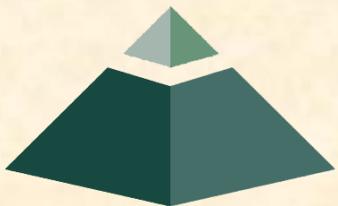


MICHIGAN STATE
UNIVERSITY

09/03: Project Plan

The Capstone Experience

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Fall 2014



*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
- Understandable by End User
- Initial Problem Statement
- Usually Refined



Functional Specifications

- Amazon
 - Alert Amazon Sellers Re
 - Brands Trending
 - Consumers' Sentiments
 - Based on Twitter Tweets
- Ford
 - Enable Ford Designers
 - To Benchmark Ford and Lincoln Products
 - Against Global Competitors
 - Via Mobile Web App
- MSUFCU
 - Enable MSUFCU Members to Refer
 - Family and Friends
 - To Become MSUFCU Members
 - Via Website and Mobile App

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

- Amazon
 - Consume Real-Time Twitter Stream
 - Provide Sentiment Analysis Model
 - Utilize Amazon Web Services
 - Endpoint Twitter Consumer Service
 - Workers to Analyze Tweets via Kinesis
 - Store Tweet Information via Redshift
 - Provide Graphical Web and Mobile Dashboards
- TechSmith
 - Create and Maintain Groups
 - Maintain Activities and Projects
 - Provide Various Views
 - Support Several Project Types
 - Instrument with Google Analytics
- Urban Science
 - Provide Evaluation Tool Based on Standards
 - Model Behavioral Competencies
 - Track Historical Employee Performance
 - Correlate Behavioral Competencies with Actual Results
 - Display Metrics for Original Equipment Manufacturers (OEMs)

Mostly
Understandable
by End User



Screen Mockups

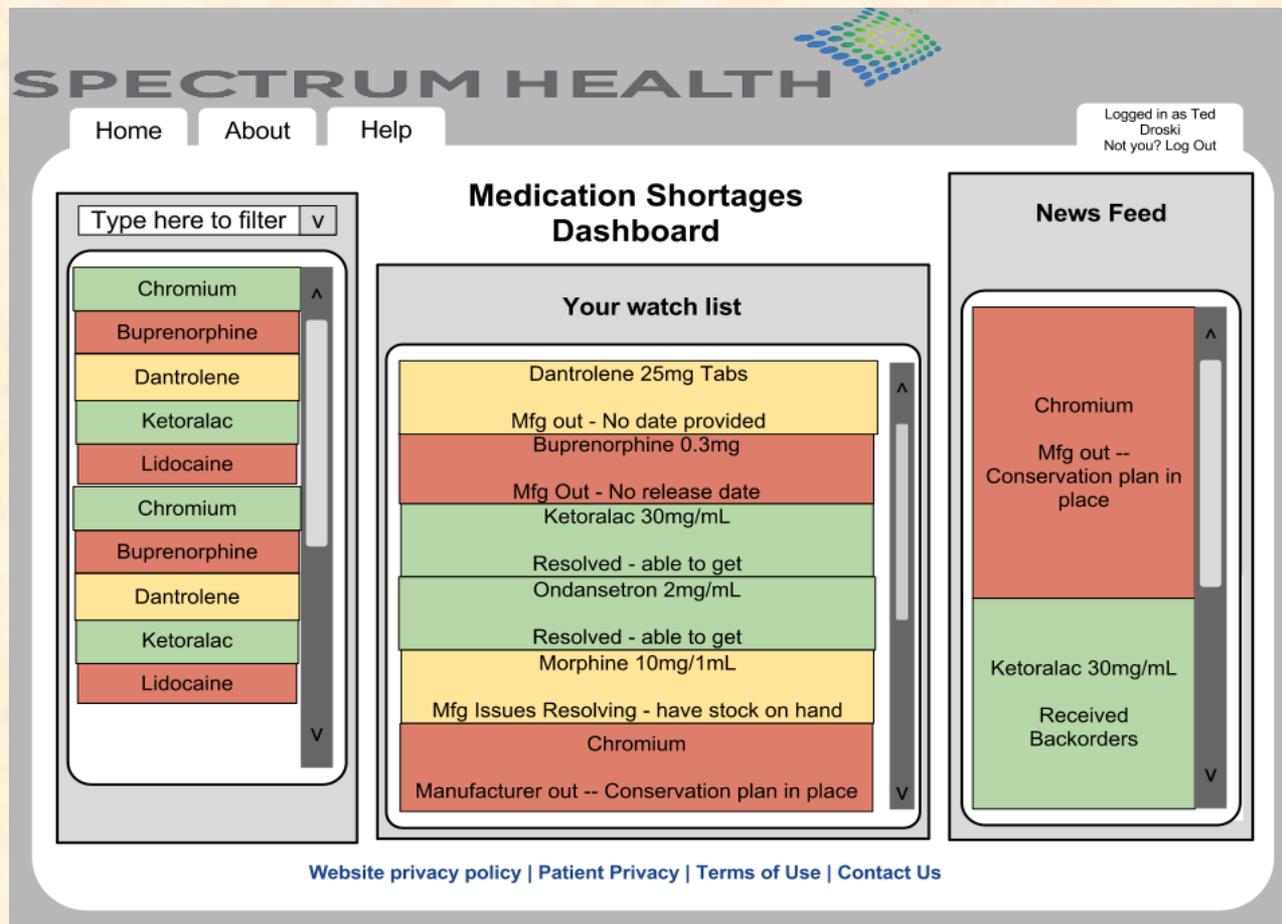
- User Interface Only
 - Shows Layout, Buttons, Pull-Downs, Etc...
 - Non-Functional
 - No Back End
- Helpful for Developing
 - Functional Specifications
 - Look-and-Feel
 - Use Cases
- Can Create with...
 - Pencil and Paper
 - PowerPoint (Developer View)
 - Photoshop
 - Etc...



