09/01: Capstone Overview

The Capstone Experience

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Capstone Overview

Course Logistics

- Client Projects
- Course Logistics (Continued)

CSE 498, Collaborative Design

- “The Capstone Course”
- Instructors
  - Dr. Wayne Dyksen (“Dr. D.”)
  - Stephen Paslaski
- Class Meetings
  - MW, 3:00-3:50pm, 2245 EB
- Course Web Site
  - capstone.cse.msu.edu
  - Check it often.

Course Goals

- Work in a Team Environment
- Build a Significant Software System
- Use (New) Tools and Environments
- Build and Administer Systems
- Develop Your Communication Skills
- Develop Interview Talking Points
- Etc...

Team Course Goal

- Build Large Software Project
  - Design
  - Architect
  - Develop
  - Test
  - Document
  - Deliver
  - For Client
  - Ex Nihilo (Out of Nothing)
  - In 15 (Short) Weeks

Project Deliverables

- Project Plan Presentation & Document
- Alpha Presentation
- Beta Presentation
- Project Software & Documentation
- Project Video
- Design Day
See Major Milestones.
All-Hands Meetings

• Presentations By
  • Professor
  • Teams
    • Status Reports
    • Formal Presentations
      o Project Plan
      o Alpha
      o Beta
    • Project Videos
    • Guest Speakers

All-Hands Meeting Agendas

• 09/01: Capstone Overview
• 09/06: (Labor Day, No Meeting)
• 09/08: Project Plan
• 09/13: Project Schedule and Risk
• 09/15: Team Status Reports
• 09/20: Prototyping
• 09/22: Resume Writing and Interviewing
• 09/27: Team Project Plan Presentations
• 09/29: Team Project Plan Presentations
• 10/04: Team Project Plan Presentations
• 10/06: Career Gallery
• 10/11: Creating and Giving Presentations
• 10/13: Design Day and the Project Videos
• 10/18: Team Alpha Presentations
• 10/20: Team Alpha Presentations
• 10/25: Team Alpha Presentations
• 10/27: Team Alpha Presentations
• 11/01: Careers
• 11/03: Team Status Reports
• 11/08: Team Beta Presentations
• 11/10: Team Beta Presentations
• 11/15: Team Beta Presentations
• 11/17: Team Beta Presentations
• 11/22: Team Status Reports
• 11/24: Team Status Reports
• 11/26: Ethics and Professionalism
• 11/29: Intellectual Property and Copyright
• 12/06: Team Project Videos
• 12/08: Team Project Videos and All Deliverables
• 12/12: Team Alpha Presentations
• 12/14: Team Alpha Presentations
• 12/15: Team Project Videos

CSE498 Lab

• 3352 EB
• Door Lock
• Electronic Keypad
  • Code = Batman
• Systems
  • Two PC’s per Team
    o Server
    o Development Machine
  • Team 100% Responsible
    o Building
    o Maintaining
    o Securing
    o Backing Up
• Books

Conference Area
  • Client Conference Calls
  • Google Calendar
Appliances
  • Refrigerator
  • Microwave
  • Coffee Maker
  • Lockable Storage

Scheduled Lab Times

• No Formal Lab Sessions
• “Credit” for Scheduled Weekly Meetings
  • Team Meeting
  • Client Conference Call
  • Triage Meeting with Stephen
  • Meeting Times TBA With
    • Team
    • Client
    • Stephen
• Students must be available to meet.

Capstone Overview

✅ Course Logistics

➢ Client Projects

• Course Logistics (Continued)

Team / Project Generalities

• Clients
  • Vary in Size and Type
  • Client contacts/mentors are “volunteers”.
• Team Contact Person
  • Picked By Team
  • Main Point of Contact for Client
Team / Project Generalities

- Project Level of Difficulty
  - Hard Enough
  - But Not too Hard
- Deliverable
  - To the Client
  - By the Due Date
- Documentation
  - System Administrator Manual
  - User Manual

Challenges
- Very Short, Unforgiving Time Line
- Client Contact
- Team Dynamics
- Project Plan (in Three Weeks)
- Entirely New...
  - Languages
  - Environments
  - APIs
  - SDK’s
  - Processes
  - Protocols
  - Etc.
  - Project Management
  - Etc...

Team / Project Generalities

Project Specifics

- Vary
  - Type
  - Current State of Specificity
- Challenge
  - Connect with Client
  - “Nail Down” the Project
    - Hard Enough
    - Not too Hard
    - Avoid Feature Creep
  - Course Feature, Not Bug

Project Teams/Clients

- Team Auto-Owners
- Team Boeing
- Team GE Aviation
- Team Ford
- Team Medtronic
- Team Meijer
- Team Motorola
- Team TechSmith
- Team Urban Science

Team Auto-Owners Insurance
Project Overview

Agent Multimedia Ad Builder
- Build Auto-Owners Advertisements
- Customized By and For Independent Agents
- Utilize Corporate Templates
- Support Multimedia
  - Print
  - Radio
  - Television
  - Web
- Features
  - Upload Text, Photos, Images, Video
  - Save / Open
  - Edit
  - Preview / Produce
- Technologies
  - .NET Framework
  - Microsoft Visual Studio 2010
  - Multimedia

