The Computer Science Senior Capstone Experience

CSE498 Collaborative Design

Department of Computer Science and Engineering
Michigan State University
Spring 2009

Professor Wayne Dyksen

Course Objectives

- Complete a Large Software Project
 - Architect
 - Implement
 - Test
 - Document
 - Deliver
- For a Client
- From "Scratch"
- In 15 (Short) Weeks

Course Objectives

- Build and Administer Systems
- Use Advanced Tools And Environments

• Integrate Computer Science Knowledge

Course Objectives

- Work In A Team Environment
- Develop Communication Skills

Develop Interview Talking Points

All-Hands Meetings

- MW, 3:00-3:50pm, 2400 Engineering Building
- Presentations By
 - Professor
 - Teams
 - Status Reports
 - Alpha and Beta Demonstrations
 - Formal Presentations
 - Project Videos
 - Guest Speakers

All-Hands Meeting Agendas

01/12: Course Overview / Course Inventory

01/14: Project Plan / Team Assignments

01/19: (Martin Luther King Day, No Meeting)

01/21: Project Schedule & Risk

01/26: Teams: Status Reports

01/28: Prototyping

02/02: Teams: Technical Specifications / Schedule

02/04: Teams: Technical Specifications / Schedule

02/09: Teams: Technical Specifications / Schedule

02/11: Teams: Technical Specifications / Schedule

02/16: Resume Writing & Interviewing

02/18: Creating & Giving Presentations

02/23: Teams: Alpha Demonstrations

02/25: Teams: Alpha Demonstrations

03/02: Teams: Alpha Demonstrations

03/04: Teams: Alpha Demonstrations

03/09: (Spring Break, No Meeting)

03/11: (Spring Break, No Meeting)

03/16: The Project Video

03/18: Camtasia Demo

03/23: Teams: Status Reports &/or Demos

03/25: Teams: Status Reports &/or Demos

03/30: Teams: Beta Demonstrations

04/01: Teams: Beta Demonstrations

04/06: Teams: Beta Demonstrations

04/08: Teams: Beta Demonstrations

04/13: Teams: Status Reports &/or Demos

04/15: Ethics and Professionalism

04/20: Teams: Status Reports &/or Demos

04/22: Intellectual Property and Copyright

04/27: Teams: Project Videos

04/29: Teams: Project Videos

04/30: Design Day Setup

05/01: Design Day

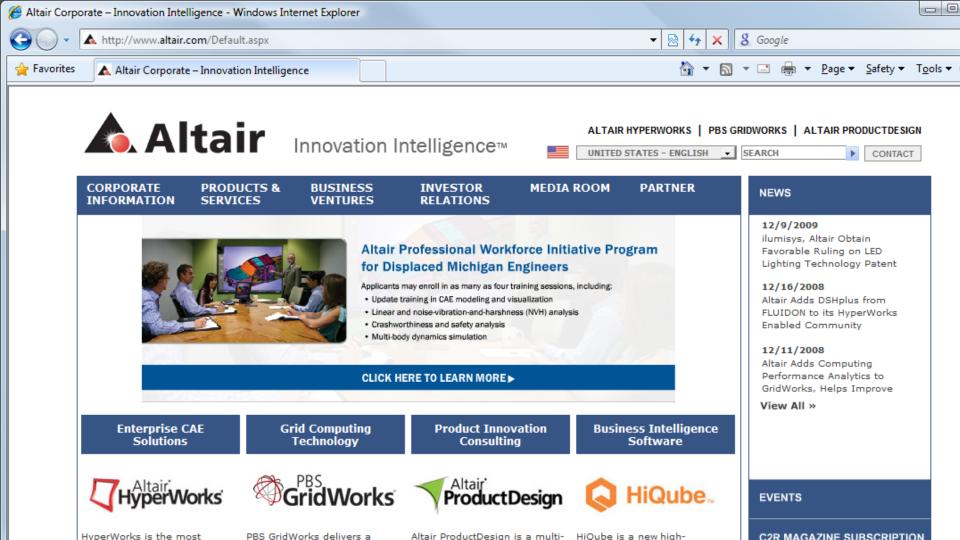
05/07: Teams: Project Videos

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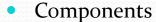


Team 1. Altair Engineering

Project Overview

U₃D Object Rendering Java Applet

- View 3D Computer Aided Design (CAD) Objects
 - View Large CAD Assemblies
 - Render with Lighting and Shading
 - Select Parts of Interest
 - View Both Original Assembly and Selected Parts
 - Export Parts List to XML



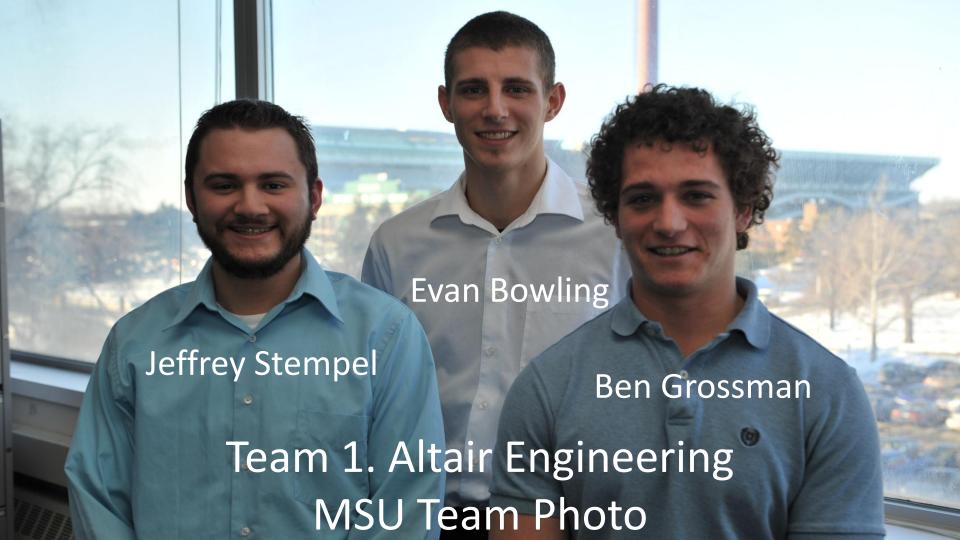
- Import CAD File (UG, CATIA, V₄/V₅, SolidWorks, SolidEdge, Inventor)
- Convert to Universal 3D (U3D) and Render
- Export Subassemblies to XML
- Technologies

Java

- CAD
- U₃D (Universal ₃D)

- OpenGL
- Web Services

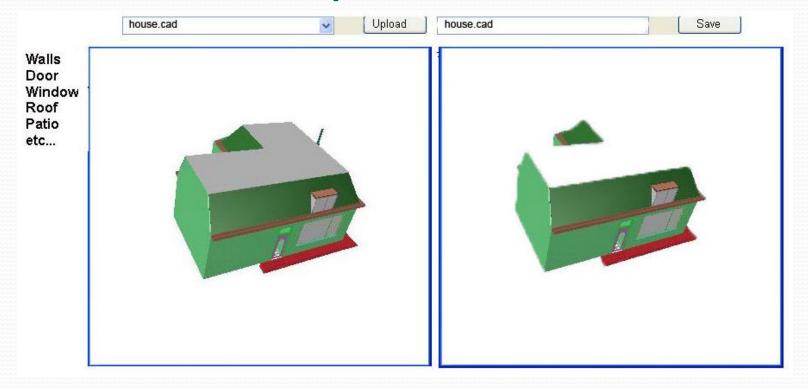






Team 1. Altair Engineering

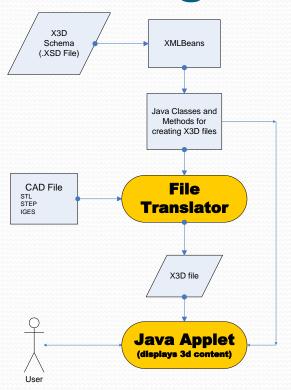
Screen Mockup





Team 1. Altair Engineering

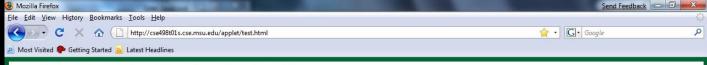
Architecture Diagram



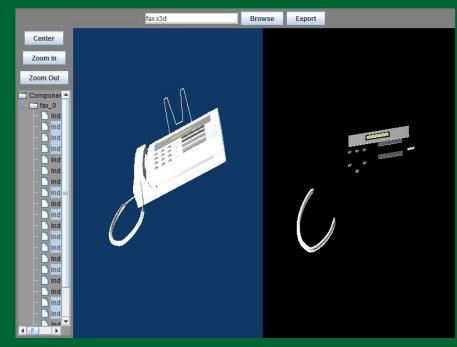




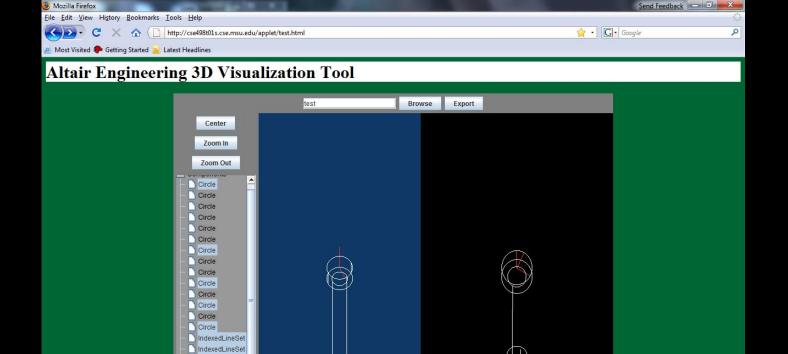




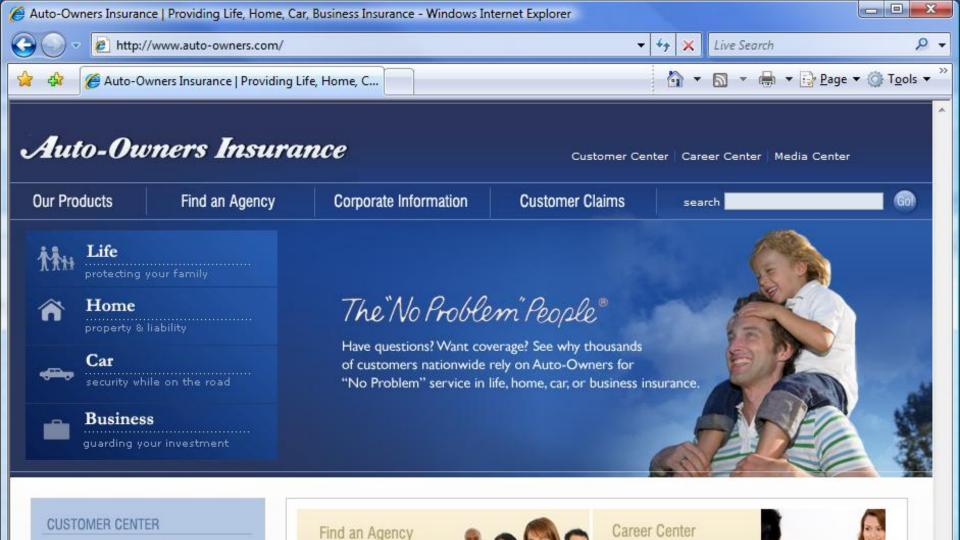
Altair Engineering 3D Visualization Tool







