01/10: Capstone Overview

The Capstone Experience

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CSE 498, Collaborative Design

• “The Capstone Experience”
• Instructors
  • Dr. Wayne Dyksen (“Dr. D.”)
  • Stephen Paslaski
• Class Meetings
  MW, 3:00-3:50pm, 2400 EB
• Syllabus
• Web Site
  • capstone.cse.msu.edu
  • Check it often.

Course Goals

• Teams of Students
• Build Significant Software System
  • Design
  • Develop
  • Document
  • Deliver
• For Corporate Clients
• In 15 (Short) Weeks

Course Logistics

• Client Projects
• Course Logistics (Continued)

Project Deliverables

• Project Plan Document & Presentation
• Alpha Presentation
• Beta Presentation
• Project Software & Documentation
• Project Video
• Design Day
See Major Milestones.

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All-Hands Meetings

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

CSE498 Lab

- 3352 EB
- Door Lock
- Electronic Keypad
- Code = 4444
- Systems
  - Two PC's per Team
    - Server
    - Development Machine
  - Team 100% Responsible
    - Building
    - Maintaining
    - Securing
    - Backing Up
- Books

Conference Area
- Client Conference Calls
- Google Conference 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...

### Deliverable
- To the Client
- By the Due Date

### Documentation
- System Administrator Manual
- User Manual

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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

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Project Teams/Clients

- **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**

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Team **Auto-Owners Insurance**

**Project Overview**

Agent Multimedia Advertisement Builder

- Build Auto-Owners Advertisements
- Customized by and for Independent Agents
- Utilize Corporate Templates
- User Features
  - Upload Text, Photos, Images, Audio, and Video
  - Save, Open, Edit, Produce, and Submit
  - Shopping Cart
- Administrative Features
  - Manage User Profiles
  - Manage Ad Templates
  - Review Approve, and Track Ads
- Technologies
  - Java / Eclipse
  - Struts 2
  - OSG (Relational Database)

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Team **Boeing**

**Project Overview**

**BAPS: Battle Aircraft Position Share**

- 3D Game
- Two Teams
- Destroy Targets of Opposing Team
- Use Aircraft with Various Capabilities
- Features
  - Similar to Chess and Battleship
  - Variety of Targets, Radars, and Weapons
  - Weather
  - Network-Based with Encryption
- Technologies
  - C++ and Python
  - OpenSceneGraph (OSG)
  - Blender (3D Modeling)
  - Internetworking
  - Windows XP, Windows 7
Team **Chrysler**

**Project Overview**

**Fleet Auction Distribution and Sale Optimizer**

- Fleet
- Vehicles
- Group of Vehicles Can, Trucks, Etc.
- Dealership Companies, Wholesale, or Daily Rental Companies
- Valuation Yard
- Non-Private Vehicles
- Optimize Fleet Sales

**Features**

- Web Application
- Form and Map Interface
- Drag and Drop Vehicle from Site-to-Site
- Reverse Models and Forecast Reports

**Technologies**

- Java (or JavaScript)
- SQL (Database Structured Query Language)
- Google Maps

Team **GE Aviation**

**Project Overview**

**MSU Next Generation Flight Deck**

- Pilot Tasks
- Aviate
- Navigate
- Communicate
- Management Systems
- MSU Capstone Flight Deck, V1

**Features**

- Real-Time Weather
- User Interactivity
- Sensorless Motion
- Predictive Analytics
- AIRWaves

**Technologies**

- Java
- GWT
- Scalable Structured Query Language
- Google Maps

Team **Meijer**

**Project Overview**

**Consumer Payroll Check Cashing Analytics**

- Consumer Payroll Check Cashing Service
- In-Store AT Service Desk
- Users Must Enroll 7 Days in Advance
- Users Third-Party Authentication Service [Categorize]

**Features**

- Userfriendly Reporting Features
- Ad-Hoc Reports by Customer, Store, Date, Etc.
- Fraud Analytics
- Reports by Store, Group of Stores, and All Stores

**Technologies**

- Microsoft SQL Server 2008
- Microsoft SQL Server Reporting Services (SSRS)
- Microsoft Visual Studio 2010

Team **Motorola Mobility**

**Project Overview**

**Companion Authoring System**

- Enhanced Program Guides for Mobile Devices, Fall 2010
- Provide Enhanced Information
- Ad In-App System
- Automated Service Tiers
- Pushed to Mobile Devices
- Web Application

**Features**

- Project Extensions
- Lifecycle Management System
- Secondary Metadata
- Consumer Interactivity with Metadata