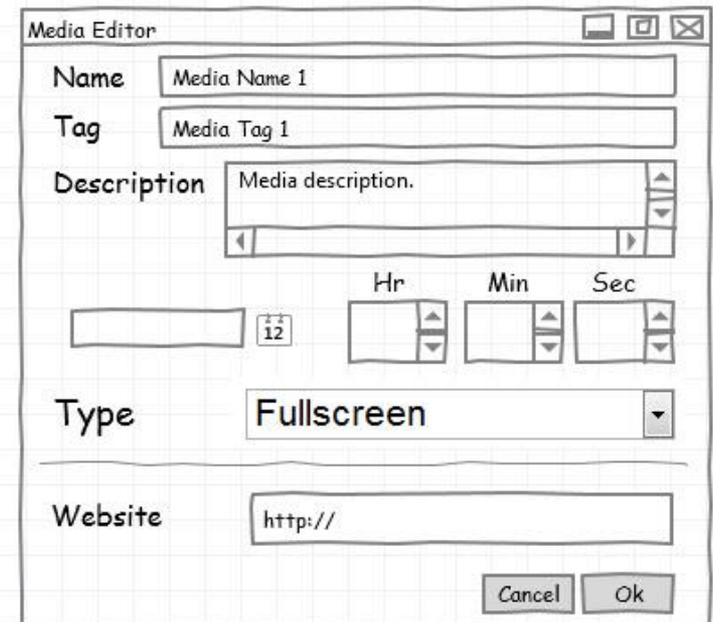
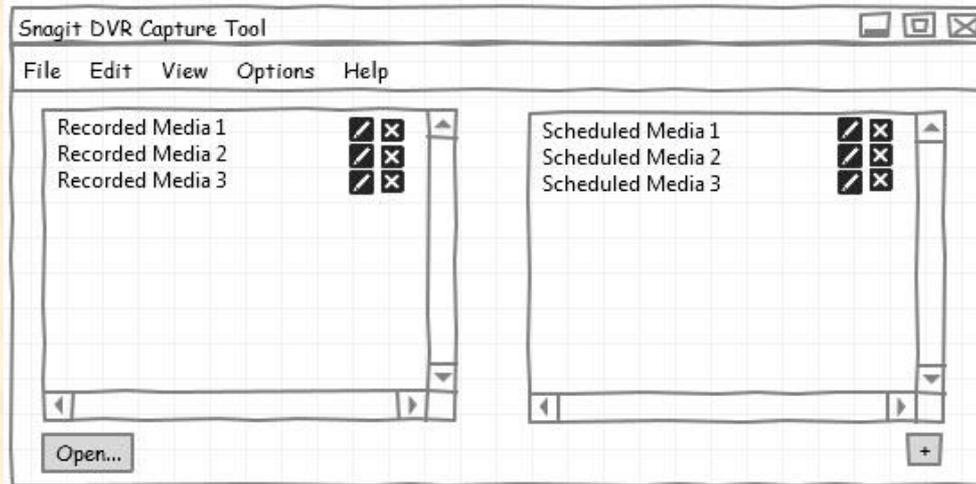
Screen Mockups

