warning

Create Shortage

Shortage History

The Capstone Experience
Team Spectrum Health
Beta Presentation
### Create Shortage

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDC</td>
<td>5</td>
</tr>
<tr>
<td>Status</td>
<td>55390-0226-04</td>
</tr>
<tr>
<td>Severity</td>
<td>Good</td>
</tr>
<tr>
<td>Seven day usage</td>
<td></td>
</tr>
<tr>
<td>Migration Actions</td>
<td></td>
</tr>
</tbody>
</table>

**Reason for the Shortage**
- **Amikacin** injection, Bedford
- 250 mg/mL, 4 mL vials, package of 10 (NDC 55390-0226-04)
- **Ben Venue** has **stopped production in its plant in Bedford, Ohio** and will close its manufacturing operations
- Supplies of Amikacin have been reduced from a number of products manufactured elsewhere that are not affected by this closure
- **Hospira** discontinued Amikacin in May, 2010 due to a raw material shortage
- **Teva’s** product was unavailable due to manufacturing delays
- **Sandoz** discontinued Amikacin in 2006
- **Heritage** launched Amikacin injection in March 2014

[View Full Report]

- Create_shortage
- Bumetanide injection
- Secretin injection
The Capstone Experience

Team TechSmith

Department of Computer Science and Engineering
Michigan State University
Spring 2014
Helping you work, wherever you are

TechSmith helps you solve everyday problems with ease. Whether you’re trying to explain something over email or keep your students’ attention, TechSmith can help you work faster and smarter.

WATCH NOW
ClassView

• Functionalities
  - Dashboard View of Google Drive
  - For Teachers and Students
  - Via Chrome App

• Features
  - Models the Classroom
    - Helps with Content Management
    - Facilitates Assignments and Collaboration
  - Teacher Dashboard and Student Dashboard
  - Notifications for Key Events
    - Assignment Posted
    - Assignment Due
  - Assignment “Progress” Mechanism
  - Provide Usage Statistics

• Technologies
  - CSS / HTML5 / JavaScript
  - Chrome App APIs
  - Google Drive SDK
  - Google Analytics
Team TechSmith
Eric Austin, Rebecca Collins, Kyle Woodward
# ClassView

## Files

<table>
<thead>
<tr>
<th>Title</th>
<th>Owner</th>
<th>Last Modified</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 1 Homework</td>
<td>me</td>
<td>10:17 pm</td>
<td>50%</td>
</tr>
<tr>
<td>Class Notes</td>
<td>me</td>
<td>10:16 pm</td>
<td></td>
</tr>
<tr>
<td>Notes</td>
<td>me</td>
<td>10:16 pm</td>
<td></td>
</tr>
</tbody>
</table>

**Screen Mockup**

Team TechSmith

Project Plan Presentation
Team TechSmith
Project Plan Presentation  Architecture Diagram

ClassView App

Google APIs

Users

AngularJS, HTML, etc.

Google Drive Data
System Architecture

ClassView App

Google APIs

Users

AngularJS, HTML

Data

SDks

Team TechSmith
Project Plan Presentation
Team TechSmith
Project Plan Presentation
Screen Mockups

Class1 Class2 Class3 Add New

Class Name: Class4
Student: George Smith
Group: C Team

A Team | B Team
Billy Bob Joe Bob | ✓
Student2 | 
Stormageddon | ✓

Groups

Manage
Save

The Capstone Experience
Team TechSmith Beta Presentation
Team TechSmith
Beta Presentation
Teacher Sharing with Class
Welcome, Dr. Dyksen!

