NEWS ON WORLD MAP

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Master of Science
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Computer Science

by
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News On World Map

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Dec 18, 2013
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DEDICATION

This thesis is dedicated to my family and Dr. Carl Eckberg. I could not have accomplished this without their support.
ABSTRACT OF THE THESIS

News On World Map
by
Vipul P. Satav
Master of Science in Computer Science
San Diego State University, 2014

The internet has become a primary news source today. Much news is gotten through web services, RSS feeds, online channels and Social networking. Such large numbers of resources led to exploring available opportunities in online news and application development. On the other hand paper maps and printed guides are now leftovers of two decades past. They have been replaced by geo services like satellite imagery, GPS trackers, location data and maps, which represent the most advanced digital mapping technologies. Geo services are making our lifestyle even better as it has become something important part of our day to day life. Online service like Bing Maps, Google Maps, and Nokia Maps etc. allows searching and locating your finding within fraction of a second.

This thesis focuses on creating a tool for displaying news on a world map. The basic motivation behind the thesis is to combine the power of map services and news services to provide simple platform for news browsing. The users have the ability to get the latest news on a single click and see where it happened on world map! The tool also provides features such as display top news, search news by particular region; and so forth.

Web technologies like Bing maps, Silverlight 5, web services were used along with the Visual Studio 2010 as a primary development environment. The tool can run via a website and user just needs to have Silverlight installed on his system.
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I would like to thank Prof. Carl Eckberg for giving me an opportunity to work on this project and for constant motivation and guidance throughout the development of this project. I would like to thank Prof. William Root and Prof. Mark Dunster for being on my thesis committee and for their support.
CHAPTER 1

INTRODUCTION

The internet has become a primary news source today. Much news is gotten through web services, RSS feeds, online channels and Social networking. Such large numbers of resources led to exploring available opportunities in online news and application development. On the other hand paper maps and printed guides are now leftovers of two decades past. They have been replaced by geo services like satellite imagery, GPS trackers, location data and maps, which represent the most advanced digital mapping technologies. Geo services are making our lifestyle even better as it has become something important part of our day to day life. Online service like Bing Maps, Google Maps, and Nokia Maps etc. allows searching and locating your finding within fraction of a second.

This thesis focuses on creating a tool for displaying news on a world map. The basic motivation behind the thesis is to combine the power of map services and news services to provide simple platform for news browsing. This chapter begins with introducing existing news sources and outline of this thesis project.

Today can easily get news through Bing news, Google news etc. The following Figure 1.1 and 1.2 shows the current classifications of the news.

It shows various categorization of the news such as Top Stories, U.S., World, Local, Trending Topics, Politics, etc.

It shows similar news categories. It is also tracking the location of the user. On the right hand side you can see the San Diego weather.

Also, there are different financial news sources, gaming news sources, technology news sources making more data available to the user. Figure 1.3 explaining various news resources are available for end users. But on the other side it becomes difficult for the user to track and follow it. The scope of this thesis is on the local news and the current user selected location. Local news is derived from the sources like Bing news and Google news.
This thesis project is designed in way that the user can get local news from any location on the earth map in a single click and quickly. News is displayed on the world map beside the click. Bing map is used as the underlying map technology. The project has been developed using C#, Silverlight and various news services.

This thesis document has the following chapters:

- Chapter 1 discusses motivation and introduction to thesis work
- Chapter 2 covers overall functional requirements of the thesis project and research done
Figure 1.3. Various news resources are out there for users.

- Chapter 3 discusses in detail about the technologies used in the project and how they work and how to use them.
- Chapter 4 details the implementation of the News on World Map.
- Chapter 5 gives conclusion and obstacles faced during development of this thesis.
- Chapter 6 discusses future work.
CHAPTER 2

NEWS ON WORLD MAP

2.1 MOTIVATION

The idea behind the project arouse when I read the news about the Myanmar Earthquake that happened in 2012. On Nov 11 2012, a strong earthquake collapsed a bridge and damaged Buddhist pagodas in northern Myanmar. The earthquake had 6.8 Magnitude and killed at least 12 people. When I read this news I was thinking of where is this location and why are earthquakes of such high magnitude happen there? Then I started researching about Myanmar a bit more. I was so curious to know the location of that incident. I did a search on internet and found the location on the map.

