

MICHIGAN STATE
UNIVERSITY

09/04: Project Plan

The Capstone Experience

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*From Students...
...to Professionals*

Project Plan

➤ Functional Specifications

- Design Specifications
- Technical Specifications

Functional Specifications

- What does it do?
(Not “how” does it do it?)
 - What’s the problem?
 - What’s your solution?
- Short List of Features
- Not Necessarily Complete
- Starting With
 - Shared Vision?
 - No Formal Documents?
 - Minimal Documents?
 - Incomplete Problem Statement?
- Understandable by End User
- Initial Problem Statement
- Usually Refined



Functional Specifications

- Auto-Owners
 - Manage Independent Insurance Adjusters
 - Handling Claims Resulting from Catastrophes
 - Hurricanes
 - Tornados
 - Earthquakes
 - Remotely, At Site of Catastrophe
- GM
 - Provide Information About a Particular Car
 - Make and Model
 - Manufacturer's Suggested Retail Price
 - Available Options
 - Location of Nearest Dealer
 - By Pointing Mobile Phone or Tablet Camera
- MSUFCU
 - Enable Mini MSUFCU Branch
 - At Local Elementary and Middle Schools
 - Accept Deposits from Students
 - Run by Parent Volunteers

Understandable
by End User



Functional Specifications Interactions With Your Client

- Derived With/From Client
- Documented For Client
- Presented to Client
- Agreed Upon With Client
- Your Job to Capture the Client's Intent!

Project Plan

✓ Functional Specifications

➤ Design Specifications

• Technical Specifications



Design Specifications

- How does a user use it?
How does it look and feel?
- Includes
 - “Business” Process Flow
 - Use Cases
 - Screen Mockups
 - Data Flow Diagrams
 - Data Organization
 - Etc...
- Identifies All the Parts and Their Interactions
- (Mostly) Understandable by End User
- Usually Refined



Design Specifications

- Boeing
 - 3-D Graphical Visualization
 - First Person View of Assembly Workers
 - Inverse Kinematic Algorithms
 - Quality Metrics
- TechSmith
 - Collect Information Via
 - TechSmith Smart Player
 - Web Browser Add-On
 - Microsoft User Interface Automation
 - User Provided Activity Hints
 - Shareable Activity Lists
 - Learning Activity Reporting Web Site
- Whirlpool
 - Native Apple iPad and Google Android Tablet Apps
 - Use Geolocation and Geofencing
 - Support Various SmartZones
 - Vacation
 - Comfort
 - AlertMe
 - RemindMe

