09/12: **Project Schedule and Risk**

**The Capstone Experience**

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**Identifying Risks**

- What You Don’t
  - Know
  - Understand
  - Know How to Do
- Normally
  - Major Project Features
  - “Showstoppers”
- Varies From
  - Not Familiar With But (Probably) Can Learn to
  - Absolutely No Idea How to Do It

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**Example Risks**

Including but not limited to...

- Key Application Features
- Hardware Systems
- Software Systems
- Development / Programming Environments
- Programming Languages
- Etc...

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**Prioritizing Risks**

- Classify Difficulty
  - High: Very Hard, No Idea How to Do
  - Medium: Not Hard, Probably Doable
  - Low: Not Hard, Probably Doable
- Classify Importance
  - High: Showstopper, Must Have
  - Medium: Nice to Have
  - Low: Not Vital, Nice to Have

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**Prioritizing Risks**

- Difficulty: High, Medium, Low
- Importance: High
- Work On Now
- Work On Later

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Case Study: Basketball App

- For Each Player, Track
  - Minutes Played
    - Game Clock Time
    - Consecutive & Total
  - Minutes Rested
    - Wall Clock Time
    - Consecutive
- Must Be Usable
  - On the Bench
  - In Real Time

Basketball App Architecture

Basketball Playing/Resting Time

- Play/Rest Time
- Application
- Visual Basic
- MS Access
- Windows Vista
- Tablet PC

Basketball App Risks?

- How do I program in VB?
- How do I make a GUI in VB?
- What SDK should I use?
- How do I interface VB with Access?
  - Create/Open/Save a Database?
  - Read/Write Records?
  - Traverse Records?
- How do I do clocks in Windows?
  - Game Clock?
  - Wall Clock?

How would you classify these risks?

Basketball App Risk Mitigation

- Game Clock
  - Start /Stop
  - Counts Down
  - By Minutes/Seconds
- Handling Access Records
  - Write Number
  - Read Number
  - Add Up Numbers

Note: Number of Logically Corrected Destinations

Mitigating Risks

- Use Existing Resources
  - Including But Not Limited To
    - Product Demos
    - Book Sample Code
    - Downloadable Examples
    - Etc...
  - Test Drive
    - Install
    - Compile
    - Extend
    - Etc...
- Build Prototypes
  - Single Purpose
  - Quick-and-Dirty

What are your risks?
The Capstone Experience

Project Schedule and Risk

Risk

Project Schedule

• Teamwork

Where do you start?

• Project Plan

• Prioritized Risks

• Feature Set(s)

• Fixed Milestones
  ▪ Course
  ▪ Client

Tradeoffs...
Features
vs.
Time

Are there fixed milestones in the "real" world?

Major Milestones

- 08/31: Capstone Overview
- 09/03: (Labor Day, No Meeting)
- 09/07: Project Plan
- 09/12: Project Schedule and Risk
- 09/14: Team Status Reports
- 09/19: Resume Writing and Interviewing
- 09/21: Team Project Plan Presentations
- 09/26: Team Project Plan Presentations
- 10/03: Team Project Plan Presentations
- 10/05: Career Gallery
- 10/10: Prototyping
- 10/12: Creating and Giving Presentations
- 10/17: Team Alpha Presentations
- 10/19: Team Alpha Presentations
- 10/26: Team Alpha Presentations

- 10/24: Design Day and the Project Videos
- 11/02: Career Day
- 11/07: Team Beta Presentations
- 11/09: Team Beta Presentations
- 11/14: Team Beta Presentations
- 11/16: Team Beta Presentations
- 11/21: Team Status Reports
- 11/23: Team Status Reports
- 11/28: Ethics and Professionalism
- 11/29: Intellectual Property and Copyright
- 12/02: Team Project Videos
- 12/07: Team Project Videos and All Deliverables
- 12/09: Design Day Setup
- 12/10: Design Day
- 12/15: Team Project Videos

Project Parts

• Break Down Project
  ▪ Main Parts
  ▪ Sub-Parts
  ▪ Sub-Sub-Parts
  ▪ Etc...

• Categorize
  ▪ Risks
  ▪ Dependencies (Particularly Risk Dependencies)
  ▪ Priorities

• Worry About
  ▪ Interfaces Between Parts
  ▪ Integration of Parts

Building A Project Schedule

• Start With Fixed Course Milestones
• Estimate Times for Tasks for Parts
  ▪ Building
  ▪ Integrating
  ▪ Testing
• Assign Tasks to Team Members
• Must Keep Everyone Busy All the Time
• Use “Short” Deadlines (E.g., 2-3 Days) Why?
• Document and Track
  ▪ Microsoft Project?
  ▪ Collaboration Tool?