IndexedLineSet
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IndexedLineSet
IndexedLineSet
IndexedLineSet



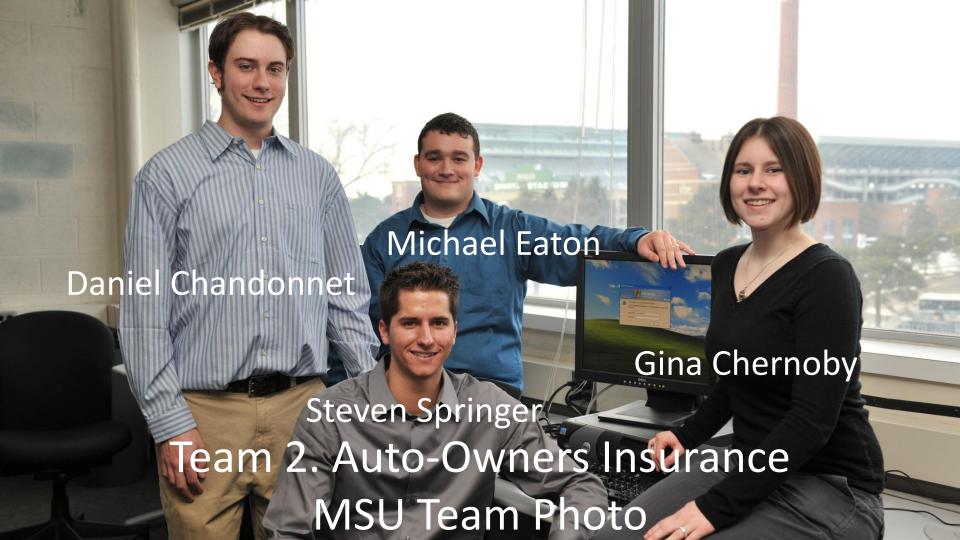
Team 2. Auto-Owners Insurance

Project Overview

Telephone Log Self-Service Dashboard

- Dashboard for Telephone Call Log
 - Used by Managers
 - Daily, Weekly, Monthly Thresholds
 - User Customizable
- Automatic Determination of...
 - Management Hierarchy
 - Caller/Callee ID from
 - Internal Phone System
 - Agency/Branch System
 - White/Yellow Pages via Web Services
- Technologies
 - Javascript
 - Sequel Server Database
 - Web Services
 - Etc...







Team 2. Auto-Owners Insurance Screen Mockup

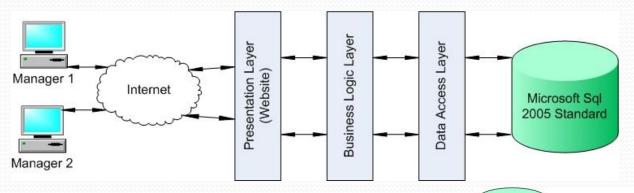
Auto-Ou	ners Insuran	ıce	Customer Center C	areer Center Media Cente	r
Home		View Logs		John Smith	Logout
	TEI	LEPHONE LO	OG SERVICE		
THRESH	OLDS				
BUS	SINESS		NON - BUSINESS		
)	Minutes		Minutes		
	Quantity:		Quantity:		
	Local		Local		
	Long Distance		Long Distance		
	Cost		Cost		
		SAVE THRES	SHOLDS		
	Auto-Ove	HOME EDIT THRESHOLDS	, VIEW LOGS All Rights Reserved, <u>terms of use</u>		

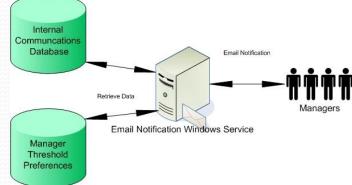


The CSE Senior Capstone Experience

Team 2. Auto-Owners Insurance

Architecture Diagram







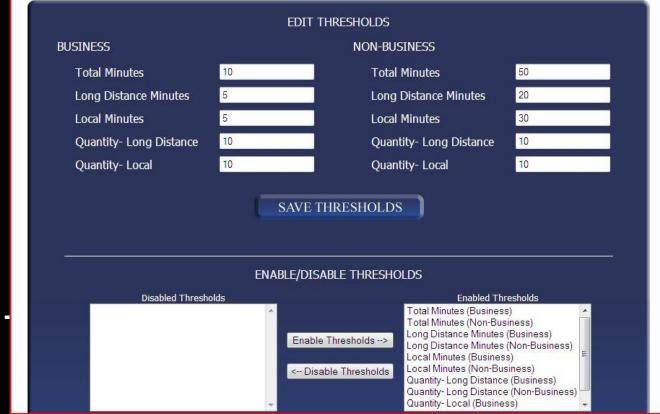
Auto-Owners Insurance Home Preferences View

TELEPHONE LOG SERVICE

spring62

Logout

View Logs





TELEPHONE LOG SERVICE

GO

View: All

CALL ACTIVITY

Direction	Source	Destination	Duration	Date	Business	Local
IN	478-987-8000	McCormack, Lynnette	132 mins	7/25/2008 9:59:48 AM	No	No
OUT	Cutler, Thanh	927-6793	468 mins	7/25/2008 9:59:12 AM	No	Yes
IN	813-754-7766	Ramirez, Larissa	6 mins	7/25/2008 9:58:54 AM	No	No
IN	810-625-3739	Pruitt, Gino	246 mins	7/25/2008 9:55:54 AM	No	No
OUT	Pruitt, Gino	1-517-914-4647	30 mins	7/25/2008 9:52:30 AM	No	Yes
132300		T 200 (200) 200 (200) 200 (200)	100000000000000000000000000000000000000		5000000	Tex (3.5.33.7

IN	813-754-7766	Ramirez, Larissa	6 mins	7/25/2008 9:58:54 AM	No	No
IN	810-625-3739	Pruitt, Gino	246 mins	7/25/2008 9:55:54 AM	No	No
OUT	Pruitt, Gino	1-517-914-4647	30 mins	7/25/2008 9:52:30 AM	No	Yes
IN	517-290-1397	Skaggs, Alva	6 mins	7/25/2008 9:50:54 AM	No	Yes
IN	517-290-1397	Skaggs, Alva	6 mins	7/25/2008 9:50:00 AM	No	Yes
EXTI	Coulter, Claudine	Gregg, Malcom	24 mins	7/25/2008 9:49:37 AM	Yes	Yes
EXTI	France, Concepcion	Carey, Lisa	132 mins	7/25/2008 9:47:49 AM	Yes	Yes
EXTI	8817	Shirley, Virgilio	18 mins	7/25/2008 9:46:43 AM	Yes	Yes
OUT	Ramirez, Larissa	1-813-754-3561	186 mins	7/25/2008 9:43:54 AM	No	No
EXTI	Skaggs, Carissa	Pruitt, Gino	6 mins	7/25/2008 9:43:01 AM	Yes	Yes
IN	517-204-3927	Simpson, Hanna	60 mins	7/25/2008 9:42:00 AM	No	Yes
EXT	Snell, Maribel	Booth, Ada	24 mins	7/25/2008 9:41:36 AM	Yes	Yes
EXT	Ramirez, Larissa	3114	120 mins	7/25/2008 9:41:00 AM	Yes	Yes
IN	262-377-6063	McCormack, Lynnette	72 mins	7/25/2008 9:38:48 AM	No	No
OUT	Ramirez, Larissa	1-515-274-3838	144 mins	7/25/2008 9:38:36 AM	No	No
OUT	Pruitt, Gino	882-3732	408 mins	7/25/2008 9:37:12 AM	No	Yes
IN	813-754-8502	Ramirez, Larissa	90 mins	7/25/2008 9:36:30 AM	No	No
IN	765-641-2754	Chase, Luz	162 mins	7/25/2008 9:35:18 AM	No	No
10						