This incident gave me the idea of displaying news on a world map rather than just links. It would be easy to understand the area immediately, look for news around that area and stay informed!

2.2 PROBLEM STATEMENT

The main objective of this thesis project is to develop an application which will show news on a world map. The Application should be easy to access, easy to explore the map, accurately track the location and reliably show the news in a selected location on the map. Also, it should make it easy for the user to see details of the news if he is interested.

2.3 SCOPE OF THE THESIS

The thesis project involves developing a web based application. Web based application is developed using one of the Microsoft technology: Silverlight. Silverlight exposes map APIs and rapid application development environment with more secure environment. The decision was made to integrate Bing maps with Bing news and Google news. The thesis also explains more about Bing maps APIs, Bing news APIs and Google news sources used. Bing geocoding and reverse geocoding services are integrated in order to resolve locations mappings.
2.4 SIGNIFICANCE OF THE THESIS

The main aim of this project is to give the user single click news information. The application should be fast, accurate and reliable. Also it should provide an easy way to explore maps and make it easy to see details about the news. The challenge of this thesis address is to integrate various news sources, and show news summary for a selected location. Also, the thesis provides an extensible framework for further easy integration of new news source without affecting the end user experience. The implementation of thesis is in C#, Silverlight web client, Geocoding and reverse geocoding services and usage of news services like Google news and Bing news.

As shown in Figure 2.1, the web application is interacting with a server only. This server is always connected to the internet in order to use news service and geocoding services. User calls are not specific to any specific platform. The web application never knows which news service we are using or which geocoding is responsible for finding latitude and longitude of corresponding data or which reverse geocoding service is used to get an address from latitude, longitude. So, it is easy for changing the news service to a new one without affecting clients attached to the server and without changing their interfaces.

Figure 2.1. News on world map.
2.5 KEY FEATURES OF THE PROPOSED SYSTEM

Following are the key features of the system:

1. Application is developed by using Microsoft technology like Silverlight, C#, Bing maps, Bing news.
2. Google news source integration along with Bing news for better accuracy and making use of available news data instead of creating new one.
3. Use of Design Patterns at client side and server side for better performance and extensibility of the project.
4. Silverlight based map integration and C# as primary language for coding.

2.6 RESEARCH STEPS

This section describes the steps undertaken in the preparation phase of this thesis project, as well as identifying and understanding the technologies required for solving the current problem. Since this thesis has a significant GIS background, news technology, map technology and Silverlight, it was important to get familiar with these concepts.

1. Identifying news service

The basic task is to get news sources that can be easily accessible via C# programming language and can be easily integrated into map. Also, there are paid news services available (Yahoo finance, Google search, etc) with a limited number of allowed queries was making difficult to select particular sources. News services to be used were identified and studied.

2. Bing Map technology and APIs exploration

Since thesis project requires the map to show news over it. As Bing map is easily available and evolving; they have provided very interactive learning experience and sample applications. In order to understand Bing map APIs, sample applications were developed and various APIs studied.

3. Design of web based application

It was decided to make the client side user interface a web portal. This decision was made for easy end user interaction and availability of an application across all devices and operation system platforms. I found Silverlight is a very secure way to use Bing maps, having sufficient documentation and available active online forum help. It is easy to develop a web application in Silverlight. I have studied how to develop Silverlight based web based application and using C# as backend development language.