Mostly
Understandable
by End User



Screen Mockups

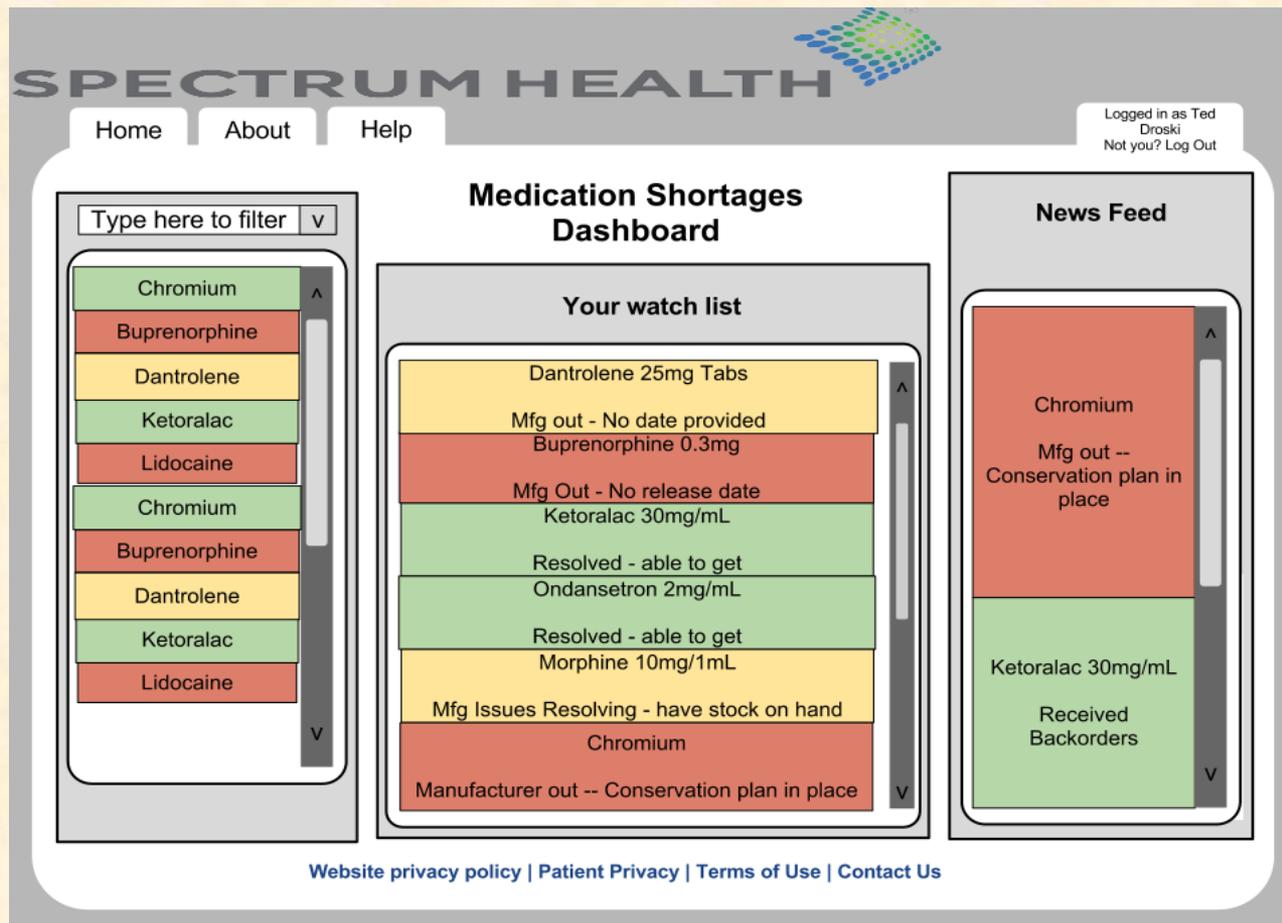
- User Interface Only
 - Shows Layout, Buttons, Pull-Downs, Etc...
 - Non-Functional
 - No Back End
- Helpful for Developing
 - Functional Specifications
 - Look-and-Feel
 - Use Cases
- Can Create with...
 - Pencil and Paper
 - PowerPoint (Developer View)
 - Photoshop
 - Etc...