Auto-Owners Insurance

Home

Manager Information Preferences

chernob1 Logout

TELEPHONE LOG SERVICE

Associate details for Willa Cannon

View Loas

Destination

272-2323

Blackwell, Twila

Duration

1:54

0:54

RECENTLY EXCEEDED THRESHOLDS

Non-business minutes

Business minutes: 31

Local business minutes: 31

Long-distance business minutes: 0

Number of local business calls: 23

Number of long-distance business calls: 31

Source

Cannon, Willa

Cannon, Willa

PHONE USAGE SUMMARY

CALL ACTIVITY Direction

OUT

EXT

Local non-business minutes

Type of Threshold

Long distance non-business minutes

Non-business minutes: 189

Local non-business minutes: 75

Long-distance non-business minutes: 114

Number of long-distance non-business calls: 189

Date

7/25/2008 8:28:06 AM

7/25/2008 9:14:06 AM

Number of local non-business calls: 34

Exceeded By

25 minutes

63 minutes

88 minutes

Business Local

Yes

Yes

No

Yes



Auto-Owners Insurance

Home Manager Information Preferences View Logs chernob1 Logout

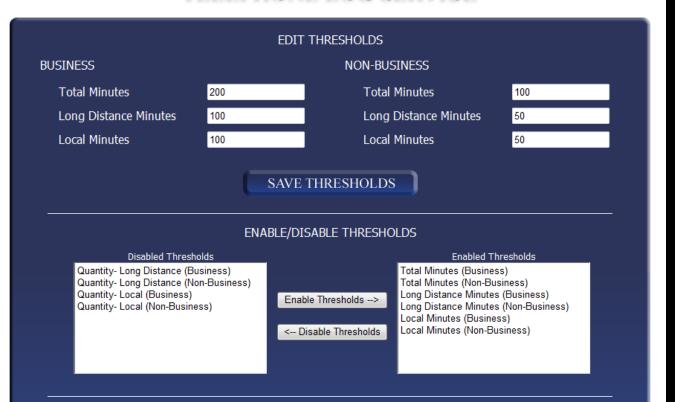
TELEPHONE LOG SERVICE

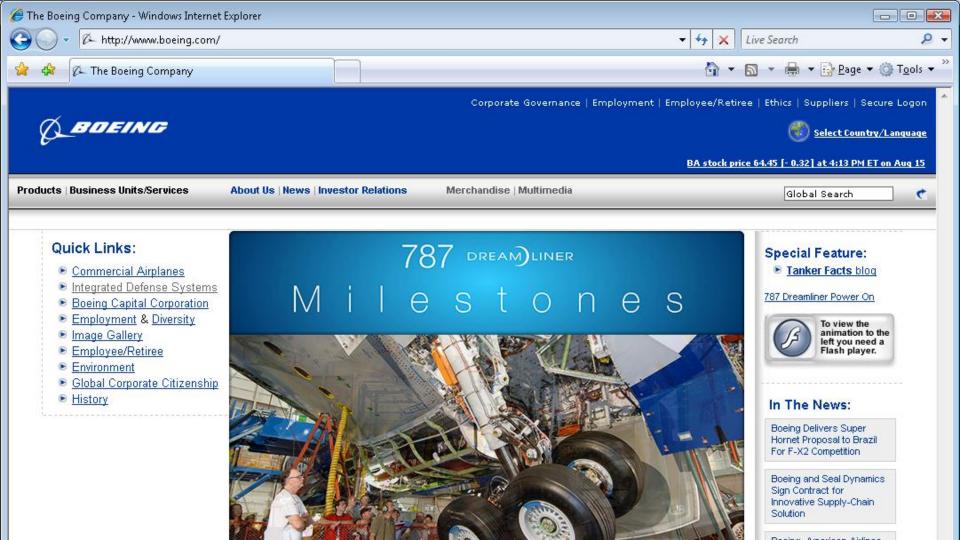
Please select a unit to view associa	ates for: MAILSTAR OPERATIONS
<u>Name</u>	Extension
Bernard, Kelly	
Cannon, Willa	323-8722
Carey, Lisa	327-4887
Combs, Ana	
Cutler, Thanh	327-4821
Delong, Johanna	
Downing, Orlando	
Fischer, Hollie	
Gregg, Malcom	323-8746
Lovell, Giuseppe	
Malaca Faulaus	222.0762

Auto-Owners Insurance

Home Manager Information Preferences View Logs chernob1 Logout

TELEPHONE LOG SERVICE





Team 3. Boeing

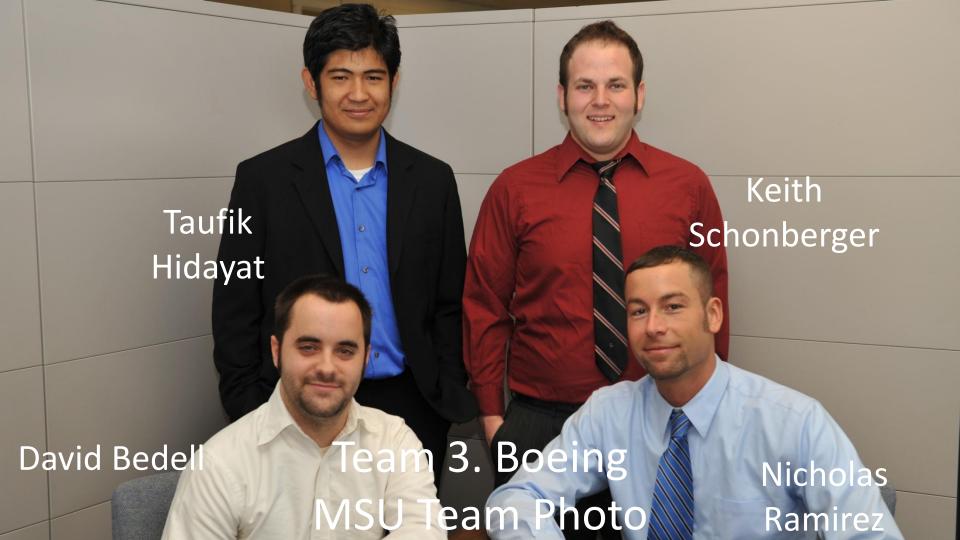
Project Overview

KML Urban Scene Builder 2009 (KMLUSB 2009)

- System for 3D Geometrical Scene Building
 - To Be Used by Boeing Phantom Works
 - Provide Scenery for Boeing Simulation Software
- Built On KMLUSB 2008
- Features
 - Advanced Urban Scenery Fidelity
 - Advanced COLLADA Model Viewer (CMV)
 - DIS Building Simulation (DBS)
 - Unmanned Vehicle Capability
 - On-Demand Load Capability
- Technologies
 - Google Earth
 - OpenGIS® KML Encoding Standard (OGC KML)
 - LUA 3-D Model Scripting



- COLLADA
- Distributed Interactive Simulation (DIS)





Team 3. Boeing

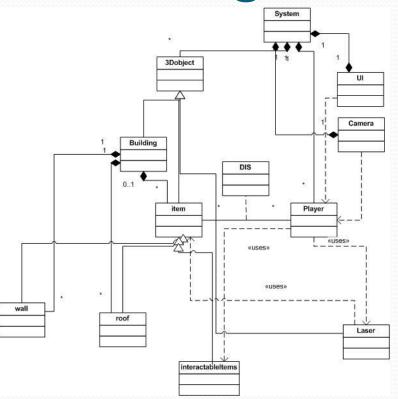
Screen Mockup





Team 3. Boeing

Architecture Diagram













Team 4. Ford

Project Overview

Ford Conference Room Monitor

- Web-Based Conference Room Utilization Monitoring System
 - Real-Time Utilization Information
 - Captured by Wireless Sensors
 - Level of Light and Timestamp of Light Change
 - Room Temperature
 - Transported via Mesh Network
 - Stored in Database
 - Monitored via Web Applications
- Deliverables
 - Sensor Capture and Mesh Network
 - Data Storage and Analysis
 - Web Applications
- Technologies
 - Crossbow iMote2 Wireless Sensors
 - Wireless Mesh Networks



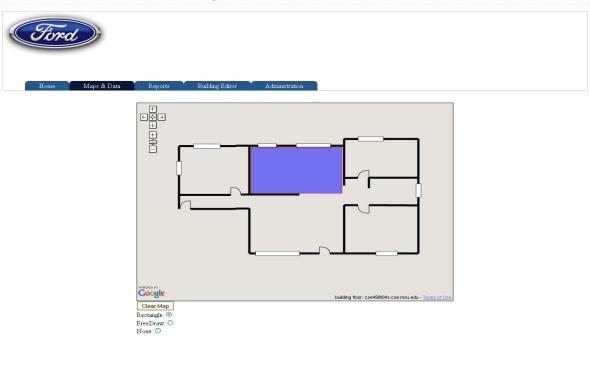
Microsoft .NET Micro Framework





Team 4. Ford

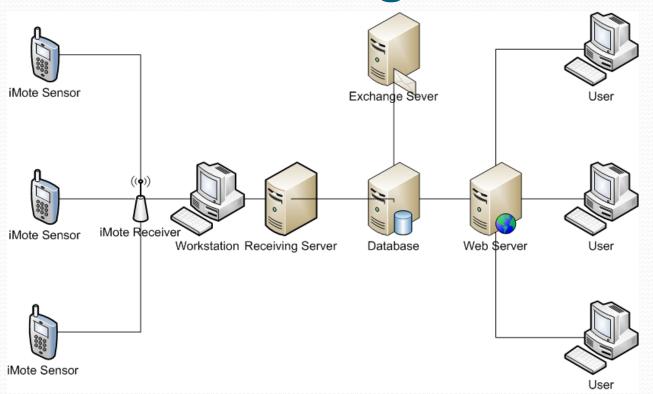
Screen Mockup





Team 4. Ford

Architecture Diagram

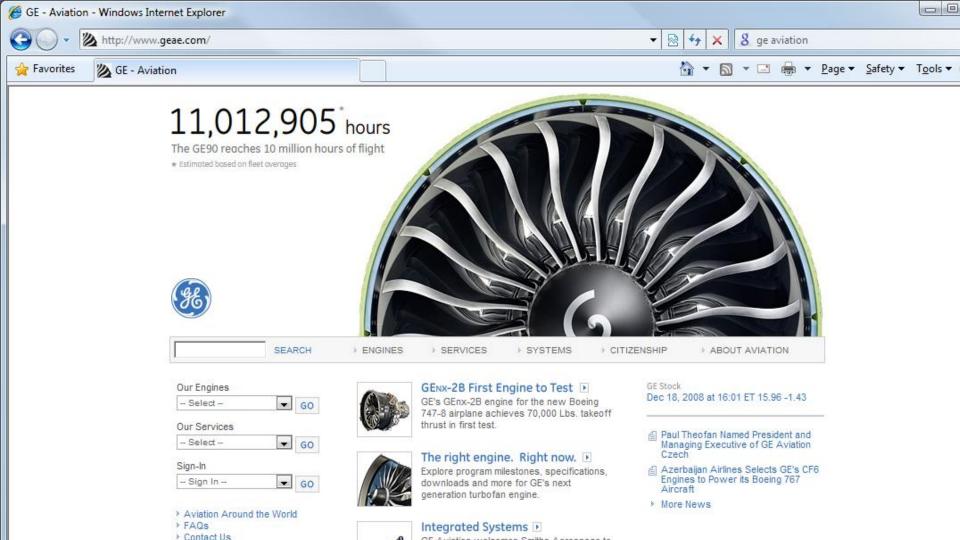












Team 5. GE Aviation

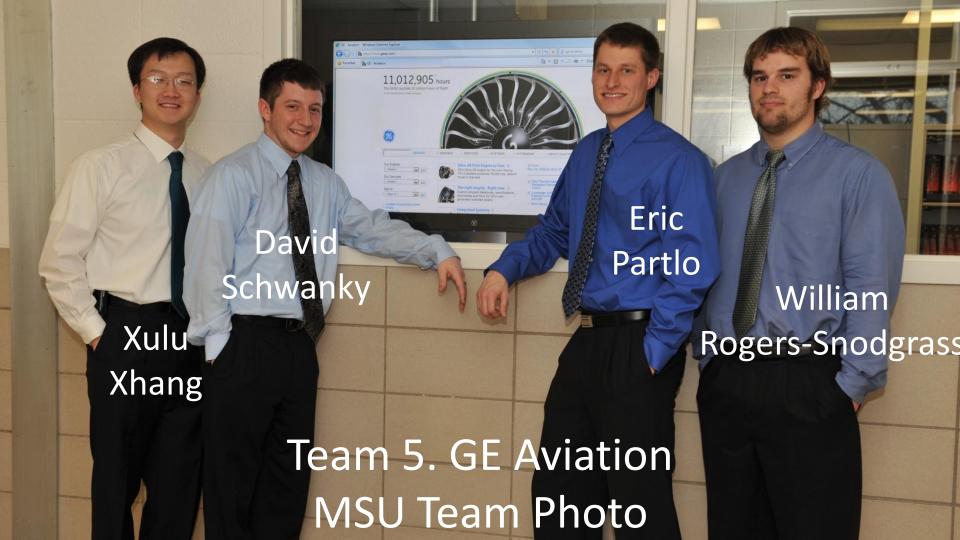
Project Overview

Flight Management System Voice Interface

- Existing System
 - Flight Management System (FMS) Controls Aircraft
 - Aircraft Communication Addressing and Reporting System (ACARS)
 - Text Messages from Air Traffic Control (ATC)
 - Between Aircraft and Ground Station
 - ACARS Interface to FMS
 - Specially Formatted Message
 - Sent to FMS
- New Voice Interface System
 - Capture Pilot's Voice Command
 - Create ACARS Message
 - Send to FMS
- Technologies
 - GE Desktop Trainer
 - Flight Management Workstation

