MICHIGAN STATE UNIVERSITY

09/07: Project Plan

The Capstone Experience

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From Students…
…to Professionals

Project Plan

- ➢Functional Specifications
- Design Specifications
- Technical Specifications
- Schedule
- Risks

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
Building a House

- Comfortably House a Family of 5
- 4 Bedrooms
- 2.5 Bathrooms
- Study
- 2-Car Garage
- Walk-Out Basement

Functionally, what else might you like to know?

(Note: Understandable by "User")

Functional Specifications (Refined)
Building a House

- ~ 2,500 sq. ft.
- $275,000 - $325,0000
- 4 Bedrooms
- 2.5 Bathrooms
- Formal Living Room and Family Room
- Study
- 2-Car Garage
- Walk-Out Basement

What do you need to know next?

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
- Schedule
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Design Specification

- 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 Building a House

- Mission Style, Stone Front
- Lots of Light
- Kitchen Connected to Family Room
- Master Bedroom on Main Floor
- Cathedral Ceilings
- Granite Counter Tops
- Etc…

What else will you need to know to build the house?

(Note: Understandable by "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)
  - 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

Figure 1.1

Design Specifications
Interactions With Your Client

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Project Plan

✓Functional Specifications

✓Design Specifications

➢Technical Specifications

- Schedule
- Risks

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

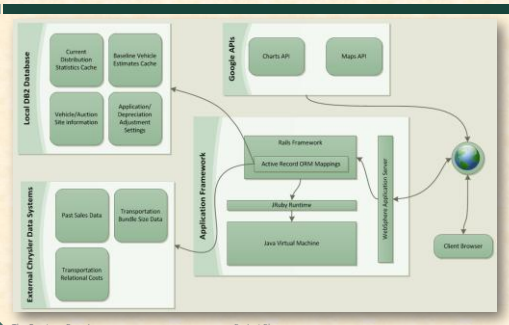
- Includes Things Like…
  - Object Models and Class Diagrams
  - UML Diagrams
  - Pseudo Code
  - Function Prototypes
  - Schedule
  - Test Plan
  - Risk Analysis
  - Etc…
- Probably Not Understandable by End User
- Possibly Not Understandable by Client
- Usually Refined

Technical Specifications
Building a House

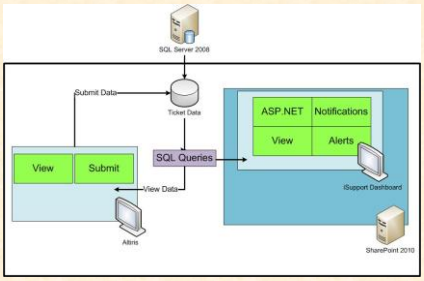
- 20 lb. Asphalt Roof Shingles
- 2" x 6" Outside Walls
- R48 Blown Attic Insulation
- Cat5E Wiring
- Pre-Made Roof Trusses
- 12" Poured Concrete Foundation
- Etc...

(Note: Probably Not Understandable by "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
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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
    - 09/14: Status Reports
    - 09/21: Project Plan Presentations
    - 10/17: Alpha Presentations
    - 11/17: Beta Presentations
    - 12/05: Project Videos
    - 12/07: All Deliverables
    - 12/08: Design Day Setup
    - 12/09: 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, Wednesday, September 21
  - Less Than 2 Weeks
- In Class Formal Presentations
  - September 21 – October 3
  - PowerPoint Template Provided

Resources on the Web

- Other Links > Downloads
  - Boeing
  - Microsoft
  - Motorola
  - Union Pacific Railroad
- Other Links > Online Resources
  - W3 Schools
  - iPhone Programming
  - Apache Subversion
  - Etc…

Project Plan

- ✓Functional Specifications
- ✓Design Specifications
- ✓Technical Specifications
- Schedule
- Risks

Next Meeting

What's next?

- Team Photos
  - Informal: After Meeting Today
  - Formal: After Each Project Plan Presentation
- Setup
  - Team Machines
    - Server (Ask Meredith re Assignment)
    - Desktop Etc.
  - Team Software
    - Web Server
    - Code Repository
    - SDK's
    - Etc.
- Think About Team Status Report

What's next?

- Team Status Report
  - PowerPoint Template
  - Due Midnight, Tuesday, September 13
  - Email to Dr. D.
    - Subject: Team <Company Name>: Status Report
    - Attach: team-<company-name>-status-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)

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09/12: Project Schedule and Risk

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