4. Integrating map and news service

Even Bing map is accessible via Silverlight though integrating it with various news services was challenging. In order to accomplish this task I have studied news services APIs to see which ones can be used in Silverlight.
5. Review design patterns for an application development

In order to make an application more reusable and easily extensible, proper use of design patterns was expected. I have studied and identified design patterns for an application development.
CHAPTER 3

TECHNOLOGY

3.1 SILVERLIGHT

This topic describes the essential architecture and components of Microsoft Silverlight. Silverlight is a canvas for displaying interactive Web and media content to end users. It is also a platform for developing portable, cross-platform, networked applications that integrate data and services from many sources. Furthermore, Silverlight enables one to build user interfaces that will significantly enhance the user experience [1]. Table 3.1 describes the Silverlight components. I have used presentation framework and .net framework for Silverlight in order to build this project.

Table 3.1. Silverlight Components and Description

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core presentation framework</td>
<td>Components and services oriented toward the UI and user interaction, including user input, lightweight UI controls for use in Web applications. It also uses the Extensible Application Markup Language (XAML) for specifying layout.</td>
</tr>
<tr>
<td>.NET Framework for Silverlight</td>
<td>A subset of the .NET Framework that contains components and libraries, including data integration, extensible Windows controls, networking, base class libraries, garbage collection, and the common language runtime (CLR).</td>
</tr>
<tr>
<td>Installer and updater</td>
<td>This provides easy process for the application to install and update.</td>
</tr>
</tbody>
</table>

Developing an application in Silverlight technology was quite easy due to available tools. Main reason behind using this technology is to make an application independent of the platform, independent of the file formats, protocols and web browsers. I wanted to use
technology which leverages rendering of the map and give equal performance across all available top browsers like IE, Chrome, Firefox etc.

I have used XAML as a markup language to define UI elements, data binding, eventing, and other features. It is the primary point of interaction between the .NET Framework and the presentation layer. XAML is used extensively in .NET Frameworks and Silverlight. XAML elements map directly to Common Language Runtime object instances, while XAML attributes map to Common Language Runtime properties and events on those objects [2]. XAML files can be created and edited with standard text editors. Anything that is implemented in XAML can be expressed using a more traditional .NET language, such as C# or Visual Basic.NET [2]. It reduces complexity needed to process XAML, because it is based on XML. Here, I have used C# as the underlying language to handle XAML events. Table 3.2 is describing few features of C# those I have used in the project.

**Table 3.2. Describing Features of C#**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td>Handles inputs from hardware devices such as the keyboard and mouse, drawing, or other input devices.</td>
</tr>
<tr>
<td>UI Rendering</td>
<td>Renders vector and bitmap graphics, animations, and text.</td>
</tr>
<tr>
<td>Media</td>
<td>Features playback and management of various types of audio and video files, such as .WMP and .MP3 files.</td>
</tr>
<tr>
<td>Deep Zoom</td>
<td>Enables you to zoom in on and pan around high resolution images.</td>
</tr>
<tr>
<td>Controls</td>
<td>Supports extensible controls that are customizable through styling and templating.</td>
</tr>
<tr>
<td>Layout</td>
<td>Enables dynamic positioning of UI elements.</td>
</tr>
<tr>
<td>Data Binding</td>
<td>Enables linking of data objects and UI elements.</td>
</tr>
<tr>
<td>DRM</td>
<td>Enables digital rights management of media assets.</td>
</tr>
<tr>
<td>XAML</td>
<td>Provides a parser for XAML markup.</td>
</tr>
</tbody>
</table>

**3.2 .NET Framework**

.Net framework is an integral windows component that supports building and running the next generation applications and XML web services. The .NET Framework is designed to
provide a consistent object-oriented programming environment whether object code is stored
and executed locally [3].

The .NET Framework for Silverlight is a subset of the full .NET Framework. It
provides the essentials of robust, object-oriented application development for application
types (such as Internet applications) for which this support has not traditionally been
available. Table 3.3 describes commonly used features of the .net framework.