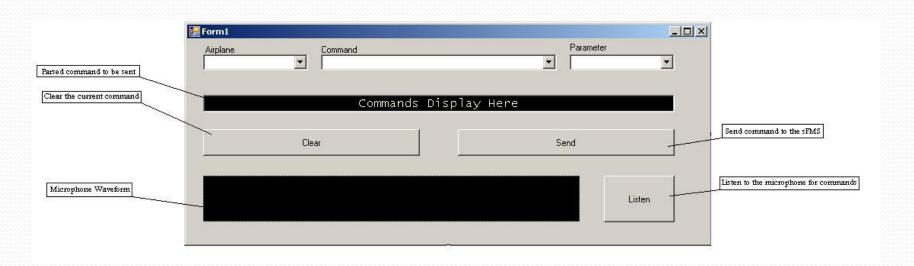
- Air Traffic Control(ATC) Messages
- Aircraft ARINC 429 Interfaces







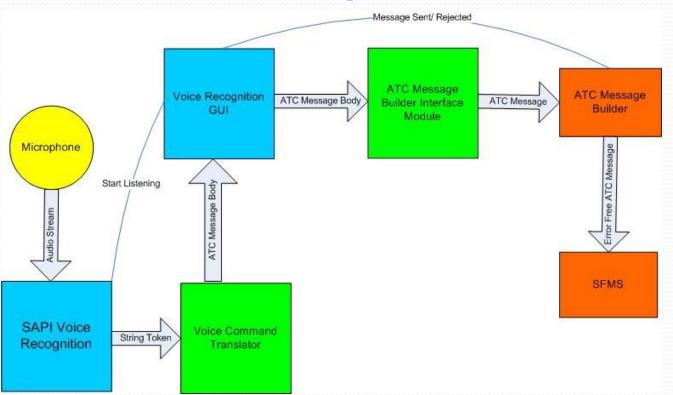
Team 5. GE Aviation Screen Mockup





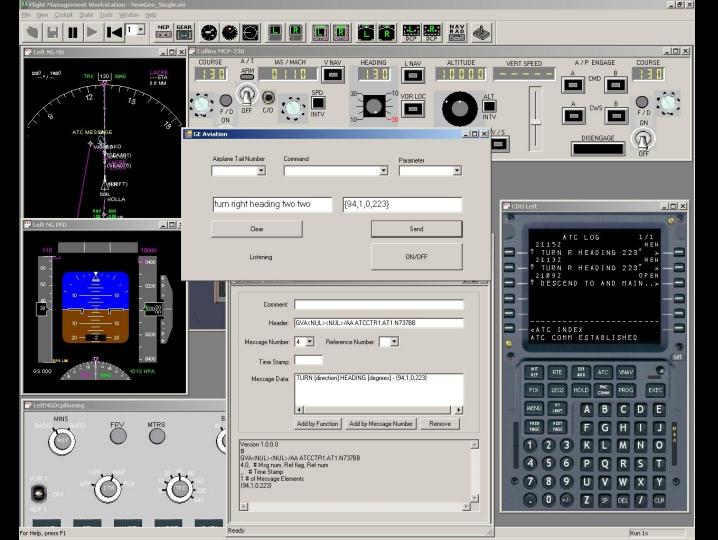
Team 5. GE Aviation

Architecture Diagram

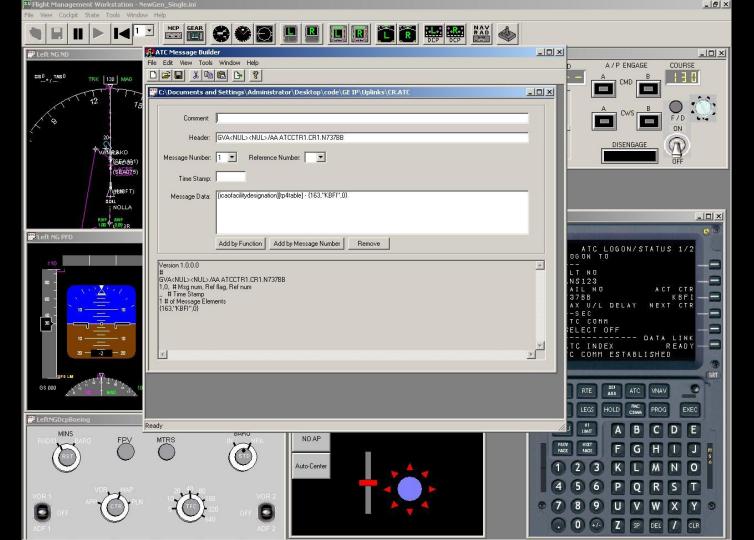




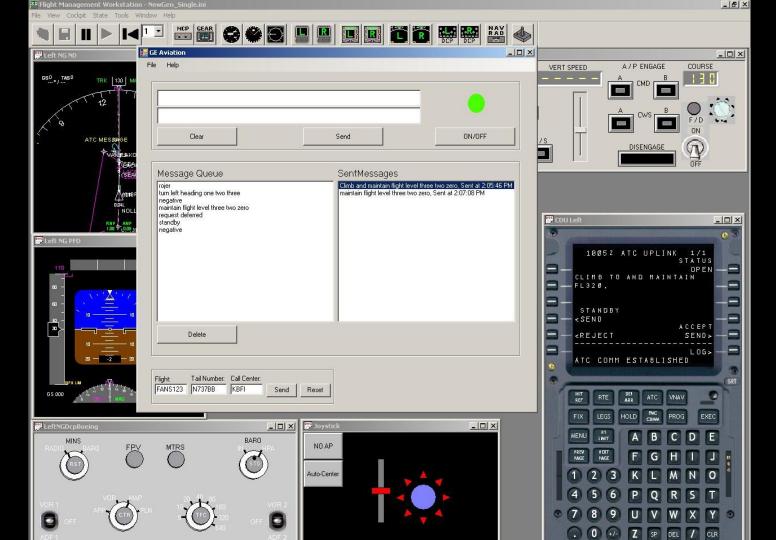


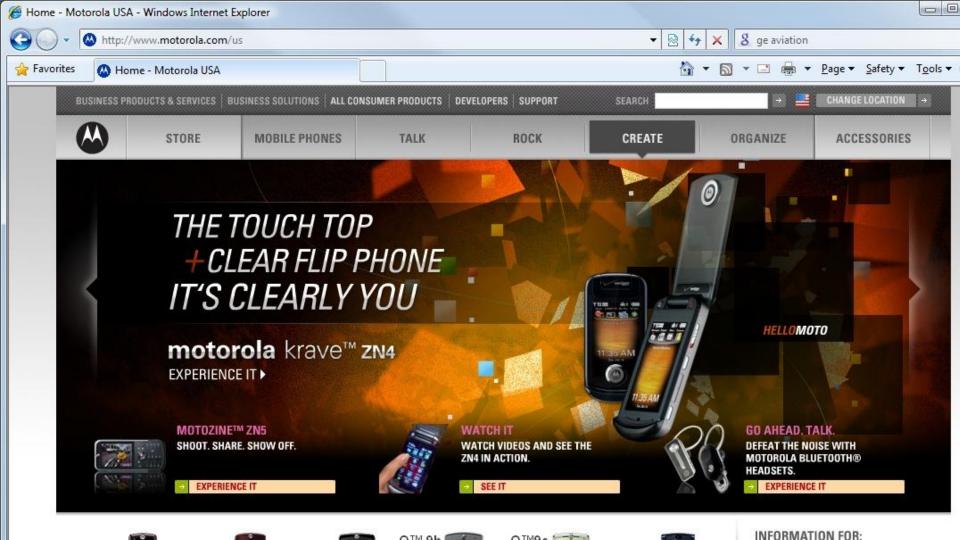












Team 6. Motorola

Project Overview

User Generated Video Service for Cable Systems

- User Scenarios
 - User Uploads Videos from a Computer to Web
 - Associates Metadata with Video
 - Specifies Users Allowed to View Video
 - End Users View Videos on Their Set Top Boxes (STBs)
- Software Components
 - AJAX-Based UI for Uploading
 - JEE/RESTful Web Services Store/Transcode/Deliver Video
 - Menu and User Interface for Set Top Boxes
 - Simulated Cable Headend via VideoLan
- Technologies
 - Advanced Java and JEE
 - Object Oriented Design
 - RESTful Web Services

- AJAX
- Database
- Etc...

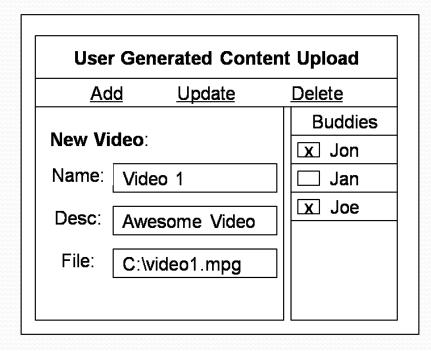






Team 6. Motorola

Screen Mockups

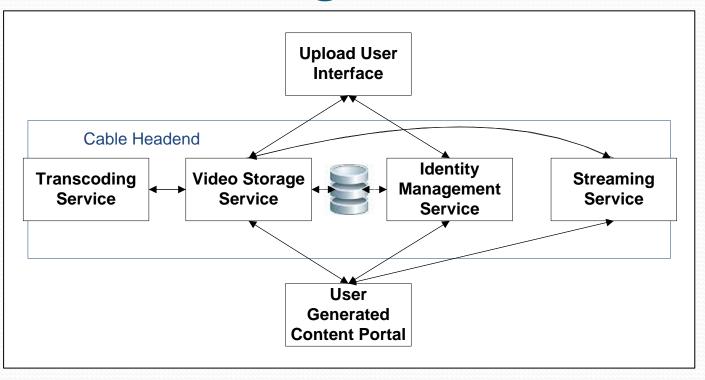


Name: Video 1 Description: Awesome Video Date Added: 02/01/09 Video 1 Video 2 Video 3 Video 4 Video 5



Team 6. Motorola

Architecture Diagram







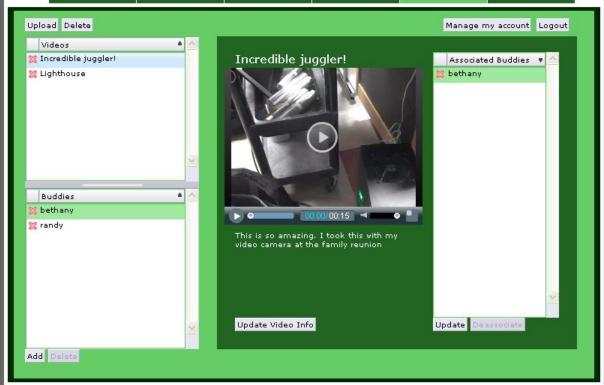




Welcome to Capstone Cable!