**Science**

- Eric Austin
  - File Name: New Deal
    - Completed: Yes
    - Help Needed: No
    - Last Date Modified: 3/29/14
  - Greek Civilizations
    - Completed: Yes
    - Help Needed: No
    - Last Date Modified: 3/29/14
  - Civil War and Reconstruction
    - Completed: Yes
    - Help Needed: No
    - Last Date Modified: 3/29/14
  - The Great Depression
    - Completed: Yes
    - Help Needed: No
    - Last Date Modified: 3/29/14

- Rebecca Collins
  - File Name: The Great Depression
    - Completed: Yes
    - Help Needed: No
    - Last Date Modified: 3/29/14
  - Civil War and Reconstruction
    - Completed: Yes
    - Help Needed: No
    - Last Date Modified: 3/29/14
  - New Deal
    - Completed: Yes
    - Help Needed: No
    - Last Date Modified: 3/29/14
  - Greek Civilizations
    - Completed: Yes
    - Help Needed: No
    - Last Date Modified: 3/29/14

- Kyle Woodward
  - File Name: New Deal
    - Completed: Yes
    - Help Needed: No
    - Last Date Modified: 3/29/14
  - Civil War and Reconstruction
    - Completed: Yes
    - Help Needed: No
    - Last Date Modified: 3/29/14
  - The Great Depression
    - Completed: Yes
    - Help Needed: No
    - Last Date Modified: 3/29/14
  - Greek Civilizations
    - Completed: Yes
    - Help Needed: No
    - Last Date Modified: 3/29/14
The Capstone Experience

Team Urban Science

Department of Computer Science and Engineering
Michigan State University
Spring 2014
Team Urban Science
Project Overview

Dealer Improvement Recommender System

• Functionalities
  ▪ Recommendation System for Automobile Dealerships
  ▪ Based On Weighted Expected Outcomes
  ▪ For Use by Urban Science Consultants

• Features
  ▪ Native iPad App
  ▪ Create, Edit, Delete and Visualize
    o Expected Outcomes
    o Weights
    o Relationships Between Outcomes
  ▪ Integrated with Dealership Performance Data

• Technologies
  ▪ iPad Development / Objective-C
  ▪ Web Development
  ▪ Visualization Libraries
  ▪ Web Services
  ▪ SQL Server
Team Urban Science
Ben Mastay, Collin Myers, Ty Jones
Team Urban Science
Project Plan Presentation

Screen Mockups
Team Urban Science
Project Plan Presentation

Architecture Diagram

App Server

Logic Tree Editor

ASP.NET MVC

RESTful Web API

Entity Framework

SQL Server

Dealer Assistant App
Team Urban Science
Project Plan Presentation
Team Urban Science
Project Plan Presentation
Screen Mockup

Urban Science Dealer Recommendations Control Panel
https://drc.urbanscience.com/hub/

New Vehicle  Used Vehicle  Body Shop  Service  Parts

KPIs

Return
Suggestions

Cause One  Cause Two  Cause Three  Cause Four  Cause Five
Cause Six  Cause Seven  Cause Eight  Cause Nine
Cause Ten  Cause Eleven  Cause Twelve  Cause Thirteen  Cause Fourteen
# The Capstone Experience

## Alpha Presentation

### KPI View

![KPI View](image-url)

<table>
<thead>
<tr>
<th>Name</th>
<th>Definition</th>
<th>Standard</th>
<th>Formula</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ty Jones</td>
<td>Ty is awesome!</td>
<td>A standard!</td>
<td>(e^{(x^2+1)}+1=0)</td>
<td>Team Urban Science</td>
</tr>
<tr>
<td>Ben Mason</td>
<td>Ben is awesome!</td>
<td>A standard!</td>
<td>(e^{2x}+2x=e^2)</td>
<td>Team Urban Science</td>
</tr>
<tr>
<td>Colin Myers</td>
<td>Colin is awesome!</td>
<td>A standard!</td>
<td>(\sin(B)^2 + \cos(B)^2 = 1)</td>
<td>Team Urban Science</td>
</tr>
</tbody>
</table>
Team Urban Science
Alpha Presentation

Logic Tree Visualization

The Capstone Experience
Team Urban Science
Beta Presentation

Node Browse View
Team Urban Science
Beta Presentation

Overview Visualization
Team Urban Science
Beta Presentation

KPI Suggestions

- Advertise
- Trading capacity analysis (what is selling in market vs. dealership);
- Review ROs for proper costing - internal, customer pay, warranty. Review all unapplied time & ensure

Reaction Comments

Comments on dealer reaction

Dealer Reaction

Negative

Not Convinced
Team Urban Science
Design Day
The Capstone Experience

Team Whirlpool

Department of Computer Science and Engineering
Michigan State University
Spring 2014
True innovation takes the complexity out.