### 3.3 Map

Bing Maps is a web mapping service provided as a part of Microsoft's Bing suite of
search engines. Bing maps also provide set of features like the street maps, road view, arial
view, bird's eye view, street side, 3D maps, driving, walking and transit directions, traffic
information, etc. Bing map comes with AJAX and Silverlight version. The Silverlight
version is positioned to offer dynamic features and a smoother experience. The Bing Maps
APIs include map controls and services that you can use to incorporate Bing Maps in
applications and websites. In addition to interactive and static maps, the APIs provide access
to other geospatial features such as geocoding, route and traffic data and spatial data sources
that you can use to store and query data that has a spatial component, such as store locations.

This project using windows RT OS platform for Bing maps along with Silverlight.
Forward and reverse geocoding are the main features used. Forward Geocoding - Get latitude
and longitude coordinates for a location by specifying values such as locality, postal code,
street address, or an address query string. Reverse Geocoding - Get location information,
such as address data, associated with latitude and longitude coordinates. Specific APIs are
discussed in the chapter 4.

### 3.4 RSS

RSS is a Web content syndication format. Its name is an acronym for Really Simple
Syndication. It is used to keep the users updated of their favorite websites, so practically it is
replacing bookmarking around the web. RSS is a dialect of XML. All RSS files must
conform to the XML 1.0 specification, as published on the World Wide Web Consortium
(W3C) website [4].

It is an XML format that is intended for use by computers on behalf of people, rather
than being directly presented to the HTML. At the top level, a RSS document is a <rss>
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data</td>
<td>Supports Language-Integrated Query (LINQ) and LINQ to XML features, which ease the process of integrating and working with data from disparate sources. It supports the use of XML and serialization classes for handling data.</td>
</tr>
<tr>
<td>Base Class Library</td>
<td>A set of .NET Framework libraries that provide essential programming functions, such as string handling, regular expressions, input and output, reflection, collections, and globalization.</td>
</tr>
<tr>
<td>Window Communication Foundation</td>
<td>Provides features to simplify access to remote services and data. This includes a browser object, HTTP request and response object, support for cross-domain HTTP requests, support for RSS/Atom syndication feeds, and support for JSON, POX, and SOAP services.</td>
</tr>
<tr>
<td>CLR</td>
<td>Provides memory management, garbage collection, type safety checking, and exception handling.</td>
</tr>
<tr>
<td>WPF</td>
<td>Provides set of controls, including Button, CheckBox, HyperlinkButton, ListBox, RadioButton, and ScrollViewer.</td>
</tr>
<tr>
<td>DLR</td>
<td>Supports the dynamic compilation and execution of scripting languages such as JavaScript and IronPython to program Silverlight-based applications. Includes a pluggable model for adding support for other languages for use with Silverlight.</td>
</tr>
</tbody>
</table>
element, with a mandatory attribute called version, that specifies the version of RSS that the
document conforms to. If it conforms to this specification, the version attribute must be 2.0.
Subordinate to the <rss> element is a single <channel> element, which contains information
about the channel (metadata) and its contents. Figure 3.1 shows basic framework of the rss.
<?xml version="1.0" encoding="ISO-8859-1" ?>
<rss version="2.0">
  <channel>
    <title>News on World Map</title>
    <link>http://www.domain_is_under_dev.com</link>
    <description>Just click and brose your news</description>
    <item>
      <title>First News</title>
      <link>http://www.domain_is_under_dev.com/nowm</link>
      <description>Lets start with your current location to browse news around</description>
    </item>
  </channel>
</rss>

The most basic metadata supported by RS includes a title for the link and a
description of it.

Figure 3.1 explains how RSS feed works. Web publisher generally publish articles
and news. These articles and news are generated in RSS feed. An aggregator is the most
common use of the RSS feeds. One of these aggregators is web aggregator, which is also a
portal. Web aggregator collects RSS feeds from different servers and displays them in a web
page in user friendly manner. Aggregator can offer a variety of special features including
combining several related feeds into a single view; hiding items that viewer has already seen
and categorizing feeds.