**Technologies**

- Java (Servlets, JSE)
- Web Services (RESTful)
- Web Development (XHTML, JS, CSS, JavaScript, Git)
- iPhone, iPad Development (Objective-C)
- Android Development (Java)
Team **Raytheon**

Project Overview

Radio Spectrum Analyzer for Mobile Platforms
- Optimize Use of Radio-Frequency Spectrum
- Identify and Analyze Used Frequency Ranges
- Recommend Frequency Range to Use
  - To Maximize Bandwidth and Minimize Noise
  - For Tuning and Controlling Military Radios
  - Based on Spectrum Allocation Policies
- Design Features
  - User Interface
  - Software to Manage Spectrum
- Platform Independent
  - Embedded Platforms (e.g., Radios)
  - Android Smartphones
  - Laptops and iPads
- Web Service to Manage Spectrum
  - Usage and Assignments
  - Allocation Policies
- Technologies
  - C, C++
  - Microsoft .NET
  - Java
  - SQL Databases
  - Web Application Programming

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Team **Sparrow**

Project Overview

iSupport Center
- Medical Informatics at Sparrow
  - 400+ Applications and Systems
  - Patient Medical Information
  - Schedules (Doctors, Patients, Operating Rooms)
  - Delivery-Critical (Matter of Life and Death)
  - Interoperable with Other Systems
- Support Center
  - Manage IT Systems and Services
  - Improve Reliability and Response Time
- Features
  - Catalogue
  - Maintain Licensing and Updates
  - Report, Assign, Track, and Resolve Problems
- Technologies
  - Microsoft .NET
  - Microsoft SharePoint
  - Microsoft SQL Server
  - Symantec Altris Management Suites

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Team **TechSmith**

Project Overview

WhiteCaps: Mobile Whiteboard Capture Solution
- TechSmith Screen Capture Solutions
  - Jing
  - Snagit
  - Camtasia
- Whiteboard Capture Solutions
  - Capture, Annotate, and Share
  - Via Mobile Phone and the Cloud
- Features
  - User Accounts
  - Upload, Share, Annotate, and View
  - Contextual Metadata
  - Location, Date, and Time
  - QR Codes
  - Content History and Notifications
  - Photo Deskewing and Stitching
- Technologies
  - Apple iOS iPhone SDK, C, Objective-C
  - Google Android JDK, Java
  - Microsoft .NET, C, WPF
  - Microsoft Azure Cloud Computing and Web Services

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Team **Urban Science**

Project Overview

Bringing LeadVision to the Web
- LeadTV
  - Visualization of Automotive Sales Leads
  - "TV" Model
    - Client-Based Application
  - Time Shifting
  - Zoom and Pan
- Web LeadTV
  - Browser-Based
  - Enhanced Capabilities and Usability
- Features
  - Customized Leads Visualized
  - By Brands and/or Models
  - By Top 5
  - Etc.
- Technologies
  - Web Application Programming
  - Java and/or Silverlight
  - SQL Databases

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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 **Project**
- Client
- Technologies

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What’s Next?

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

Course Logistics

Client Projects

Course Logistics (Continued)

Lab Stuff

Security
- Cabinets
- Doors

Food Stuff
- Coffee Maker
- Refrigerator
- Microwave

Machines
- Desktops
  - Running
  - Screen Saver
- Rack-Mounted
  - 1 Per Team
  - Talk with Stephen

Course Environment

- Business-Like
- Team
  - External Software Development Company
  - Internal Software Development Team
- Dr. D. & Stephen
  - 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

- 01/24: Status Reports
- 01/31: Project Plan Presentations
- 02/21: Alpha Presentations
- 03/21: Beta Presentations
- 04/25: Project Videos
- 04/27: All Deliverables
- 04/28: Design Day Setup
- 04/29: 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

Do NOT Schedule Interviews
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 05
  - Total 70
- Individual (30%)
  - Technical Contribution 10
  - Team Contribution 10
  - Team Evaluation 05
  - Meeting Attendance 05
  - 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.

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### 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...
    - 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. Dyksen and/or Stephen

### Using Existing Code

- **Ok**
  - Examples
  - Prototypes
  - Open Source Code
    - 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, April 29, 2011
- **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
    - 3149 EB
    - 411 Nat Sci
  - Call
    - EB: 353-5573
    - Nat Sci: 884-2469
  - Send Email ([dyksen@cse.msu.edu](mailto:dyksen@cse.msu.edu))
  - Make Appointment
## Capstone Overview

- Course Logistics
- Client Projects
- Course Logistics (Continued)

### Questions?

01/12: **Project Plan**

**The Capstone Experience**

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Spring 2010