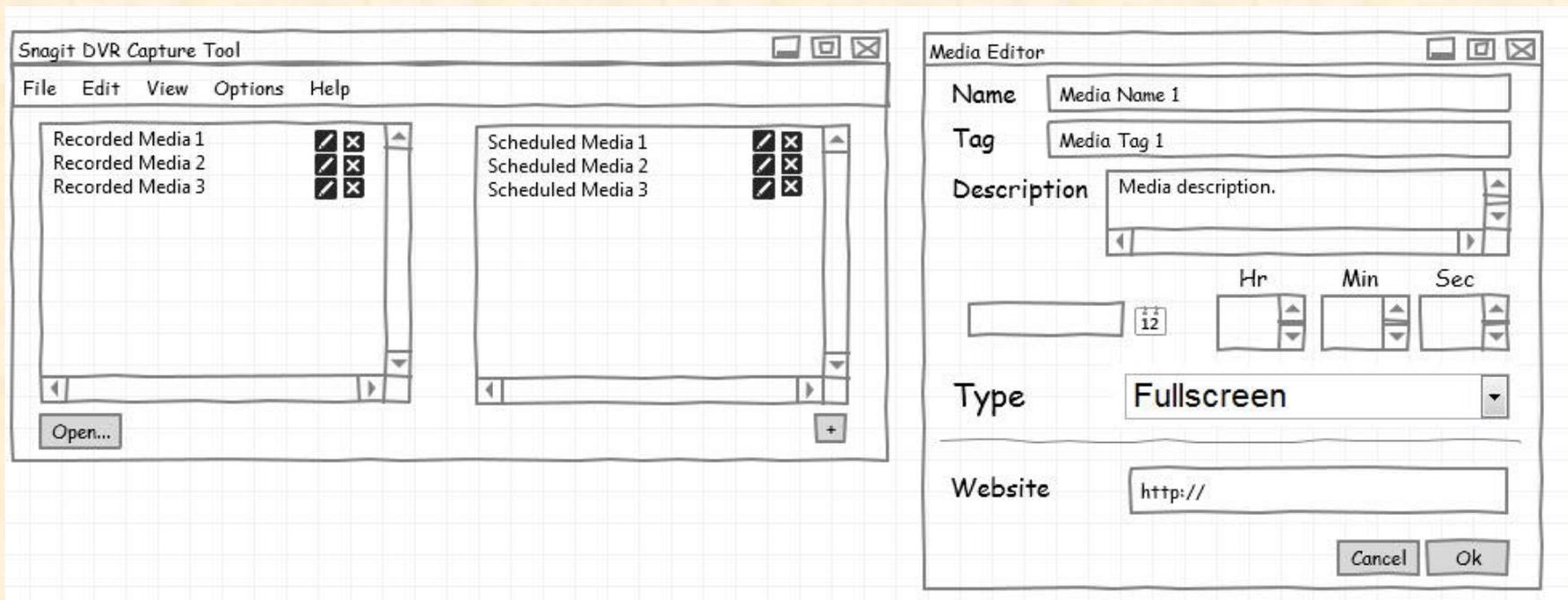
Screen Mockups

- “Use” with Clients
 - Show to Clients
 - Go Through Use Cases with Clients
- “Cruder” may be better.
 - What?
 - Why?

Screen Mockups Example



Screen Mockup Example



Design Specifications Interactions With Your Client

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Project Plan

✓ Functional Specifications

✓ Design Specifications

➤ **Technical Specifications**

Technical Specification

- How does it do it?
- Identifies All the Parts and Their Interactions
- Everything a Developer Needs to Write the Code
- Includes Things Like...
 - Overall System Architecture
 - Machine Architectures
 - Software Technologies
 - Production Environments
 - Development Environments
 - SDK's (Software Development Kits)
 - Network Topology
 - Database Schema
 - Continued...



Technical Specification

- Includes Things Like...
 - Object Models and Class Diagrams
 - UML Diagrams
 - Pseudo Code
 - Function Prototypes
 - Schedule
 - Test Plan
 - Risk Analysis
 - Etc...
- Probably Not Understandable by End User
- Usually Refined



