01/08: 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

• Auto-Owners
  ▪ Collect Updated Policyholder Information
  ▪ By Underwriting Field Service Representatives
  ▪ Using Mobile Devices

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

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

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**
  - Based on FlightGear Flight Simulator
  - Support Networked Multiplayer Mode
  - Observe Flight Traffic Monitors
  - Collect Key Performance Statistics
- **Ford**
  - 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
- **TechSmith**
  - Models the Classroom
  - Teacher Dashboard and Student Dashboard
  - Notifications for Key Events
  - Assignment “Progress” Mechanism
  - Provide Usage Statistics

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

• Meijer
  ▪ CSS / HTML5
  ▪ Microsoft Azure Services
  ▪ Mobile Development Methodologies
  ▪ Social Media

• Quicken Loans
  ▪ 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

• Spectrum Health
  ▪ CSS / HTML5
  ▪ JavaScript / AngularJS
  ▪ ASP.net MVC
  ▪ Microsoft Internet Information Services (IIS) 7.0
  ▪ Microsoft SQL Server
  ▪ REST Service Layer

Probably Not Understandable by End User
System Architecture Example

- Generate Token
- Request Events
- Confirm user's privilege
- Handle Information

Mobile App

Web App

MSUFCU Server

Database

Register Device
System Architecture Example

User Authentication Datastore

Restful Service

Dealer Datastore

Action Plan Datastore

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

• 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

• “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
  ▪ Noon, Monday, January 27
  ▪ 2 Weeks

• In Class Formal Presentations
  ▪ January 27 – February 5
  ▪ PowerPoint Template Provided

Panic!
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...

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