Estimating Time for Tasks

• Rough Estimate
  ▪ Intuition
  ▪ Experience

• Refined Estimate
  ▪ Prototype or Partial Build
  ▪ Extrapolation
  ▪ E.g., 2 Days to Build 1 → 6 Days to Build 3
• Keys
  ▪ Be Realistic
  ▪ Include Buffer Time if Unsure
• Adjust Schedule Accordingly
Typical Build Cycle

Until Project Done Do
1. Divide Next Big Task Into Little Tasks
2. Assign Little Tasks to Team Members
3. Complete Little Tasks
   a. Implement
   b. Test
4. Integrate Little Tasks Into Big Task
5. Test Big Task

Very Important

Living Schedule

• Schedule Is Dynamic
  • Unforeseen Problems
  • Added Features (Avoid Feature Creep)
  • Etc...
• Track Your Progress
  • Microsoft Project?
  • Collaboration Tool?
• Revisit Schedule Often
  • Weekly Team Meetings
  • Weekly Triage Meetings with TA
  • Identify Slippage
  • Hold Each Other Accountable (or Contact TA or Me)
  • Set Corrective Action
  • Adjust Schedule

Project Schedule and Risk

✓ Risk

✓ Project Schedule

➤ Teamwork

Team Organization

• Up to Each Team
• Organize into Roles
  • Client Contact
  • Program Manager
  • Developer
  • Tester
  • Systems Administrator
  • Web Master
  • Etc....
• Everyone Must Make Technical Contributions

Team Dynamics

• Key to Success
• Significant Component of Course Grade
• Address Problems Immediately
  • Within Team
  • With Dr. D. and/or TA
• Be Ready to Discuss During Interviews

Revision Control

• Versioning
  • Discrete “Internal” Versions (States)
  • May Correspond to Builds
• Revision Control Systems
  • Check Code In and Out
  • Mark Specific States as Versions
• Motivation
  • Build Breaks System
  • Revert to Earlier Build
  • Avoid Bridge Burning
• Examples
  • Visual SourceSafe
  • GNU RCS (Revision Control System)
Grading (1 of 3)

- Team (70%)
  - Project Plan Document & Presentation
  - Alpha Presentation
  - Beta Presentation
  - Project Video
  - Project Software & Documentation
  - Design Day
  - Total
- Individual (30%)
  - Technical Contribution
  - Team Contribution
  - Team Evaluation
  - Meeting Attendance
  - Total

Grading (2 of 3)

- Final Grade Sum Of...
  - Individual Total
  - % of Team Total Based on Team Contribution
  - Grand Total = (Individual Total) + (Team Total) * (Team Contribution) / 10.0
- Nota Bene: Your Team Contribution will have a very significant effect on your final grade.

Team of Peers

Effective Team Members
- Relate as Equals
- Have Specific Roles and Responsibilities
- Respect Specific Roles and Responsibilities
- Empowers Individuals in Their Roles
- Have Specific Skills
- Hold Each Other Accountable
- Drive Consensus-Based Decision-Making
- Give All Members a Stake in the Project

Potential Problems

Over and/or Under
- Bearing
- Qualified
- Achiever
- Etc...

Mutual Responsibility

- You are your “brother’s/sister’s keeper”.
- Responsible For
  - Your Contribution
  - Your Teammates’ Contributions
- What Won’t Work
  - “They never asked me to do anything.”
  - “They never let me do anything.”
  - “He/she never asked to do anything.”
  - “He/she never wanted to do anything.”
  - Etc.

Team Evaluation Form

- 5% of Final Grade
- Rate Each Team Member
  - Technical Contributions
  - Overall
    - Effort
    - Performance
- Other Questions
  - 8. Describe the contributions of each team member, starting with you. Be specific. Include comments about your/their individual technical contributions as well as your/their contributions to the team as a whole.
  - 9. Whom do you feel did the best (either in effort or overall contribution to the team)? Why? Be specific.
  - 10. Whom do you feel did the worst (either in effort or overall contribution to the team)? Why? Be specific.
Team Problems

- Can Be
  - Really Hard
  - Awkward
  - Frustrating
  - Etc...
- Addressing Problems
  - ASAP
  - Directly
  - Respectfully
  - Maturely
- Resolving Problems
  - Internally First
  - See Dr. D. and/or TA Next but ASAP (Don’t Wait)
  - “Bad” Team Not an Acceptable Excuse

Project Schedule and Risk

- Risk
- Project Schedule
- Teamwork

What’s ahead?

- M, 09/12: Project Schedule and Risk
- W, 09/14: Team Status Reports
- M, 09/19: Resume Writing and Interviewing
- W, 09/21: Team Project Plan Presentations
- M, 09/26: Team Project Plan Presentations
- W, 09/28: Team Project Plan Presentations
- M, 10/03: Team Project Plan Presentations
- W, 10/05: Career Gallery

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.ppt
- Dr. D. Will Combine Into Single PowerPoint
  - To Speed Things Up During Meeting
- Each Team Presents
  - Using Dr. D’s Laptop
  - At Most 5 Minutes (Rehearse Timing)
  - Single or Multiple Presenters (Your Choice)

09/19: Resume Writing and Interviewing

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