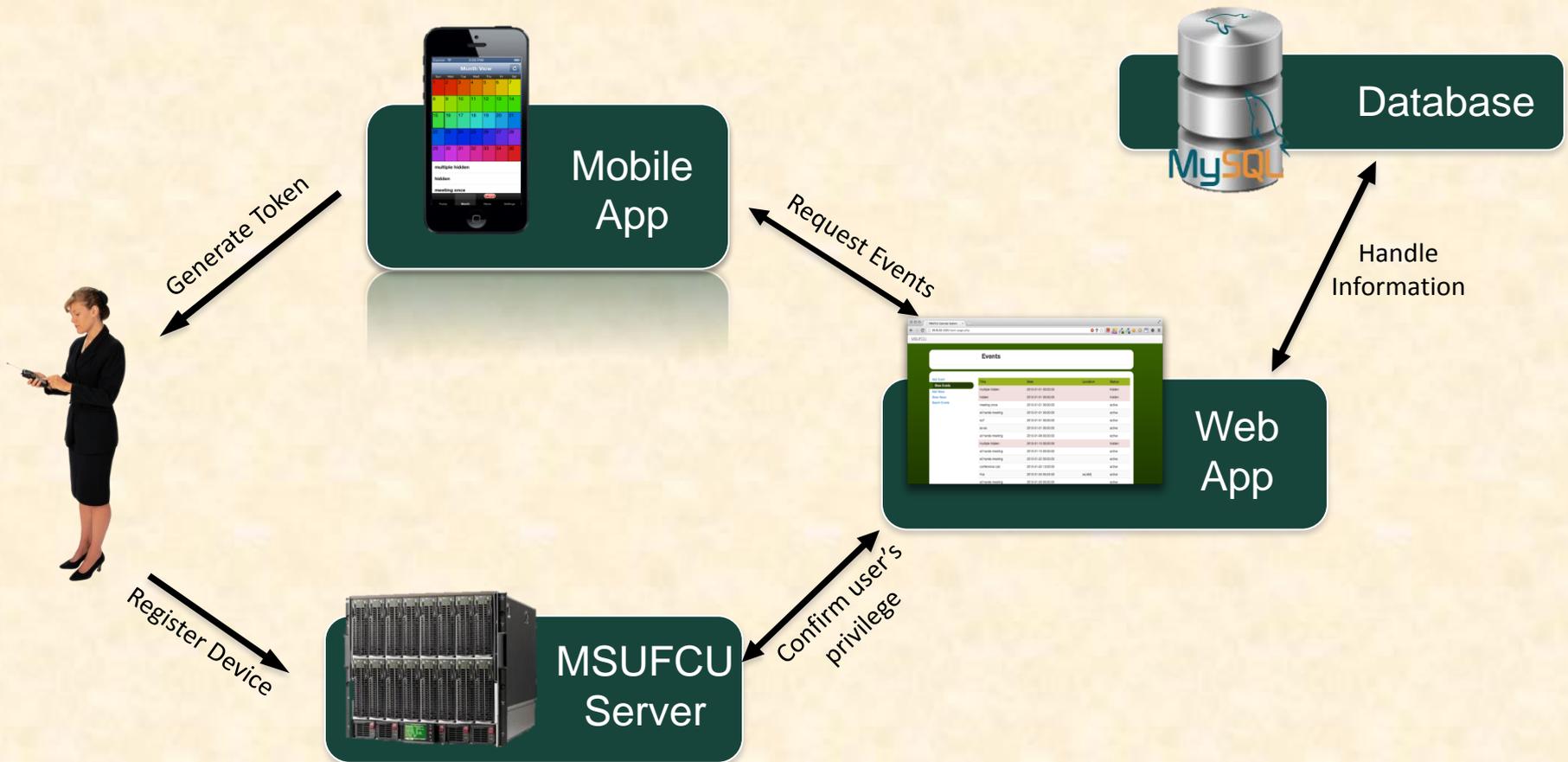
Technical Specifications

- GM
 - [Argon Web Browser](#)
 - [ARToolKit](#)
 - [ATOMIC Authoring Tool](#)
 - [ArUco](#)
 - [IQ Engines](#)
 - [PAR Works](#)
- Spectrum Health
 - CSS, HTML5
 - JavaScript, Ajax
 - jQuery, jQuery Mobile
 - Microsoft C#, ASP.NET MVC 4.0
 - Microsoft Internet Information Services (IIS) 7.0
 - RESTful Web Services
- Whirlpool
 - Apple iOS 6.x or Higher
 - Android Jelly Bean 4.2 or Higher
 - PhoneGap (Optional)
 - Mapping APIs (for Showing Locations of Geofenced SmartZones)
 - Whirlpool Connected Appliance APIs