Manage your Capstone Cable account. Sign In | Create Account

Learn Shop TV Programming Customers User Generated About Content







- Vis-a-Vis
- ▶ Boat
- Iron Man
- Beta demo



Team 7. TechSmith

Project Overview

Collaborative Video Captioning

- Automatic Video Captioning
 - Upload Video With Audio to Server
 - Perform Software Speech-to-Text Transcription
 - Produce Video with Caption Text Synchronized to Video
- Collaborative Video Captioning
 - Web-Based, Wiki-Style
 - Edit/Correct Captioning Speech-to-Text Mistakes
 - Provide Methods for Consistency and Accepting Corrections
 - Support User Database with Login and Password
- Technologies
 - Windows Vista, Windows Server
 - Speech-to-Text Software
 - Windows Speech Recognition Engine
 - Dragon Naturally Speaking
 - Autonomy/Virage



- Javascript/AJAX
- Microsoft Silverlight

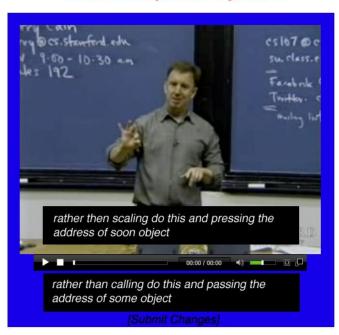




Team 7. TechSmith

Screen Mockups

Video Caption System



Video Caption System

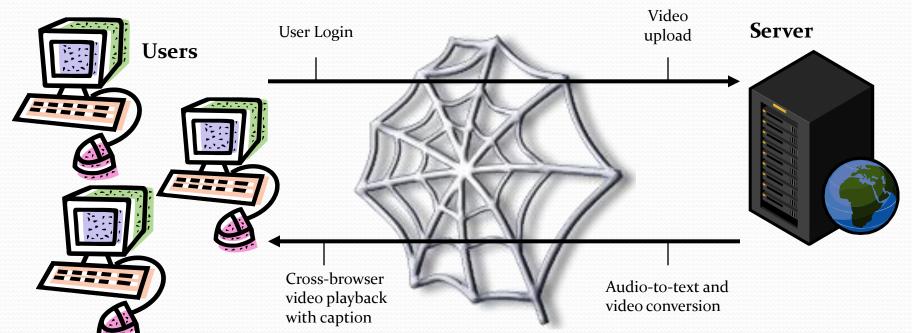




Team 7. TechSmith

Architecture Diagram

Web













Team 8. Terex

Project Overview

Terex Project Portfolio Management

- Project Portfolio Management (PPM)
 - Methods For Analyzing and Managing a Group of Projects
 - Based on a Variety of Key Characteristics
 - Goal to Determine Optimal Mix and Sequencing
- Terex PPM Features
 - Based on Terex Project Management Framework (PMF)
 - Custom Dashboard
 - Custom Reports
 - Uniform Data Entry
 - Role-Based Editing and Approver Permissions
 - List Availability
- Technologies
 - Windows Server 2008
 - SharePoint Services

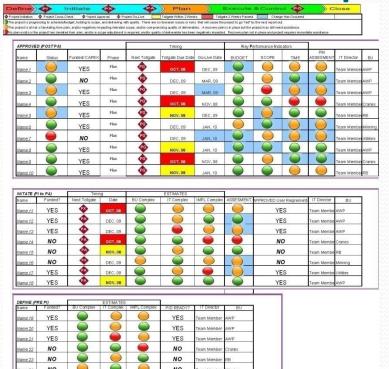






Team 8. Terex

Screen Mockups

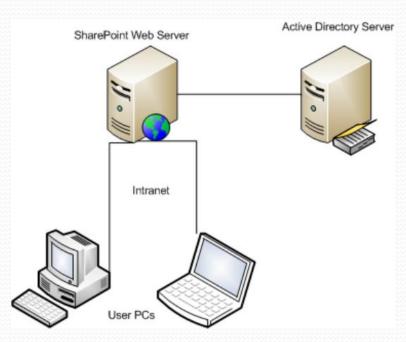


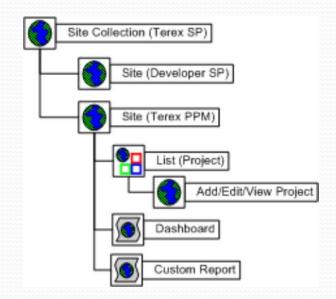
Team Terex			Welcome Brian Beck ▼ My Site My Link		
Marex PPM			All Sites	¥	Advance
Team Terex Terex PPM Docur	nent Center News		JAN SICOS		Site
Team T	erex > Terex PPM	> Project >	Project 2		
	ect: Proje				
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, S Ne	w Itaro Bedit It	em I V De	lata Itam ABN	lanage Permissions Alert M	10
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Title		Projec	t 2		
Status PMF Phase Milestone Due Date		Yellow			
		Execut	e/Control		
		1/16/2	009		
Next	PG				
Busin	Business Driver				
Expec Date	ted Completion	2/12/2	009		
Regio	n	TX			
Site		WEX3			
Busin	ess Segment	Constr	ruction		
Proje	ct Owner	Brad k	asper		
Proje	ct Description	ewqeq			
Cost		<\$10,0	000		
Funde	ed/Capex	Yes			
In Bu	dget	Yes			
Priori	ty	1			
Comn	nents				
Scope	1	dwqdq	W		
Rudge	et Indicator	Red			



