MICHIGAN STATE UNIVERSITY

2. Technical Specifications

CSE 498, Collaborative Design

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Technical Specification

- Written Document
- Describes
  - The "Problem"
  - Your Proposed Solution
- Complete
  - Functionally
  - Design-Wise
  - Technically
- "Only" Thing Left To Do Is "Programming"
- (Ideally) Could Be Used for Out-Sourcing
- (AKA, Architecture Document,...)

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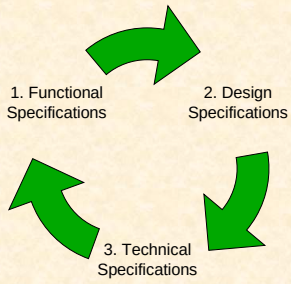
Design Process Overview



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Technical Specifications

☒ Functional Specifications

☐ Design Specifications

☐ Technical Specifications

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Functional Specifications

- What it's supposed to do?
  (Not "how" is it supposed to 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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Building a House (1 of 4)

Functional Specifications

- 4 Bedrooms
- 2.5 Bathrooms
- Study
- 2-Car Garage
- Walk-Out Basement

Functionally, what else might you like to know?

(Note: Understandable by "User")

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Building a House (2 of 4)

Functional Specifications Refined

- ~ 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?

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Interactions With Your Client

Functional Specifications

- 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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Technical Specifications

☑Functional Specifications

☒Design Specifications

☐Technical Specifications

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Design Specification

- Written Document
- Includes
  - 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

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Building a House (3 of 4)

Design Specifications

- 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")

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Screen Mock-Ups

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

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Screen Mock-Ups

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

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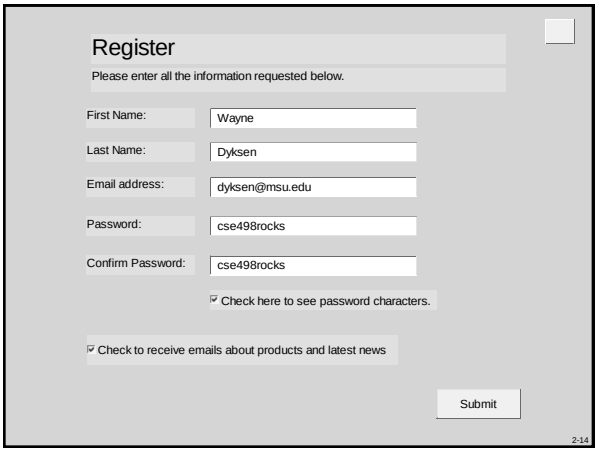

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Interactions With Your Client

Design Specifications

- Derived With/From Client
- Documented For Client
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Technical Specifications

☑Functional Specifications

☑Design Specifications

☒Technical Specifications

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Technical Specification (1 of 2)

- Written Document
- Identifies All the Parts and Their Interactions
- Everything a Developer Needs to Write the Code
- Includes Things Like…
  - Functional Specifications
  - Design Specifications
  - Machine Architectures
  - Software Technologies
  - Production Environments
  - Development Environments
  - SDK's (Software Development Kits)
  - Network Topology
  - Continued…

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Technical Specification (2 of 2)

- Includes Things Like…
  - Database Schema
  - 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

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Building a House (4 of 4)

Technical Specifications
- 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")

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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

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Interactions With Your Client

Technical Specifications
- 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!

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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 spec.
    - Get agreement with client.
    - Include as first part of technical spec.
  - Do design spec.
    - Get agreement.
    - Include as 2nd part of technical spec.
  - Do technical spec.
    - Get agreement.
    - Finish technical spec.
  - Do schedule.
  - Do development, testing, and deployment.
- In CSE498, must do all three in parallel (and iterate).

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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
    - Revise As Needed
  - 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?

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How To's (3 of 4)

- Schedule
  - Dictated by Course
  - See Meeting Agendas
    - 01/16 Team Status Report
    - 01/28 Technical Specifications / Schedule
    - 02/08 Alpha Demos
    - 03/17 Beta Demos
    - 04/21 Project Video
    - 04/23 All Deliverables
  - Other Milestone By Educated Guesses
  - Track To It
  - Revisit Often
  - Delivery Slippage = Graduation Slippage

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How To's (4 of 4)

"Living Document"

Make Sure Your Tech Spec Has…

- Cover Page
- Title
- Table of Content
- Page Numbers
- Headers and Footers
- Etc…

(That is, make sure your spec looks professional.)

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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.)

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Nota Bene: Tech Spec

- 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
  - January 28
  - Less Than 4 Weeks
- In Class Formal Presentations
  - January 28 – February 6
  - PowerPoint Template Provided

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Resources on the Web (1 of 2)

- By Peter Surna
  - How to Write Specifications Part 1
  - How to Write Specifications Part 2
  - Joke-A-Day Web Site – A Sample Design Specification
  - www.yart.com
- CSE498 Web Site Downloads
  - Motorola
  - Union Pacific

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Resources on the Web (2 of 2)

- W3 Schools
  - Web Developer Resources
    - Tutorials
      - HTML
      - XML
      - Browser Scripting
      - Server Scripting
      - .NET
      - Multimedia
      - Web Building
    - References
    - Examples
    - Quizzes
    - Quick Starters
  - Good
  - Free
- CSE498 Web Site Resources

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Technical Specifications

☑Functional Specifications

☑Design Specifications

☑Technical Specifications

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What's next?

- Meet Team Members After Class
- Schedule
  - First Meeting ASAP
  - Schedule Weekly Team Meeting
  - Schedule Weekly Triage Meeting with Matt
- Select Client Contact Person
- Contact Client
- Setup
  - Team Machines
  - Team Website
- Think About Team Status Report

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Client Contact

- Pick a Team Client Contact Today
- Send Email Immediately
- Send Contact Info for All Team Members
  - Email
  - Cell Phones
- Request
  - Contact Info for All Client Contacts
  - Time (in Next Day or So) for Meeting and/or Call
- On-Site Visit(s)
  - Do If Possible
  - Do Not Wait for On-Site to Get Started

Team <#> Status Report (1 of 4)

Team <#>: <team_name>

- Client Contact
  - Status Point 1
  - Status Point 2
- Team Meetings
  - Status Point 1
  - Status Point 2
- Team Organization
  - Description Point 1
  - Description Point 2

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Team <#> Status Report (2 of 4)

Team <#>: <team_name>

- Server Systems / Software
  - Description &/or Status Point 1
  - Description &/or Status Point 2
- Development Systems / Software
  - Description &/or Status Point 1
  - Description &/or Status Point 2
- Web Site
  - Status Point 1
  - Status Point 2

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Team <#> Status Report (3 of 4)

Team <#>: <team_name>

- Project Definition
  - Description Point 1
  - Description Point 2
  - Description Point 3
  - Description Point 4
- Technical Specification Document
  - Status Point 1
  - Status Point 2
  - Status Point 3
  - Status Point 4

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Team <#> Status Report (4 of 4)

Team <#>: <team_name>

- Risks
  - Risk 1
    - Description
    - Mitigation
  - Risk 2
    - Description
    - Mitigation
  - Risk 3
    - Description
    - Mitigation
  - Risk 4
    - Description
    - Mitigation

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