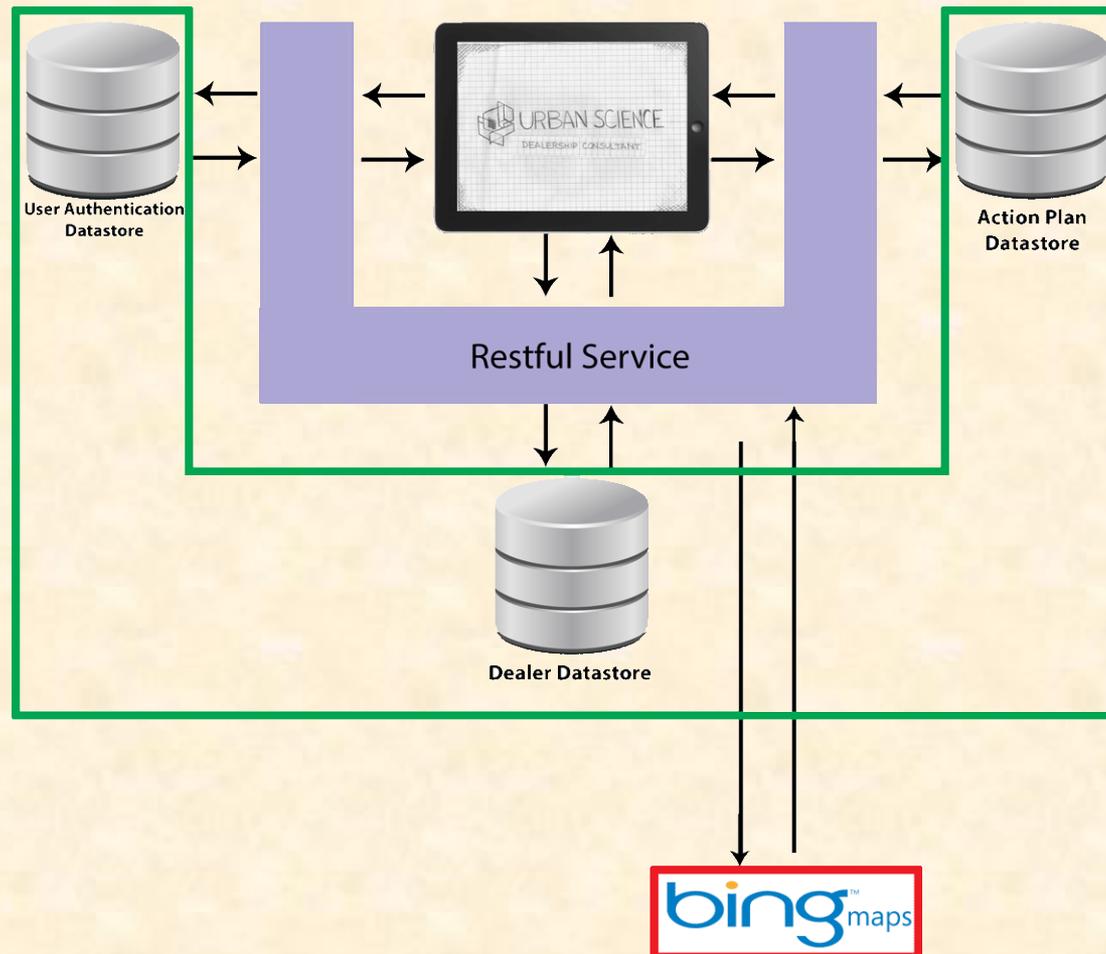
Probably Not
Understandable
by End User



System Architecture Example



System Architecture Example



Approach

- Break Big Problems Into Smaller Problems
- Identify Constraints
- Identify “Risks” — Things You Don’t...
 - ...Know
 - ...Understand
 - ...Know How To Do
- Consider Tradeoffs
- Select Appropriate Technologies
- Identify Core Features for a Prototype



Technical Specifications Interactions With Your Client

- Derived With/From Client
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- Presented to Client
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Cannot be emphasized enough!

Project Plan Summary

- Specifications
 - Functional: What does it do?
 - Design: How does it look and feel?
 - Technical: How does it do it?
- Testing Plan
- Schedule

How To's

(1 of 4)

- Quickly identify...
 - ...what you don't know,
 - ...what you don't understand, and
 - ...what you don't know how to do.
- Conceptually...
 - Start with functional specifications.
 - Get agreement with client.
 - Include as first part of project plan.
 - Do design specifications.
 - Get agreement with client.
 - Include as 2nd part of project plan.
 - Do technical specifications.
 - Get agreement with client.
 - Include as 3rd part of project plan.
 - Do schedule.
 - Do development, testing, and deployment.
- In CSE498, must do all three in parallel (and iterate).



How To's

(2 of 4)

- Approach

- Make Skeleton Document Immediately
 - Will Get You Organized and Focused
 - Include “Under Construction” Sections (Totally Empty)
- Develop In Parallel When Possible But...
 - Complete Functional First
 - Complete Design Second
 - Complete Technical Third
- Refine As Needed
- Assign Sections to Team Members
- Share with Client
 - Ask For (Specific) Feedback ← “Is this what you had in mind?”
 - Highlight What's New
 - Tricky Balance
 - ❖ Not Enough?
 - ❖ Too Much?