- “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



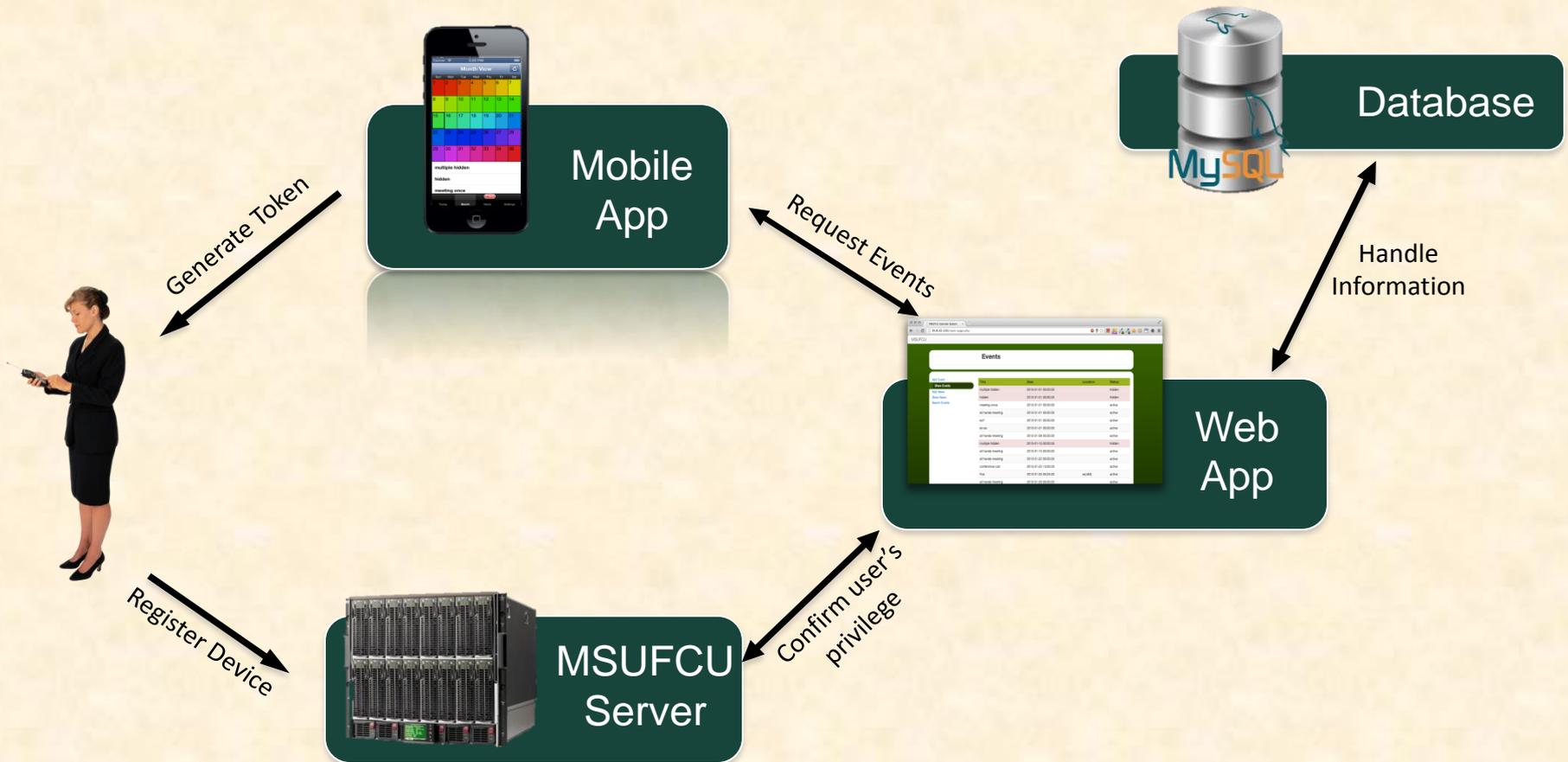
Technical Specifications

- Bosch
 - Google Android App Development
 - Java
 - Controller Area Network (CAN)
 - Universal Measurement and Calibration Protocol (XCP)
 - Vehicle Application Mobile Platform (VAMP)
 - Bluetooth
- GM
 - CSS, HTML, JavaScript
 - Internet Explorer, Chrome and Firefox
 - Microsoft .NET, Visual Studio
- Meijer
 - Xamarin or PhoneGap
 - iBeacon
 - Crashlytics
 - Mobile Development (Apple iOS or Google Android)
 - Microsoft .NET, Azure Mobile Service
 - Meijer Web Services