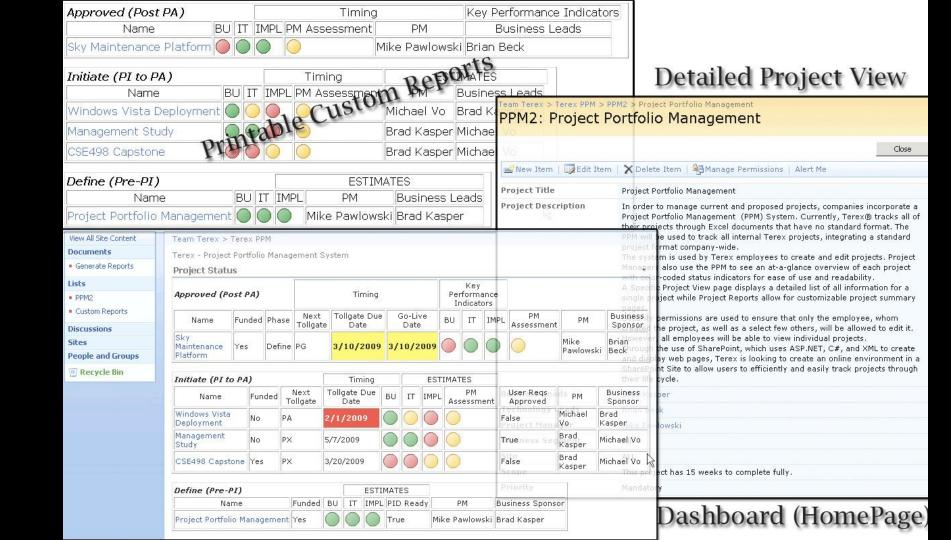
Team 8. Terex

Architecture Diagram





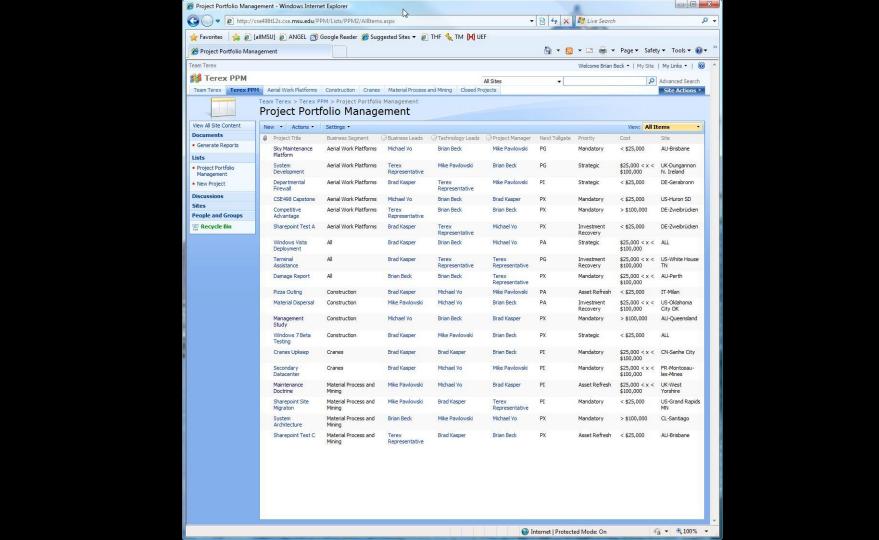




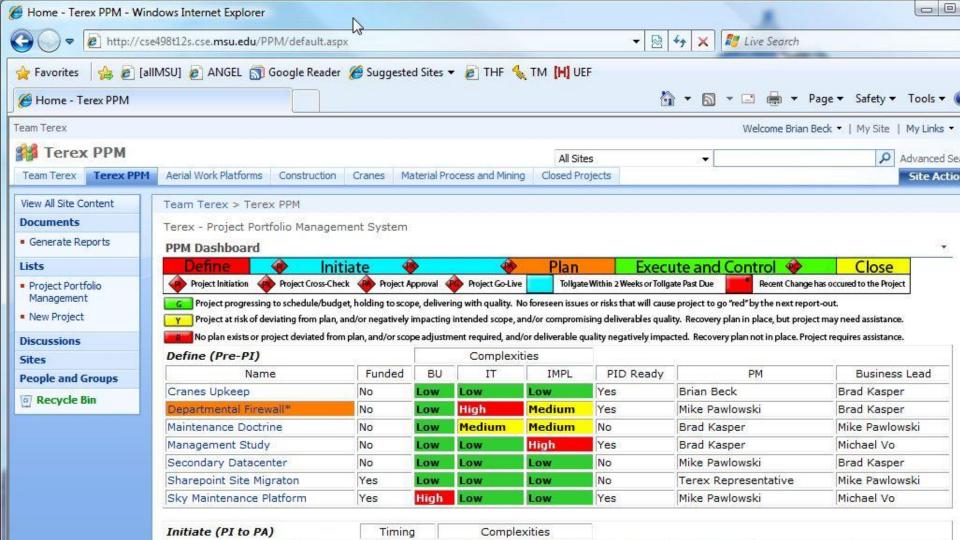


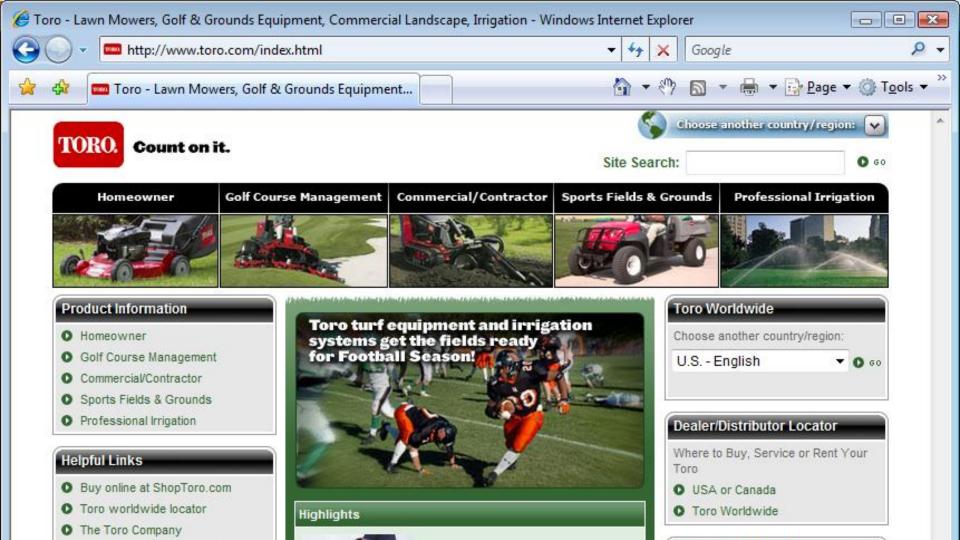












Team 9. Toro

Project Overview

Water Smart Irrigation Software

- GUI for Irrigation and Landscape Lighting Systems
 - Support a Variety of Controllers
 - Provide Wizards
 - Support Advanced Controller Options
 - Upload Program Into Controller
 - Calculate Suggested Watering Times
 - Gather Weather Information
- Technologies
 - Toro Controllers
 - Ecxtra Timer
 - Total Control
 - Rain Dial
 - Windows Vista
 - Visual Studio
 - XML

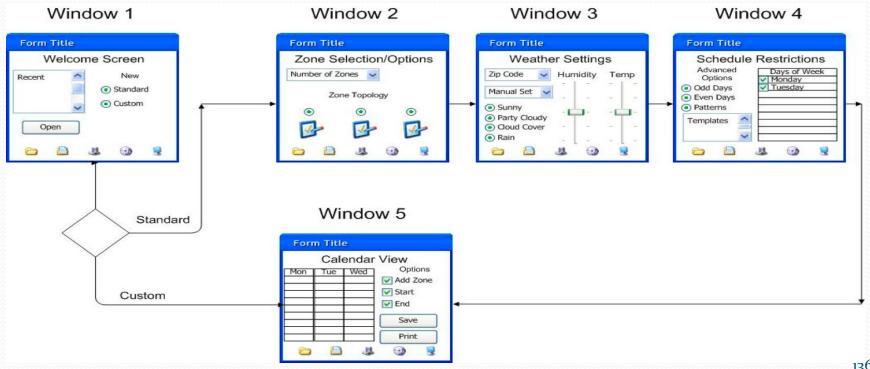


Count on it.





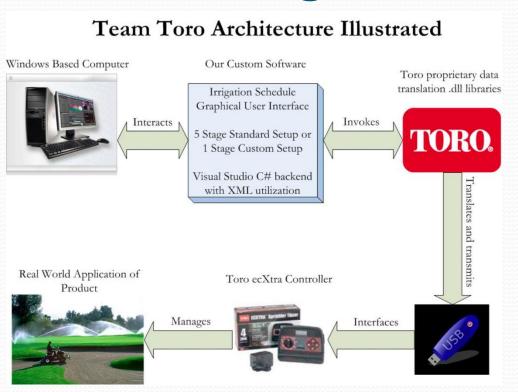
Screen Mockups





Team 9. Toro

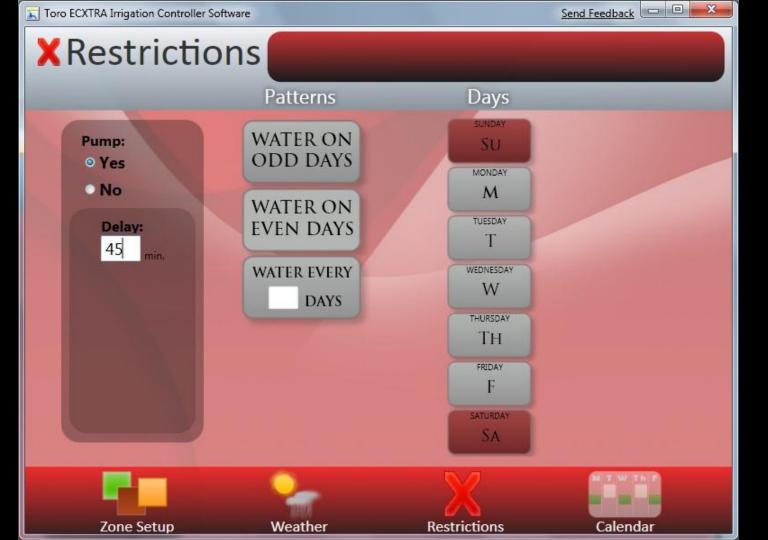
Architecture Diagram













-Calendar

















Weather

Temperature

Humidity HIGH

Wind

Automatic

Custom

Average Temperature: 46 °F

60%-100%

> 10 MPH

HIGH

Zip Code:

48823

DOWNLOAD WEATHER

MEDIUM 30%-59%

LOW

5-10 MPH

MEDIUM

0%-29%

LOW 0-4 MPH

	Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.
Temperature	37	50	59	63	66	58	51
Humidity	54	64	62	61	60	63	60
Wind	15	14	4	2	2	5	7

















Team 10. Urban Science

Project Overview

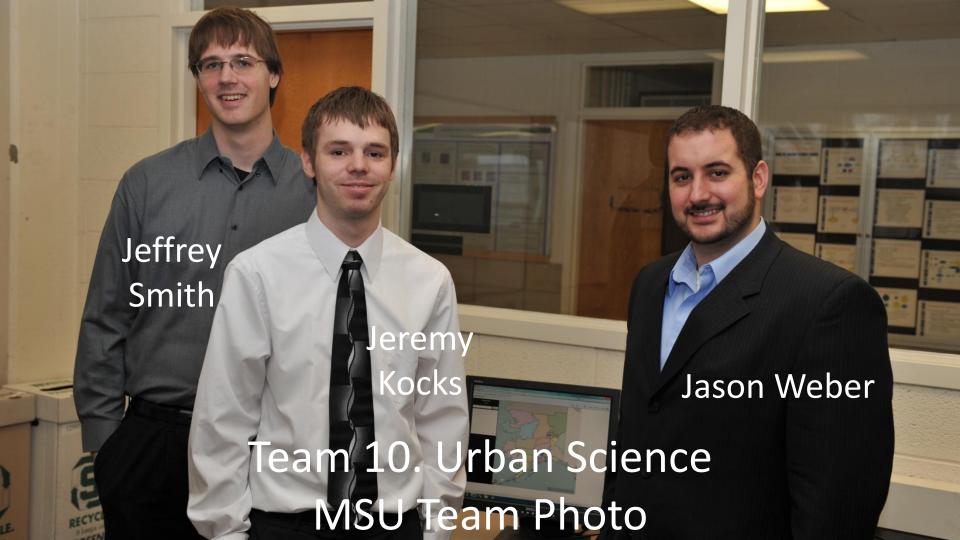
Web-Based Geography Management

- Primary Market Areas (PMAs)
 - Geographic Areas for Performance Measuring or Marketing
 - Aggregation of Smaller Units of Geography
 - Census Tracts
 - Zip Codes
 - Modified Regularly
- Geography Management Tool
 - Web-Based, GUI
 - Detailed Maps (Roads, Water, Cities, PMAs, Etc.)
 - Add, Remove, Edit, Combine, Split, Etc. Geographic Structures
 - Regions
 - PMAs
- Technologies
 - Mapping
 - Microsoft Silverlight