Project Overview

Team Boeing

O-Show for Simulation Software
- Simulation Software
- Used For Training
- Examples Include Flight and Urban Combat
- Ultimate “Games”
- Optimize (O)
- Use of Limited Resources in Simulation
- Based on Weighted Priorities
- Apply Mixed Integer Linear Programming
- Show
  - Visualize Resources and Priorities
  - Interface to Simulation Software
  - Visualize Results of Optimization
- Technologies
  - Linux
  - C/C++ / Perl
  - OpenGL (MILP)
  - OpenSceneGraph (OSG)
Team **Ford**

**Project Overview**

**Ford Idea Place Mobile Edition**
- **Ford Idea Place**
  - Collect Innovative Ideas from Ford Employees
- **SharePoint Based Intranet Site**
  - Enhancements in Intranet Site
- **Mobile Edition**
  - Collect Ideas Anytime from Anywhere
  - iPhone, Android Apps
  - Store Ideas in the Cloud
  - Share Between Users
- **Innovative Ideas App Features**
  - Submit, View, Search, Rate, Comment
  - Share (Push to Users, Categories, Etc.)
  - Subscribe (Pull from Users, Categories, Etc.)
  - Show Context (Location, Photo, Video)
- **Technologies**
  - iPhone, Objective C, Software Development Environment
  - Android Software Development Environment
  - Microsoft Sharepoint Services

Team **GE Aviation**

**Project Overview**

**Super Synoptics**
- **Pilot Tasks**
  - Acquire
  - Navigate
  - Communicate
  - Manage Systems
- **Develop Innovative Management System**
  - Show Aircraft Systems Status and Performance
  - Leverage Graphics and Graphical Displays
- **Sample Synoptics**
  - Engine Parameters
  - Fuel, Hydraulic, and Electrical Systems
  - Lifting, Trimming, and Airframe Configuring Systems
- **Environmental Control Systems**
  - Pneumatic and Anti-Ice Systems
- **Technologies**
  - X-Plane
  - Camtasia Studio-Synoptics Display, Fall 2009
  - Capstone Lateral Map Display, Spring 2010
  - Dyes GL, 3D Studio

Team **Medtronic**

**Project Overview**

**Wellness Applications for Medtronic Patients**
- Help Patient Manage Health
  - Monitors Objective Measurements
  - Shows Effect of Behaviors and Choices
- **Web App**
  - Create and Track Goals
  - Provide Feedback on Health and Wellness
  - iPhone App
  - Track Caloric intake and Expenditure
  - Suggest Exercise and/or Food Consumption
  - Accept Input from Medtronic Monitoring Devices
  - Carbox Monitor
  - Glucose Monitor
- **Technologies**
  - iPhone, Objective C, Software Development Environment
  - Android, Java, JavaFX
  - Grails (Java-Based Framework)
  - Web Services with Microsoft HealthVault
  - Capstone Mobile Health Management System, Spring 2010

Team **Meijer**

**Project Overview**

**ITS Products and Services Request System**
- **ITS**
  - Information Technology Services
  - Provides All of Meijer IT Services
  - Network Infrastructure
  - Database
  - Logistics and Supply Chain
  - Cloud of Gift Systems
  - More
- **Products and Services Request System**
  - SharePoint Web Application
  - Supports
  - Catalog of Products and Services
  - Request Submission, Routing, and Tracking
- **Technologies**
  - Microsoft SharePoint 2007
  - Visual Studio 2008
  - Microsoft SQL Server 2008
  - Microsoft Office 2007

Team **Motorola**

**Project Overview**

**Enhanced Program Guides for Mobile Devices**
- **Program Guides**
  - For TV and Internet Content
  - Provide Limited Information
  - Enhanced Program Guides
  - For Same TV and Internet Content
  - Provide Enhanced Information
  - More Biographies
  - Sponsorship of Access on Fall Shows
  - Access to Extras in Shows
- **Mobile Devices**
  - Enhanced Information
  - Android and Symbian Mobile Devices, Multiple Devices
  - Web Services in Multiple layers
- **Technologies**
  - iPhone, iPad, Objective C, Software Development Environment
  - Android-Open Software Development Environment
  - NREML Web Services
  - Java
  - Web Development (HTML, JavaScript, Google Web Toolkit)

Team **TechSmith**

**Project Overview**

**Extending Apps using Cloud Asset Sharing**
- **TechSmith App Assets**
  - Stored on "Local" Disk
  - Sync
- **Snagit**
  - Screenshots
  - Captures
  - Screenshot Management
- **Camtasia Studio**
  - Captures
  - Title Requirements
  - Import/Export Segments
- **Enable App Asset Sharing**
  - Store in the Cloud
  - Share Between Users
  - Workgroup
  - Company
- **Technologies**
  - Microsoft
  - FST, XML, Windows Presentation Foundation
  - TechSmith
  - Snagit
  - Captions

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Team **Urban Science**  
Project Overview