The Whirlpool Dishwasher uses Sensor Cycle to automatically select the right wash and dry settings.
Virtual Appliance Simulator

• Functionalities
  ▪ Simulate 1 to 1000’s of Virtual Appliances
  ▪ Used During Development of Connectivity Solutions
  ▪ For Whirlpool’s Connected Appliances

• Features
  ▪ Appliance Configurator
  ▪ API Interface
  ▪ Scheduler
  ▪ Execution Engine
  ▪ Communication Interface with the Cloud

• Technologies
  ▪ Linux Operating System
  ▪ Thread Computing in Linux
  ▪ Linux Shell Scripting
  ▪ Cloud-Based Computing
  ▪ Java
Team Whirlpool
Evan Liang, Lisa Kelly, Cody Littley
Team Whirlpool
Project Plan Presentation

Whirlpool Virtual Appliance Simulator Configurator

Load Appliance
washer.xml  Load

Appliance
Washing Machine
Quantity: 5

Load Scripts
script3.scr  Load
script1.scr  Remove
script2.scr  Remove

Instances of Appliance
5  Set

Start
Screen Mockup: Configurator

Whirlpool Virtual Appliance Simulator Configurator

[Diagram of configurator interface]

Team Whirlpool
Project Plan Presentation
Team Whirlpool
Project Plan Presentation

Whirlpool Virtual Appliance Simulator Configurator

5 instances of appliance Washing Machine created.
5 instances of appliance Washing Machine running.

3-5 Pause Instance(s)
2-3 Unpause Instance(s)

