



01/19: Project Schedule and Risk

The Capstone Experience



Dr. Wayne Dyksen  
Department of Computer Science and Engineering  
Michigan State University  
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Project Schedule and Risk

- Risk
  - Project Schedule
  - Teamwork



Identifying Risks

- What You Don't
  - Know What are you worried about?
  - Understand
  - Know How to Do What should you be worried about?
- Normally
  - Major Project Features
  - "Showstoppers"
- Varies From
  - Not Familiar With But (Probably) Can Learn to
  - Absolutely No Idea How to Do It



Example Risks

- Including but not limited to...
- Key Application Features
  - Hardware Systems
  - Software Systems
  - Development / Programming Environments
  - Programming Languages
  - Etc...

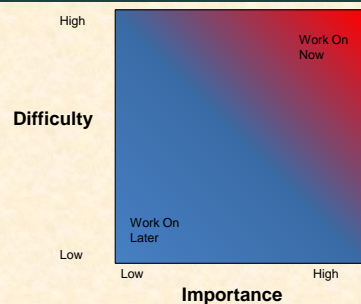


Prioritizing Risks

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



Prioritizing Risks





### 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

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### Basketball App Architecture

**Basketball Playing/Resting Time**

```

    graph TD
      A[Play/Rest Time Application] <--> B[Visual Basic]
      B <--> C[MS Access]
      C <--> D[Windows Vista Tablet PC]
  
```

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### 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?

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### 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

*Nota Bene:*

1. Check license if including in project.
2. Document.
3. Inform client.

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### Basketball App Risk Mitigation

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

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### Capstone Examples

- Team Auto-Owners
- Team Boeing
- Team Chrysler
- Team Dow
- Team GE Aviation
- Team Medtronic
- Team Meijer
- Team Motorola Mobility
- Team Raytheon
- Team Sparrow
- Team TechSmith
- Team Urban Science

**What are your risks?**

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## Project Schedule and Risk

- ✓ Risk
- Project Schedule
- Teamwork

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## 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?

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## Major Milestones

- 01/10: Course Overview
- 01/12: Project Plan
- 01/17: (Martin Luther King Day, No Meeting)
- 01/19: Project Schedule and Risk
- 01/24: Team [Status Reports](#)
- 01/26: Prototyping
- 01/31: Team [Project Plan Presentations](#)
- 02/02: Team [Project Plan Presentations](#)
- 02/07: Team [Project Plan Presentations](#)
- 02/09: Team Project Plan Presentations
- 02/14: Resume Writing and Interviewing
- 02/16: Creating and Giving Presentations
- 02/21: Team [Alpha Presentations](#)
- 02/23: Team [Alpha Presentations](#)
- 02/28: Team [Alpha Presentations](#)
- 03/02: Team [Alpha Presentations](#)
- 03/07: (Spring Break, No Meeting)
- 03/09: (Spring Break, No Meeting)
- 03/14: [Design Day](#) and the [Project Videos](#)
- 03/16: Camtasia Demo
- 03/21: Team Status Reports
- 03/23: Team Status Reports
- 03/28: Team Status Reports
- 03/30: Team Status Reports
- 04/04: Team [Beta Presentations](#)
- 04/06: Team [Beta Presentations](#)
- 04/11: Team [Beta Presentations](#)
- 04/13: Team [Beta Presentations](#)
- 04/18: Ethics and Professionalism
- 04/20: Intellectual Property and Copyright
- 04/25: Team [Project Videos](#)
- 04/27: Team [Project Videos](#) and All Deliverables
- 04/28: [Design Day](#) Setup
- 04/29: [Design Day](#)
- 05/03: Team [Project Videos](#)

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## 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

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## 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?

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## 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

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### 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

High Priority Risks Get High Priority Scheduling

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### 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)

} Can Be Serious Problem

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### 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 Stephen
  - Identify Slippage
  - Hold Each Other Accountable (or Contact Stephen or Me)
  - Set Corrective Action
  - Adjust Schedule

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### Project Schedule and Risk

- ✓ Risk
- ✓ Project Schedule
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### 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

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### Team Dynamics

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

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### Grading (1 of 3)

- Team (70%)
  - Project Plan Document & Presentation 10
  - Alpha Presentation 10
  - Beta Presentation 10
  - Project Video 10
  - Project Software & Documentation 25
  - Design Day 5
  - Total 70
- Individual (30%)
  - Technical Contribution 10
  - Team Contribution 10
  - Team Evaluation 5
  - Meeting Attendance 5
  - Total 30

### Grading (2 of 3)

- Final Grade Sum Of...
  - Individual Total
  - % of Team Total Based on Team Contribution
- Grand Total =
 
$$\begin{aligned} & \text{(Individual Total)} \\ & + \\ & \text{(Team Total) * (Team Contribution) / 10.0} \end{aligned}$$
- *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
  - and
  - 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 Stephen Next but ASAP (Don't Wait)
- "Bad" Team Not an Acceptable Excuse

} Potential For Bad Effect on 70% of Your Grade

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### Project Schedule and Risk

- ✓ Risk
- ✓ Project Schedule
- ✓ Teamwork

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### What's next?

- Team Status Report
  - [PowerPoint Template](#)
  - Due Midnight, Sunday, January 23
  - 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
  - Do NOT Modify Master Slide Page
- Each Team Presents
  - Using Dr. D.'s Laptop
  - At Most 4 Minutes (Rehearse Timing)
  - Single or Multiple Presenters (Your Choice)

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**MICHIGAN STATE UNIVERSITY**

01/26: [Prototyping](#)

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Dr. Wayne Dyksen  
Department of Computer Science and Engineering  
Michigan State University  
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From Students...  
...To Professionals