How To's

(3 of 4)

- Schedule
 - Dictated by Course
 - See Major Milestones
 - 09/11: Status Report Presentations
 - 09/16: Project Plan Presentations
 - 10/14: Alpha Presentations
 - 11/11: Beta Presentations
 - 12/02: Project Videos
 - 12/04: All Deliverables
 - 12/05: Design Day Setup
 - 12/06: Design Day
 - Other Milestones By Educated Guesses
 - Track To It At Least Weekly at Triage Meetings
 - Revisit Often and Revise If Necessary
 - Delivery Slippage == Graduation Slippage



How To's

(4 of 4)

- “Living Document”
 - Make Sure Your Project Plan Has...
 - Cover Page
 - Title
 - Table of Content
 - Page Numbers
 - Headers and Footers
 - Etc...
- (That is, make sure your plan looks professional.)



Interactions With Client

Client May Specify...

- Requirements
 - Functional
 - Design
 - Technical Requirements
 - Operating Systems
 - Programming Languages and Environments
 - Web Technologies
 - Etc...
 - Legacy
- Milestones
- Etc...

(You may explore and propose other ideas.)



Nota Bene: Project Plan

- How many...
 - ...drafts will you write? Many.
 - ...drafts will you share with your client? A Couple.
 - ...final documents will you submit for CSE498? One
- Due Date
 - Noon, Monday, September 16
 - Less Than 2 Weeks  Panic!
- In Class Formal Presentations
 - September 16 – September 25
 - PowerPoint Template Provided



Resources on the Web

- Other Links > Downloads

- Team Auto-Owners
- Team Meijer
- Team Spectrum Health

- Other Links > Online Resources

- W3 Schools
- iPhone Programming
- Apache Subversion
- Etc...

- High Resolution Sponsor Logo

www.capstone.cse.msu.edu/2013-08/projects/<sponsor>/images/originals/sponsor-logo.png

www.capstone.cse.msu.edu/2013-08/projects/auto-owners/images/originals/sponsor-logo.png



Project Plan

✓ Functional Specifications

✓ Design Specifications

✓ Technical Specifications

• Risks

• Prototypes

• Schedule

} Future Meetings



What's ahead?

(1 of 4)

- Team Photos
 - Informal: After Meeting Today
 - Formal: After Each Project Plan Presentation
 - Setup
 - Team Machines
 - Dell Server (Ask Malcolm)
 - Apple iMac, MacBook Pro
 - Team Software
 - Microsoft Office
 - ❖ Word and PowerPoint
 - ❖ Microsoft Windows Version
 - Web Server
 - Code Repository
 - SDK's
 - Etc.
- Required.
Get From Malcolm
- 

What's ahead?

(2 of 4)

- All-Hands Meetings
 - M, 09/09: Risks and Prototypes
 - W, 09/10: Team Status Reports
 - M, 09/16: Team Project Plan Presentations
 - W, 09/18: Team Project Plan Presentations
 - M, 09/23: Team Project Plan Presentations
 - W, 09/25: Team Project Plan Presentations
 - M, 09/30: Resume Writing and Interviewing
 - W, 10/02: Career Gallery



What's ahead?

(3 of 4)

- Team Status Report Presentations
 - PowerPoint Template
 - Due Midnight, Tuesday, September 10
 - Less Than One Week  Panic!
 - Email to Dr. D.
 - Subject: Team <Company Name>: Status Report
Subject: Team Auto-Owners: Status Report
 - Attachment: team-<company-name>-status-report-presentation.ppt
Attachment: team-urban-science-statue-report-presentation.ppt
- Dr. D. Will Combine Into Single PowerPoint
 - To Speed Things Up During Meeting
 - Do NOT Modify Master Slide Page
- Each Team Presents
 - Using Dr. D.'s Laptop
 - At Most 5 Minutes (Rehearse Timing)
 - Single or Multiple Presenters (Your Choice)



What's ahead?

(4 of 4)

- Project Plan Presentations

- PowerPoint Template

- Download Now
- Read the Read Me Slide (Over and Over and Over...)

- Submission

- Both Project Plan Document and PowerPoint Slide Deck
- Due Midnight, Sunday, September 15
- See Submission Instructions in Template

 Panic!

- Presenting

- 3 Teams Per Meeting Over 4 Meetings
- Schedule Posted Sunday Evening
- Strict 15 Minute Time Limit
- Use Team Member Laptop
 - ❖ Bring Power Cord
 - ❖ Test In Meeting Room (in Advance)

- Rehearse
- 5% of Final Grade
- Business Casual Dress

- Formal Team Photos

- Immediately Following Meeting
- In Capstone Lab

