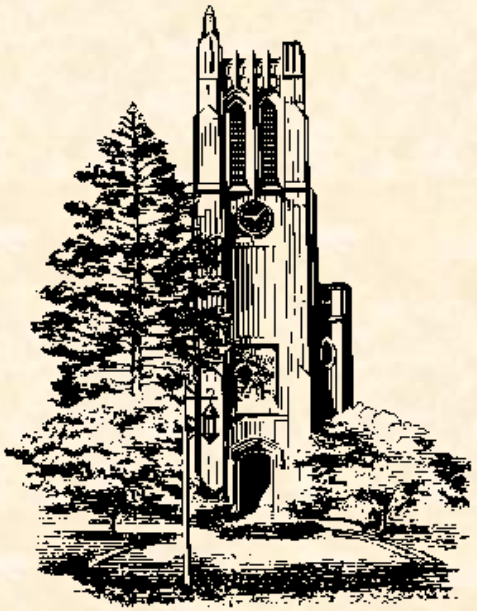
MICHIGAN STATE UNIVERSITY

Project Plan
Web-based Geography Management



Team 10: Urban Science
CSE 498, Collaborative Design

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Team 10 Status Report (1 of 4)

- Client Contact
  - Functional specifications were fully hammered out during our last conference call on Jan 26th.
  - Contact is not interested in the technical details of the project, so we are remaining in contact via email until we have an early build to show him.
- Team Meetings
  - Met the weekend of Jan 31st and Feb 1st to finish project plan and decide on project schedule.
  - Weekly meetings every Tuesday before and after our 3:40 Triage meeting.
- Team Organization
  - Jason Weber – client contact, database admin and developer
  - Jeremy Kocks – webmaster, developer – ASP.NET server backend
  - Jeff Smith – program manager, developer – Silverlight client front end

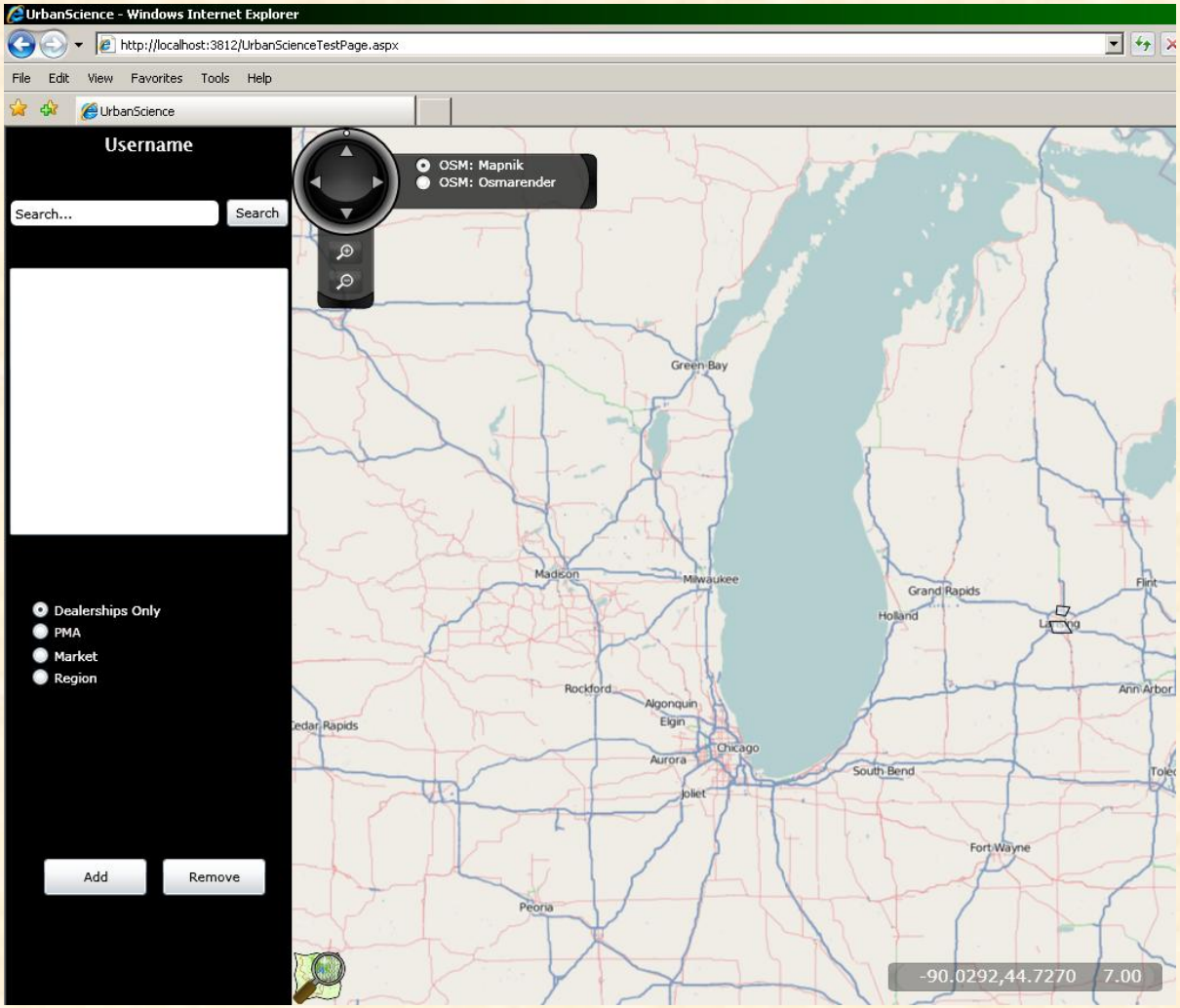
Functional Specifications

- Web-based solution implementing Microsoft Silverlight.
- Easy to use mapping application that allows a user to quickly and easily edit geographic areas assigned to retailers.
  - Editing consists of adding and removing regions from geographic areas.
- Provide a search feature to allow the user to easily locate a retailer, PMA, etc.
- Keep track of all changes made by a user in a database.