URBAN SCIENCE

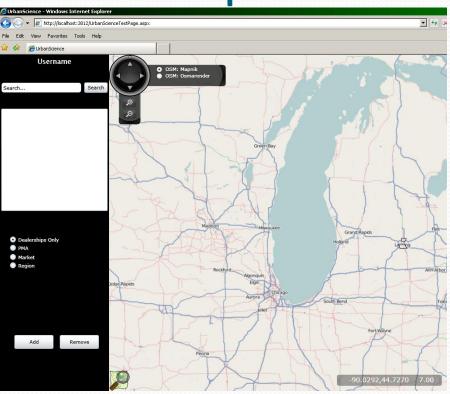
Web Browser Compatibility





Team 10. Urban Science

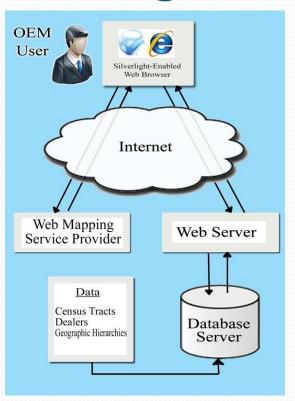
Screen Mockup



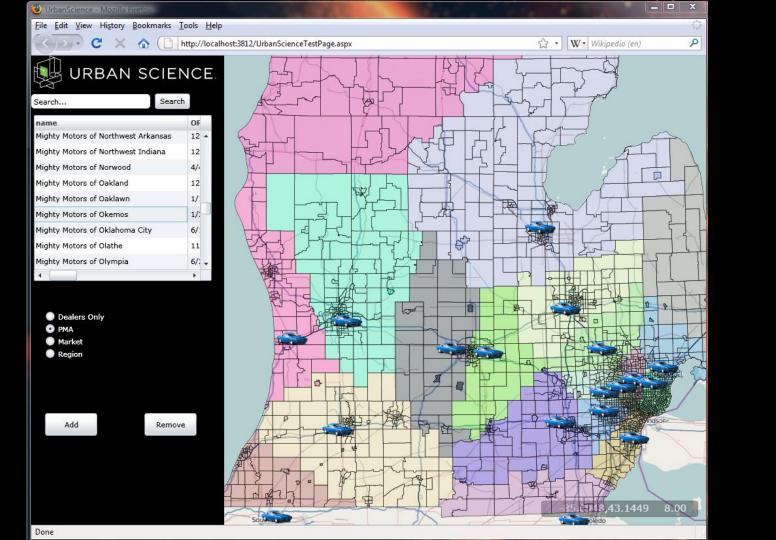


Team 10. Urban Science

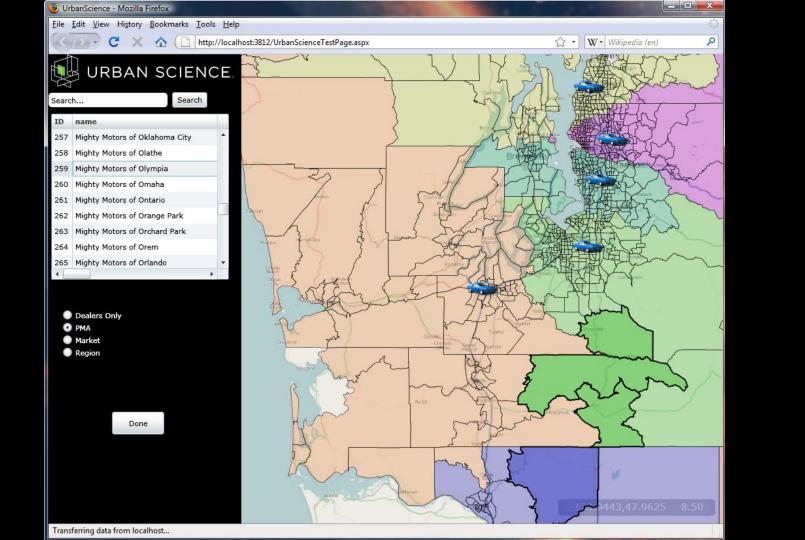
Architecture Diagram

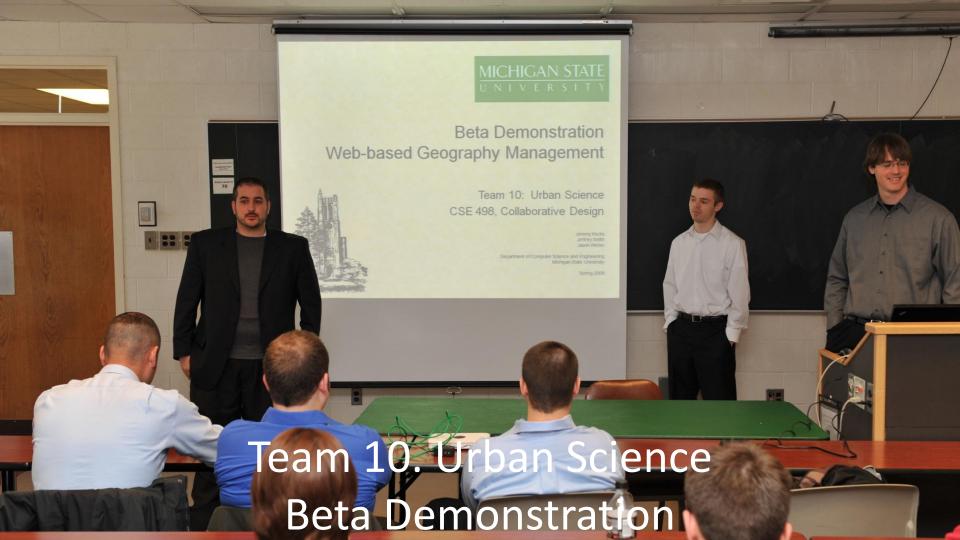


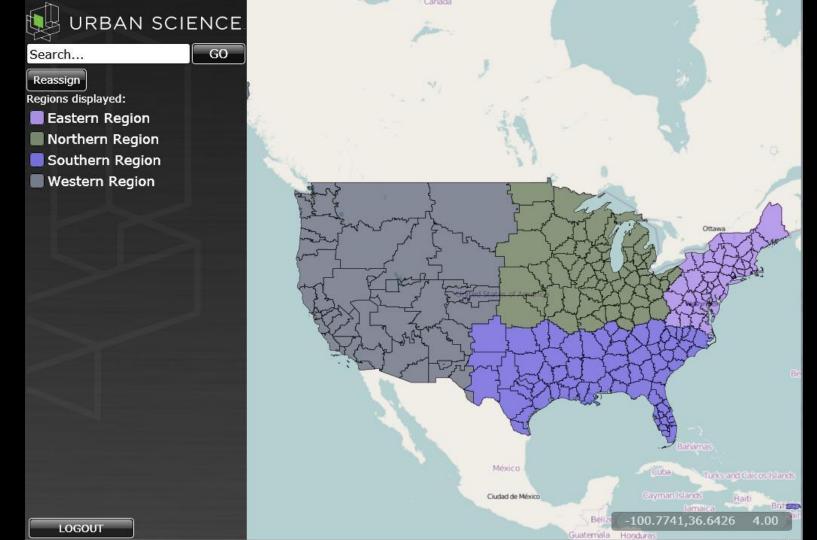




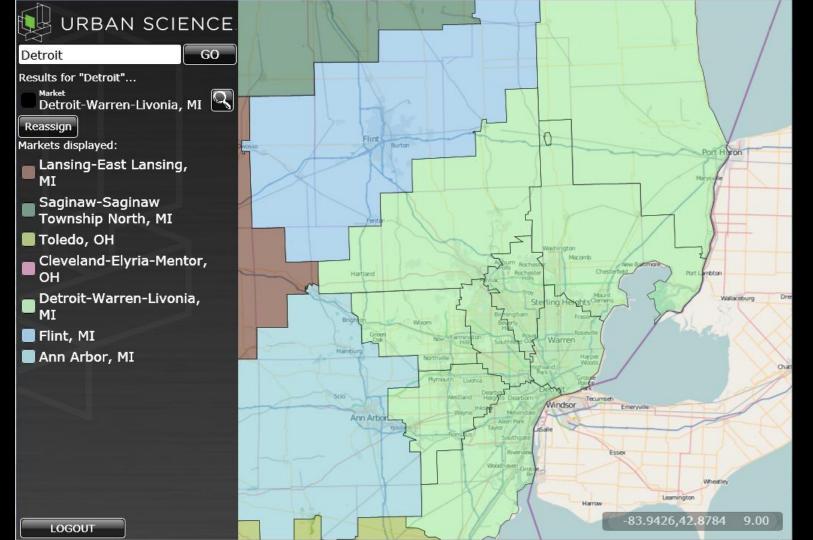










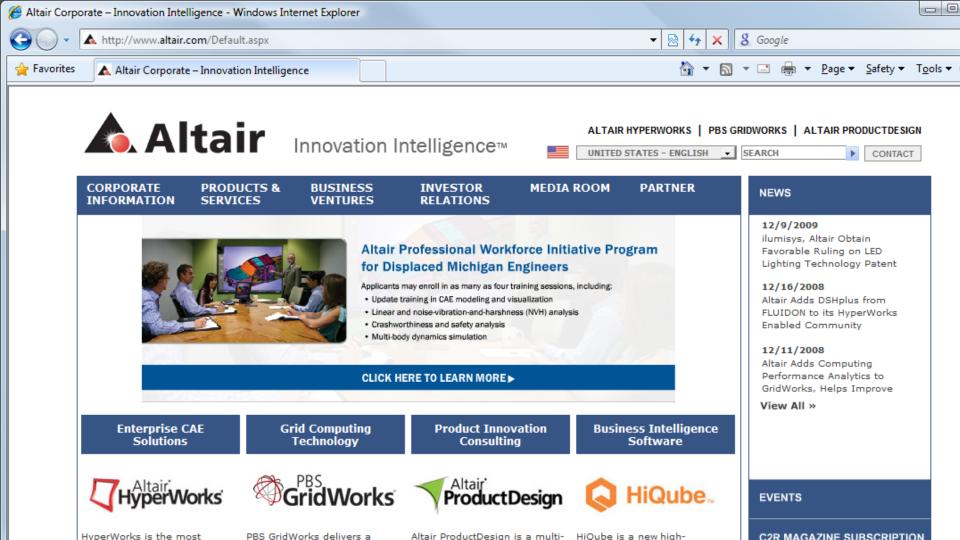


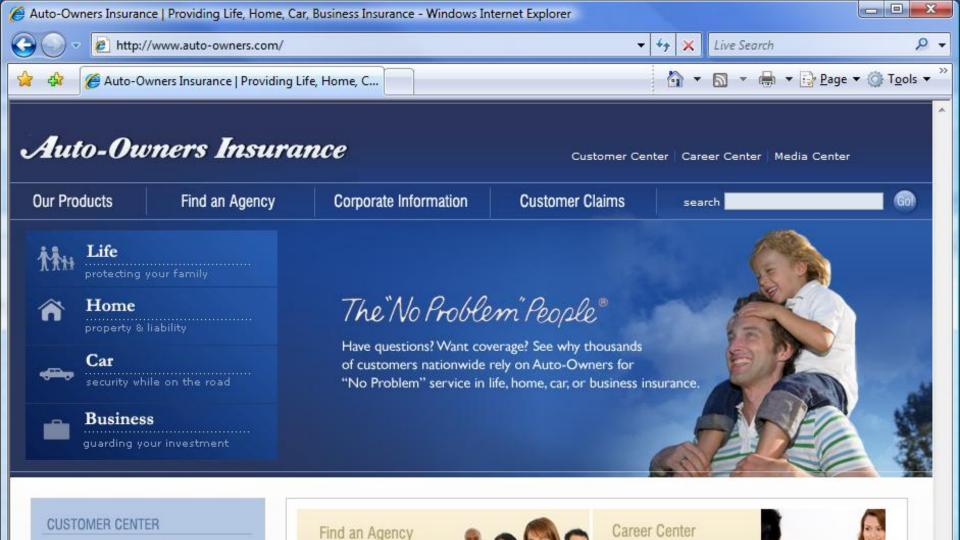
The Computer Science Senior Capstone Experience

