09/03: Project Plan

The Capstone Experience

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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
    o Brands Trending
    o 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
    o Family and Friends
    o 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
    o Endpoint Twitter Consumer Service
    o Workers to Analyze Tweets via Kinesis
    o 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
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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

- Mobile App
- MSUFCU Server
- Web App
- Database

- Generate Token
- Request Events
- Handle Information
- Register Device
- Confirm user's privilege
- Handle Information
System Architecture Example

- User Authentication Datastore
- Dealer Datastore
- Action Plan Datastore
- Restful Service
- Bing Maps
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

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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

• 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.
    o Get agreement with client.
    o Include as first part of project plan.
  ▪ Do design specifications.
    o Get agreement with client.
    o Include as 2nd part of project plan.
  ▪ Do technical specifications.
    o Get agreement with client.
    o 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

- **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
    - Highlight What’s New
    - Tricky Balance
      - Not Enough?
      - Too Much?

“Is this what you had in mind?”
How To’s

- **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

• “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
    o Operating Systems
    o Programming Languages and Environments
    o Web Technologies
    o 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

- 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**
  [Website 1](www.capstone.cse.msu.edu/2014-08/projects/<sponsor>/images/originals/sponsor-logo.png)
  [Website 2](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