Design Specifications

- Client wants to capture the look and feel of the many popular web-based mapping applications. The map should respond to the actions that a user would intuitively perform such as panning with the mouse and zooming with mouse wheel.
- The map will display geographic boundaries that will be clickable in order for the user to easily edit them.
- The user will only be able to see and edit one level of geography at a time.

Screen Mockups



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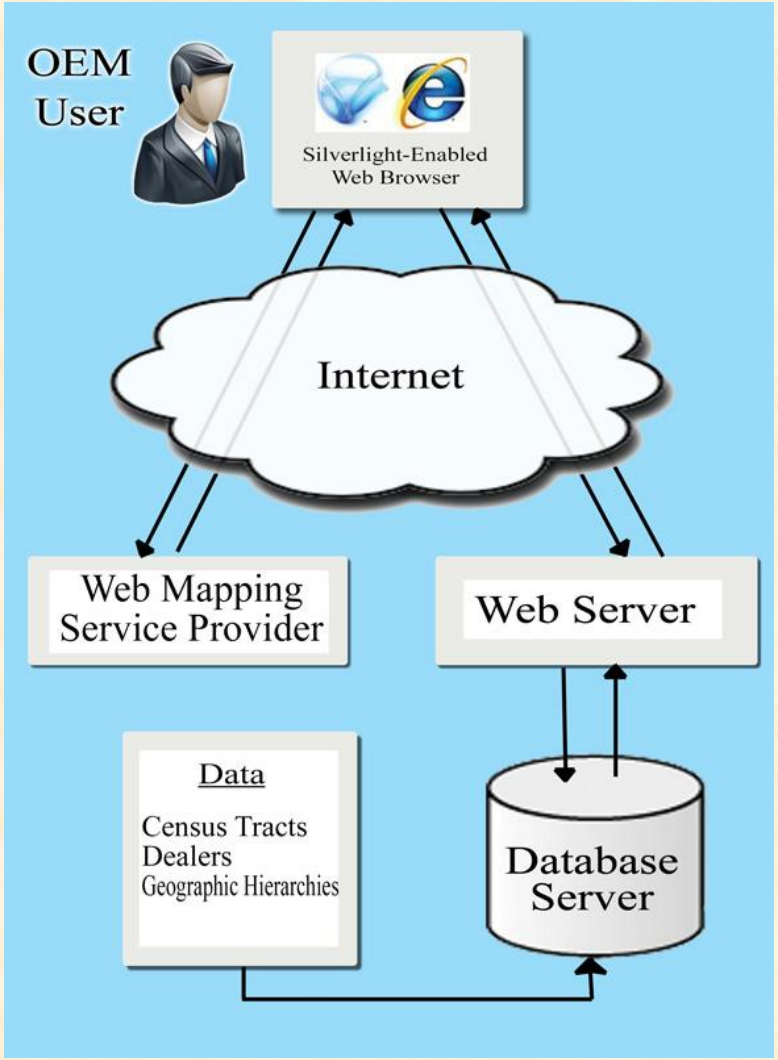
Technical Specifications

- Silverlight is used to offer a rich web-based application that should offer fast performance.
- Making use of the DeepEarth open-source Silverlight control to manage the basic mapping functions.
- MS SQL Server 2008 imports Shapefiles into a binary format that can be read by the program.
- A class hierarchy will maintain the different levels of geography during runtime and a GeographyManager class will be used to maintain the class hierarchy by loading and deleting objects to keep up performance.
- Windows Communication Foundation webservices will be implemented on our server to allow Silverlight the ability to communicate with the database, as Silverlight lacks the ability to do so natively.

Architecture Illustrated



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System Components

- Hardware Platforms
  - Development Server – Dell PowerEdge 850 running Microsoft Server 2003 SP2
  - Development Workstation – Dell Optiplex GX270 running Windows XP Professional SP3.
  - Client end Silverlight app is PC and Mac compatible.
- Software Platforms / Technologies
  - Microsoft Silverlight and ASP.NET using C#
  - SQL Server 2008, supports spatial information
  - DeepEarth open-source Silverlight control
    - Provides an efficient raster mapping engine implementing several map-based web services.
  - Being developed with Visual Studio 2008 and deployed on IIS 6.0.

Risks

- Vector-based map data can take a long time to load when dealing with large numbers of polygons, but the application needs to be fast and responsive.
- The huge amount of coordinates that we'll be dealing with may overwhelm Silverlight. We've been warned that Silverlight performance drops off when there are over 5,000 objects on the screen.
- We may need to develop an algorithm for removing points from a polygon that aren't necessary. Performance will be more important than 100% geographical accuracy.
- Silverlight uses XAML markup to provide the interface, while a WYSIWYG editor exists, a deep understanding of this XML based language will still be necessary.
- None of us have worked with WCF webservices, which is a major component for allowing Silverlight to communicate with the SQL Server database.