Appliance Links

Pause Stop
<root>
  <Device ID="1" Name="Washer" DisplayName="Washer">
    <ActionStates>
      <Actions Type="CycleState" ID="1" Name="Fill" Duration="6000" />
      <Actions Type="CycleState" ID="2" Name="Wash" Duration="2000" />
      <Actions Type="CycleState" ID="3" Name="Spin" Duration="3000" />
      <Actions Type="CycleState" ID="4" Name="Drain" Duration="4000" />
    </ActionStates>
  </Device>
</root>
<table>
<thead>
<tr>
<th>Cycle Name</th>
<th>Time Stamp</th>
<th>Data packet (hexadecimal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spin Sun Feb 16 12:08:24 EST 2014</td>
<td>0x0000ED000FE62210D2000FF39001E</td>
<td></td>
</tr>
<tr>
<td>Drain Sun Feb 16 12:08:25 EST 2014</td>
<td>0x0000ED000FE62210E2000FF39001E</td>
<td></td>
</tr>
<tr>
<td>Drain Sun Feb 16 12:08:26 EST 2014</td>
<td>0x0000ED000FE62210E2000FF39001E</td>
<td></td>
</tr>
<tr>
<td>Drain Sun Feb 16 12:08:27 EST 2014</td>
<td>0x0000ED000FE62210E2000FF39001E</td>
<td></td>
</tr>
<tr>
<td>Drain Sun Feb 16 12:08:28 EST 2014</td>
<td>0x0000ED000FE62210E2000FF39001E</td>
<td></td>
</tr>
<tr>
<td>Fill Sun Feb 16 12:08:29 EST 2014</td>
<td>0x0000ED000FE62210B2000FF39001E</td>
<td></td>
</tr>
<tr>
<td>Fill Sun Feb 16 12:08:30 EST 2014</td>
<td>0x0000ED000FE62210B2000FF39001E</td>
<td></td>
</tr>
<tr>
<td>Fill Sun Feb 16 12:08:31 EST 2014</td>
<td>0x0000ED000FE62210B2000FF39001E</td>
<td></td>
</tr>
<tr>
<td>Fill Sun Feb 16 12:08:32 EST 2014</td>
<td>0x0000ED000FE62210B2000FF39001E</td>
<td></td>
</tr>
<tr>
<td>Fill Sun Feb 16 12:08:33 EST 2014</td>
<td>0x0000ED000FE62210B2000FF39001E</td>
<td></td>
</tr>
<tr>
<td>Fill Sun Feb 16 12:08:34 EST 2014</td>
<td>0x0000ED000FE62210B2000FF39001E</td>
<td></td>
</tr>
<tr>
<td>Wash Sun Feb 16 12:08:35 EST 2014</td>
<td>0x0000ED000FE62210C2000FF39001E</td>
<td></td>
</tr>
<tr>
<td>Wash Sun Feb 16 12:08:36 EST 2014</td>
<td>0x0000ED000FE62210C2000FF39001E</td>
<td></td>
</tr>
<tr>
<td>Spin Sun Feb 16 12:08:37 EST 2014</td>
<td>0x0000ED000FE62210C2000FF39001E</td>
<td></td>
</tr>
<tr>
<td>Spin Sun Feb 16 12:08:38 EST 2014</td>
<td>0x0000ED000FE62210D2000FF39001E</td>
<td></td>
</tr>
<tr>
<td>Spin Sun Feb 16 12:08:39 EST 2014</td>
<td>0x0000ED000FE62210D2000FF39001E</td>
<td></td>
</tr>
<tr>
<td>Drain Sun Feb 16 12:08:40 EST 2014</td>
<td>0x0000ED000FE62210E2000FF39001E</td>
<td></td>
</tr>
<tr>
<td>Drain Sun Feb 16 12:08:41 EST 2014</td>
<td>0x0000ED000FE62210E2000FF39001E</td>
<td></td>
</tr>
<tr>
<td>Drain Sun Feb 16 12:08:42 EST 2014</td>
<td>0x0000ED000FE62210E2000FF39001E</td>
<td></td>
</tr>
<tr>
<td>Drain Sun Feb 16 12:08:43 EST 2014</td>
<td>0x0000ED000FE62210E2000FF39001E</td>
<td></td>
</tr>
</tbody>
</table>
Team Whirlpool
Alpha Presentation

Front End Wire Frames
Team Whirlpool
Beta Presentation

Script File Generator

Select an API file to use with the script generator.

Load API  No API loaded

Script Generator

Script File Generator

<table>
<thead>
<tr>
<th>ID</th>
<th>Smart Grid Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SetSmartGridMode</td>
</tr>
</tbody>
</table>

- Time (ms):

- Smart Grid Mode:
  - EC1 SmartGridMode0
  - EC1 SmartGridMode1
  - EC3 SmartGridMode2

- Duration Hours:
  - EC1 No Choice

- Duration Minutes:
  - EC1 No Choice

- Offset Hours:
  - EC1 No Choice

- Offset Minutes:
  - EC1 No Choice

View XML Script

Save Script
Delete Packet
Team Whirlpool
Beta Presentation

Configuring a Simulation

Virtual Appliance System

- **Washing Machine**
  - Information
  - Select

- **Dryer**
  - Information
  - Select

- **Refrigerator**
  - Information
  - Select

- **Dish Washer**
  - Information
  - Select

**Add Appliance File type must be .XML**

- Configuration Files
- XML Files
  - Choose File... - no file selected

- Add another appliance

**Scripts**

- Choose File... - no file selected
- Add another Script

**Smart Appliance Identification Upload**

- SAID List
- # of SAID's Needed

Submit
The Capstone Experience

Dr. Wayne Dyksen
Department of Computer Science and Engineering
Michigan State University
Spring 2014
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