Modern Online Analytical Processing Cube
- OLAP Cube  
  - Database Querying Tool  
  - Enables Rapid  
    - Database Field Selection  
    - Multidimensional Data Analysis  
    - Visualization and Report Generation  
- Current Product Limitations  
  - Usability  
  - Scalability  
  - Functionality  
- Modern Cube Requirements  
  - Easy-to-Use User Interface  
  - Scalable Database Architecture  
  - New Urban Science Specific Functionality  
- Technologies  
  - Contour Cube  
  - Dundas OLAP Cube  
  - SQL Database  
  - Microsoft Silverlight

**First Assignments**

- Read the Syllabus  
- Check out the Lab  
  - See if you can find it.  
  - See if you can get in.  
- Check out the Web Site  
- Research Your  
  - Client  
  - Project Technologies

**What’s Next?**

- Teams  
  - Assignments by Email Tonight  
  - Meet Initially by Friday Afternoon  
  - Lab Machine Assignments in Lab  
  - Start Configuring Lab Machines  
  - Team Photos Wednesday After All-Hands Meeting  
- Client  
  - Contact by Email by Friday Afternoon  
  - Contact by Phone Tuesday or Wednesday  
  - Review Project Proposal

**Capstone Overview**

- Course Logistics  
- Client Projects

  - Course Logistics (Continued)

**Course Environment**

- Business-Like  
- Team  
  - External Software Development Company  
  - Internal Software Development Team  
- Dyksen & Paslaski  
  - Are Your  
    - External Paying Clients  
    - Internal Managers  
  - Expect Results  
    - On Time  
    - No Excuses

**Expectations & Workload**

- Extremely High For Both  
- Your MSU Career Capstone  
- Addition to Your Personal Portfolio  
- Experience Viewed Like an Internship  
- Interview Talking Points  
- Leverage Into a Job Offer
**Major Milestones**

- 09/15: Status Reports
- 09/27: Project Plan Presentations
- 10/11: Alpha Presentations
- 11/08: Beta Presentations
- 12/06: Project Videos
- 12/08: All Deliverables
- 12/09: Design Day Setup
- 12/10: Design Day

**Meeting Attendance**

- Required
  - All-Hands (Class) Meetings
  - Team Triage Meetings
  - 5% of Final Grade
  - Late == Absent
  - Almost No Excuses Accepted
  - One or Two Excused Possible for Interviews
  - Must Provide Information in Advance (Date, Company, Recruiter Name & Contact Info)
  - Must Attend (No Excuses Accepted)
  - Your Team Presentations
  - All Final Project Video Viewing
  - Design Day

**Team Organization**

- Up to Each Team
- Organize into Roles
  - Client Contact
  - Program Manager
  - Developer
  - Tester
  - Systems Administrator
  - 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 Stephen
- Be Ready to Discuss During Interviews

**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 =
    - (Individual Total) +
    - (Team Total) * (Team Contribution) / 10.0
- **Nota Bene**: Your Team Contribution will have a very significant effect on your final grade.
Grading (3 of 3)

• We reserve the right to make changes with sufficient notice.
• No special consideration will be given for final grades including but not limited to
  • status in any academic program including CSE,
  • financial aid,
  • rank in the armed forces,
  • job,
  • graduation,
  • mortgage,
  • wedding, or
  • visa status.

Integrity of Scholarship

• MSU’s policies will be enforced.
• Individual and team work must be original.
• Violators...
  • will be referred to the appropriate deans.
  • may receive a grade of F in the course.

IP & NDA’s

• IP: Intellectual Property
  • By Default, Owned by You
  • Client May Request
    ○ Right to Use
    ○ Assignment of Ownership
    ○ Etc.
• NDA: Non-Disclosure Agreement
  • May Be Required by Client
  • You will...
    ○ ...respect/protect intellectual property.
    ○ ...respect/protect source code.
    ○ ...etc.
  • Normally Not an Issue

Using Resources

• Ok For “Help”
  ▪ People
    ○ Past Capstone Teams
    ○ Other Capstone Teams
    ○ Faculty Members
  ▪ Articles
  ▪ Sample Code
  ▪ Etc...
• Not Ok For “Entire” Project
• If Unsure, Ask Dr. D. and/or Stephen

Using Existing Code

• Ok
  • Examples
  • Prototypes
  • Open Source Code
    ○ Fragments
    ○ Libraries
    ○ Utilities
  • Not Ok
    ○ Vast Amounts of Your Project
    ○ Not Open Source
    ○ Document and Report All Existing Code Used
    ○ Be Careful!
    ○ If Unsure, Ask Dr. D. and/or Stephen

Design Day

• College of Engineering Event
  ▪ MSU Union
  ▪ Friday Morning, December 10
• Displays (Booths) of Design Projects
  ▪ CSE Capstone
  ▪ ECE Capstone
  ▪ ME Capstone
  ▪ Etc...
• Presentations and Awards
  ▪ Panel of Judges
  ▪ CSE Team Project Videos
**VISA**

- Verified Individualized Services and Accommodations
- Let us know immediately.
- We will work with you.

**Office Hours**

- Any Time...
  - Visit
  - Call
  - Send Email
  - Make Appointment

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