MICHIGAN STATE
U N I V E R S I T Y

09/08: Project Plan

The Capstone Experience

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From Students…
…to Professionals

Project Plan

➤ Functional Specifications

• Design Specifications

• Technical Specifications

• Schedule

• Risks

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Functional Specifications

• What does it do?
  (Not "how" does it do it?)
• 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

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Functional Specifications
Building a House

• 4 Bedrooms
• 2.5 Bathrooms   Functionally, what
• Study   else might you like
                                 to know?
• 2-Car Garage
• Walk-Out Basement
(Note: Understandable by "User")

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Functional Specifications (Refined)
Building a House

• ~ 2,500 sq. ft.
• $275,000 - $325,0000   What do you
                                need to know
• 4 Bedrooms   next?
• 2.5 Bathrooms
• Formal Living Room and Family Room
• Study
• 2-Car Garage
• Walk-Out Basement

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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!

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Project Plan

✓ Functional Specifications

➢ Design Specifications

• Technical Specifications

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

• Granite Counter Tops

• Etc…

(Note: Understandable by "User")

Screen Mock-Ups

• 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 Mock-Ups

• "Use" with Clients
  ▪ Show to Clients
  ▪ Go Through Use Cases with Clients
• "Cruder" may be better.
  ▪ What?
  ▪ Why?

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…
  ▪ Machine Architectures
  ▪ Software Technologies
  ▪ Production Environments
  ▪ Development Environments
  ▪ SDK's (Software Development Kits)
  ▪ Network Topology
  ▪ Database Schema
  ▪ Object Models and Class Diagrams
  ▪ Continued…

Technical Specification

• Includes Things Like…
  ▪ 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")

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!

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
    - Highlight What's New   ← Is this what you had in mind?
    - Tricky Balance
      - ❖ Not Enough?
      - ❖ Too Much?

How To's (3 of 4)

- Schedule
  - Dictated by Course
  - See Major Milestones
    - 09/15: Team Status Reports
    - 09/27: Team Project Plans
    - 10/11: Team Alpha Presentations
    - 11/08: Team Beta Presentations
    - 12/06: Team Project Videos
    - 12/08: Team Project Videos and All Deliverables
    - 12/09: Team 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 26
  - About 2.5 Weeks
- In Class Formal Presentations
  - September 27 – October 4
  - PowerPoint Template Provided

Resources on the Web

- Other Links > Downloads
  - Boeing
  - Microsoft
  - Motorola
  - Union Pacific Railroad
- Other Links > Online Resources
  - W3 Schools
  - Apache Subversion
  - SourceForge.net
  - 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
    o Server
    o Desktop
    o Etc.
  - Team Software
    o Web Server
    o Code Repository
    o SDK's
    o Etc.
- Think About Team Status Report

What's next?

- Team Status Report
  - PowerPoint Template
  - Due Midnight, Tuesday, September 14
  - Email to Dr. D.
    o Subject: Team <Company Name>: Status Report
    o Attach: team-<company-name>-status-report.pptx
- 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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09/13: Project Schedule and Risk

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