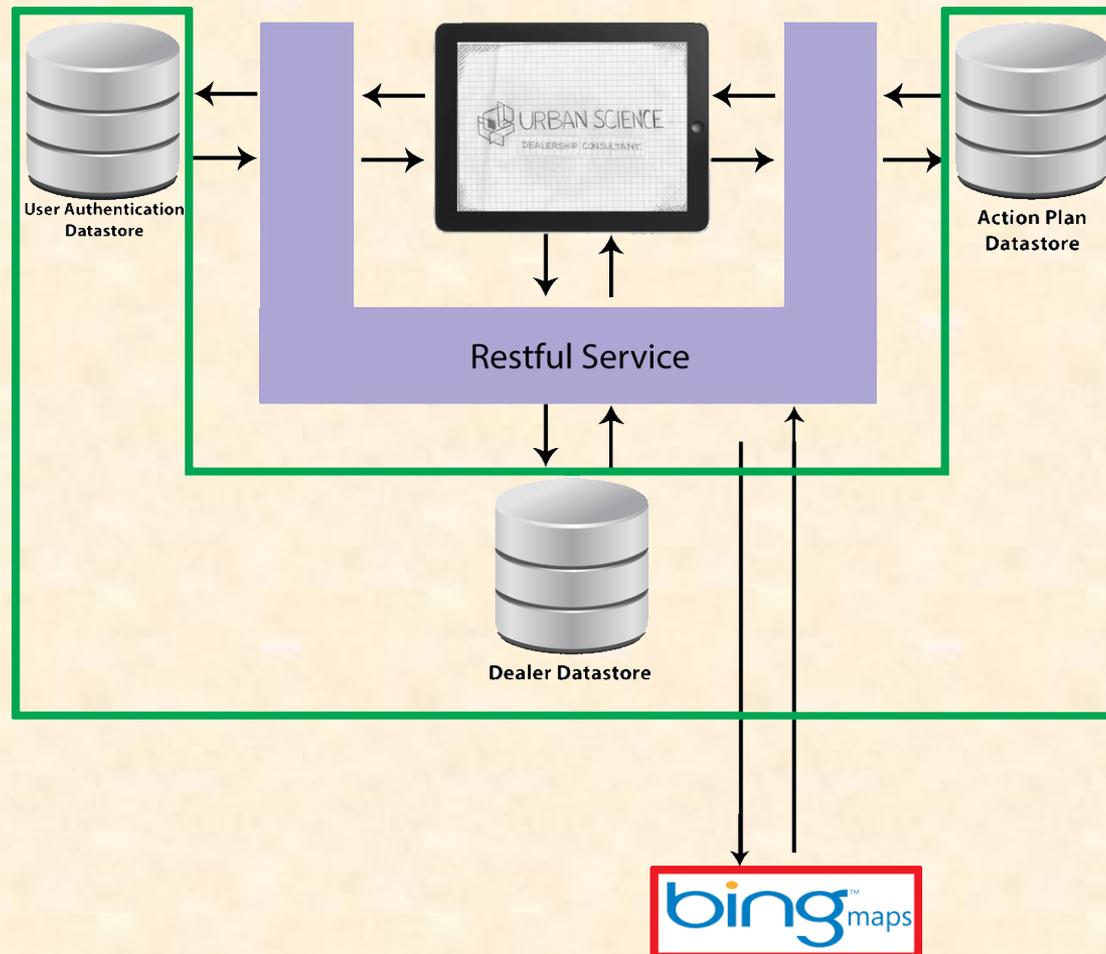
Probably Not
Understandable
by End User



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

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
 - 09/10: Status Report Presentations
 - 09/15: Project Plan Presentations
 - 10/13: Alpha Presentations
 - 11/03: Beta Presentations
 - 12/01: Project Videos
 - 12/03: All Deliverables
 - 12/04: Design Day Setup
 - 12/05: 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
 - Midnight, Sunday, September 14
 - < 2 Weeks  Panic!
- In Class Formal Presentations
 - September 15 – September 24
 - PowerPoint Template Provided



Resources on the Web

- Other Links > Downloads

- Team Meijer
- Team Quicken Loans
- Team Spectrum Health

- Other Links > Online Resources

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

- High Resolution Sponsor Logo

www.capstone.cse.msu.edu/2014-08/projects/<sponsor>/images/originals/sponsor-logo.png

www.capstone.cse.msu.edu/2014-08/projects/auto-owners/images/originals/sponsor-logo.png



Project Plan

✓ Functional Specifications

✓ Design Specifications

✓ Technical Specifications

• Risks

• Prototypes

• Schedule

} Future Meetings