April 25, 2014
Auto-Owners Exhibition Award
Team Urban Science, Spring 2014
Dealer Improvement Recommender System
Ty Jones, Saranac, Collin Myers, Ben Mastay
Scott Lake and Bob Buchanan of Auto-Owners Insurance
General Motors Praxis Award
Team Boeing, Spring 2014
Flight Simulator Suite
Mike Marinetti, Stephi Stumpos, Chris Ek
Presented by Fred Killeen and Christian Stier of General Motors
TechSmith Screencast Award
Team GM, Spring 2014
http://www.capstone.cse.msu.edu/2014-01/projects/gm/
Duncan Young, Sam Moore, Matt Wein
Presented by Dean Craven of TechSmith
All-Hands Design Day, December 6, 2013
Auto-Owners Exhibition Award
Team MSUFCU, Fall 2013
Smart Start Savers
Allen Koppman, Mairin Chesney, Adam Proschek, Phil Getzen
Bob Buchanan and Scott Lake of Auto-Owners Insurance
General Motors Praxis Award
Team IBM, Fall 2013
Information Technology Assessment Toolkit
Connor Gilbert, Adam Koshorek, Eunbong Yang, Alex Hanlon
Presented by Fred Killeen and Christian Stier of General Motors
TechSmith Screencast Award
Team Urban Science, Fall 2013
Dealership Consultant Mobile App
Matt Ao, Zach Kuzmanic, Ryan Tempas, Eric Zipple
Presented by Dean Craven of TechSmith
Urban Science Sigma Award
Team Spectrum Health, Fall 2013
Talent Connections Careers Mobile Site
Hayden Boroski, Max Sweet, Nate Langolf, Chris Cheaney
Presented by Mike DeRiso and Matt Bejin of Urban Science
The Capstone Experience

Design Day Award Winners

April 26, 2013
All-Hands Design Day, April 26, 2013
Auto-Owners Exhibition Award
Team GM, Spring 2014
My Conference Room
Tom Smale, Matt Tarnowsky, Jeff Girbach, Daniel Bachelis
Presented by Sue Snodgrass, Erin McLaughlin, Bob Buchanan and Scott Lake of Auto-Owners Insurance
Chrysler Praxis Award
Team Mozilla, Spring 2014
Multi-Touch Gestures for Firefox
Bill de Araujo, Ray Heldt, Brandon Waterloo
Presented by Karen Wrobel of Chrysler
TechSmith Screencast Award

Team Whirlpool, Spring 2014

Guided Cooking and Recipe App

Zach Jones, Nick Kecskes, Duncan Finney, Josh Marti

Presented by Dean Craven of TechSmith
Urban Science Sigma Award
Team TechSmith, Spring 2014
American Sign Language Learning App
Malcolm Doering, Cadillac, Michelle Truong, Adam Crane
Presented by Greg Davidson of Urban Science
The Capstone Experience

Design Day Award Winners

December 7, 2012
Auto-Owners Exhibition Award
Team Mozilla, Fall 2012

Reader Mode for Desktop Firefox
Kevin Woodward, Michael Anderson, Matt Vorce, Chelsea Carr
Presented by Bob Buchanan and Scott Lake of Auto-Owners Insurance
Chrysler Praxis Award
Team Boeing, Fall 2012
Design, Fly and Compete Sim Suite V2.0
Jake Newsted, Kevin Liening, Dan Sosnowski, Max Ellison
Presented by Karen Wrobel of Chrysler
TechSmith Screencast Award
Team Ford, Fall 2012
MyKey Report Card
Alex Conklin, Kevin Klemmer, Andrew Crouch, Brandon D'Orazio
Presented by Dean Craven of TechSmith
Urban Science Sigma Award
Team Spectrum Health, Fall 2012
Medication Shortages Dashboard
Ramata Koumare, Aaron Cosentino, Grayson Wright, Eric Dostie
Presented by Greg Davidson and Matt Bejin of Urban Science
The Capstone Experience

Dr. Wayne Dyksen
Department of Computer Science and Engineering
Michigan State University
Spring 2014