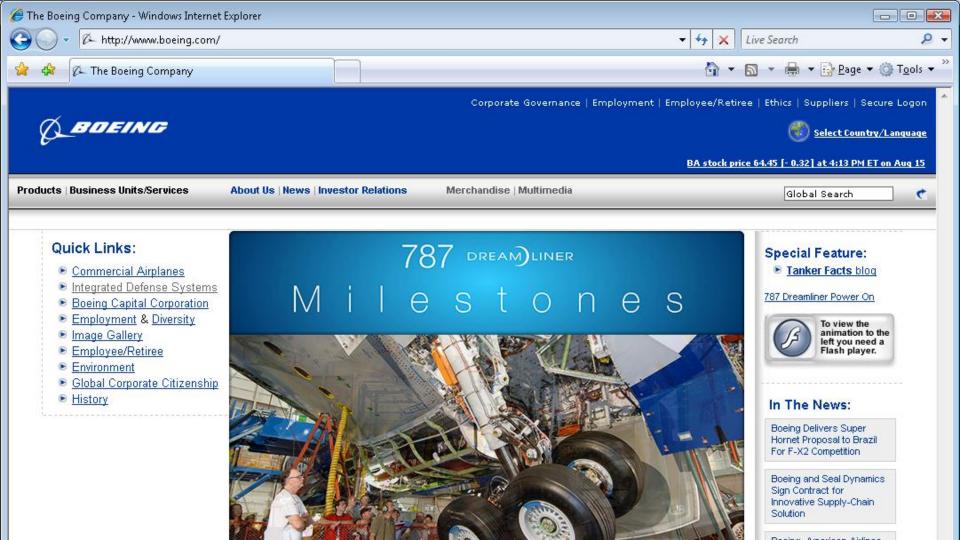
CSE498 Collaborative Design

Department of Computer Science and Engineering
Michigan State University
Spring 2009

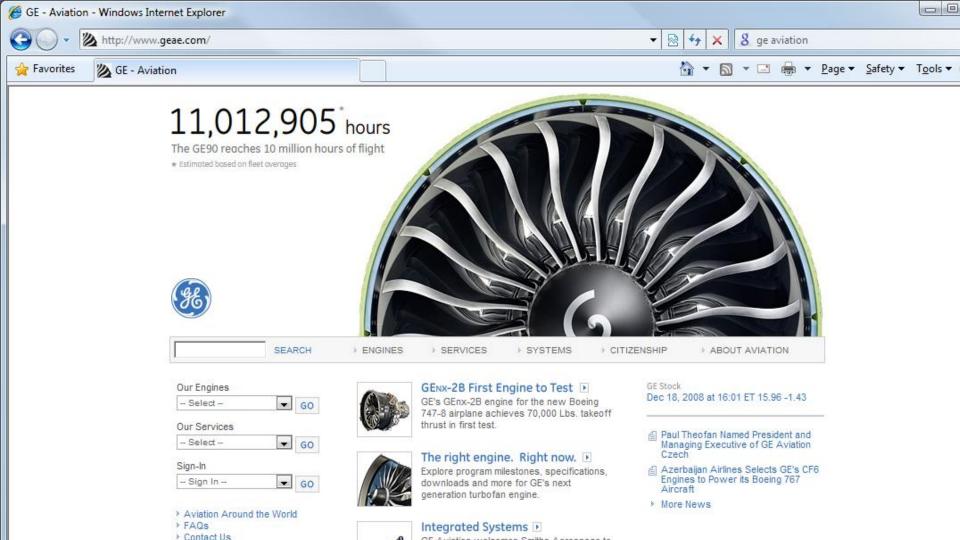
Professor Wayne Dyksen

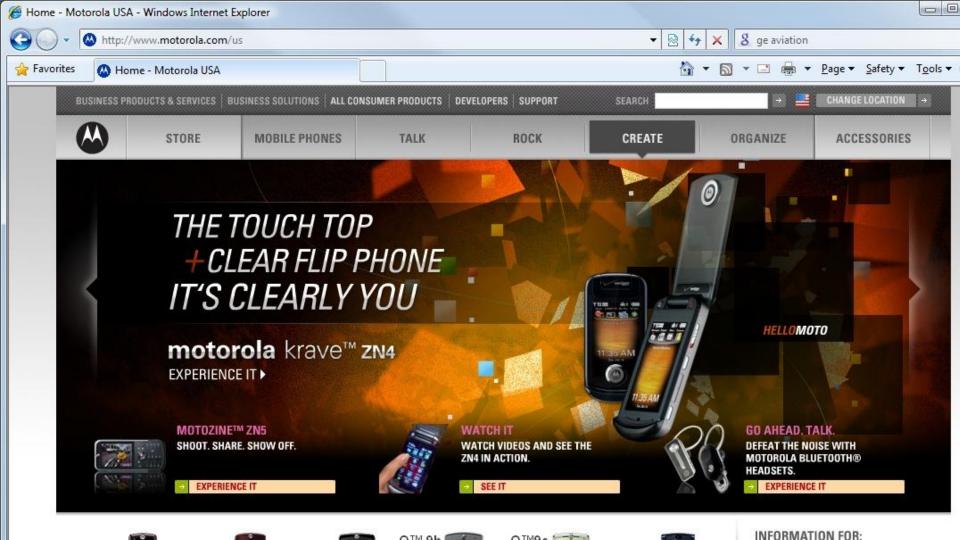






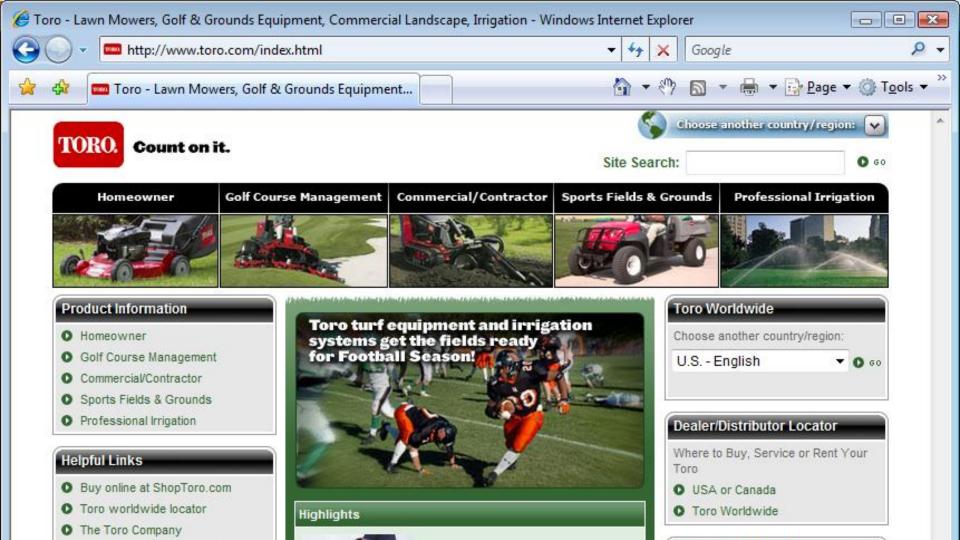












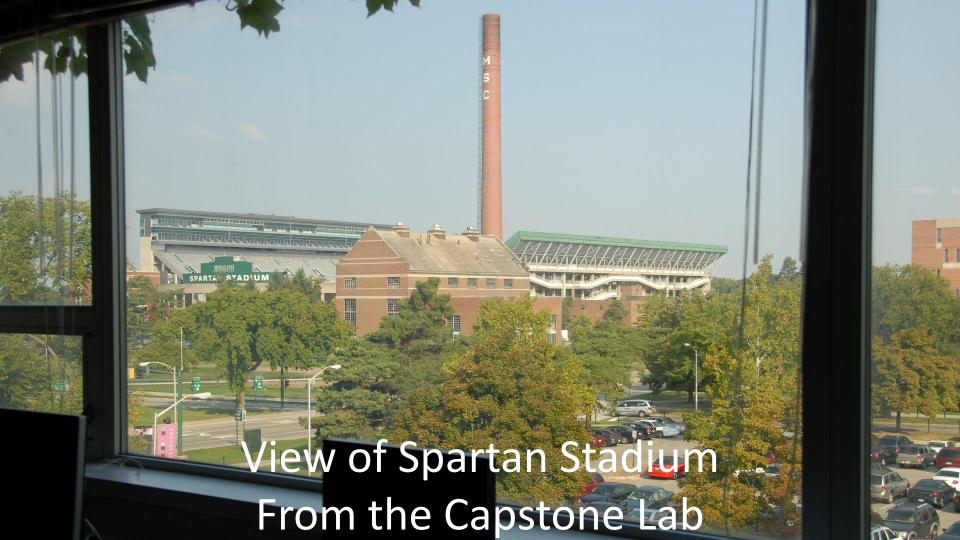


The Computer Science Senior Capstone Experience

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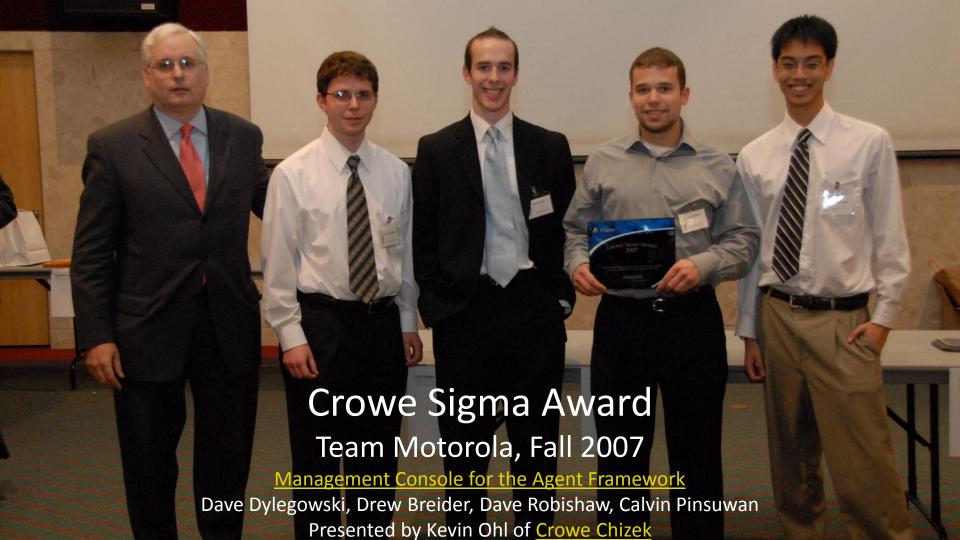
The Computer Science Senior Capstone Experience

Design Day Award Winners

December 5, 2007









The Computer Science Senior Capstone Experience

Design Day Award Winners

April 25, 2008









The Computer Science Senior Capstone Experience

Design Day Award Winners

December 7, 2008