RSS allows client to see your site without going out of their way to visit it and it
actually improves your site’s visibility. RSS can keep your clients up to date with your site’s
feed. I have used RSS programmatically and can be parsed easily by using C# XML parsers
available in order to make use of them in this project.
3.5 News Services

Bing News (previously Live Search News) is a part of Microsoft's Bing search engine [5]. It is a search engine and aggregator specifically for news articles through a variety of trusted and credible internet news sources, including New York Times, Washington Post and Reuters. News headlines from various sources are aggregated and categorized into sections for users to browse, which include top stories and category-specific articles such as business, politics or entertainment. Bing News also allows users to type in a search term to browse through an archive of news articles that are relevant to the search query. In addition, the right panel of the search results page also allows users to refine their results by location and category, or search with an alternative related search term.
3.6 Web Service

Web services are message framework those are capable of sending and receiving messages using standard internet protocol. Basically web service has two components; server listener and service proxy.

The service listener waits for requests from the clients using protocol such as HTTP, SOAP, etc. The proxy relays the requests to an application program and sends its result to the service listener. The application server contains applications to implement business logic to process actual tasks. Overall working process is explained in Figure 3.2.

![Diagram of Web Service Components](image)

**Figure 3.2. Shows basic working model of the web service.**

I have used Windows Communication Foundation (WCF) framework for building service-oriented applications. Reason behind is that my application can send data as asynchronous messages from one service endpoint to another. A service endpoint can be part of a continuously available service hosted by IIS, or it can be a service hosted in an application [6]. An endpoint can be a client of a service that requests data from a service endpoint. The messages can be as simple as a single character or word sent as XML, or as complex as a stream of binary data. A few sample scenarios include:

- A Silverlight application to poll a service for the latest data feeds.
- A dashboard application that polls one or more services for data and presents it in a logical presentation.
- A chat service that allows two people to communicate or exchange data in real time.
- A service that supplies current data to others, such as a traffic report or other monitoring service.
Features of WCF include service orientation, Interoperability, Multiple message patterns, service metadata, Data contracts, security, Durable messages, etc.

Figure 3.3 illustrates the major layers of the Windows Communication Foundation (WCF) architecture.

Figure 3.3. WCF basic architecture.

3.6.1 Contracts and Descriptions

Contracts define various aspects of the message system. The data contract describes every parameter that makes up every message that a service can create or consume.

3.6.2 Service Runtime

The service runtime layer contains the behaviors that occur only during the actual operation of the service, that is, the runtime behaviors of the service. Throttling controls how many messages are processed, which can be varied if the demand for the service grows to a preset limit.

3.6.3 Messaging

The messaging layer is composed of channels. A channel is a component that processes a message in some way, for example, by authenticating a message. There are two types of channels: transport channels and protocol channels. Transport channels read and
write messages from the network. Examples of transports are HTTP, named pipes, TCP, and MSMQ. Examples of encodings are XML and optimized binary. Protocol channels implement message processing protocols, often by reading or writing additional headers to the message. Examples of such protocols include WS-Security and WS-Reliability.

3.6.4 Hosting and Activation

In its final form, a service is a program. Like other programs, a service must be run in an executable. This is known as a self-hosted service.

Services can also be hosted, or run in an executable managed by an external agent, such as IIS [6].

3.7 C#

C# is object oriented programming language run on the .NET Framework for creating traditional Windows client applications, web and networking applications. C# programs run on the .NET Framework, an integral component of Windows that includes a virtual execution system called the common language runtime (CLR) and a unified set of class libraries [7]. Source code written in C# is compiled into an intermediate language (IL) that conforms to the CLI specification. The IL code is very similar to java’s bytecode. That’s why C# is platform independent. When the C# program is executed, the assembly is loaded into the CLR, which might take various actions based on the information in the manifest. Then, if the security requirements are met, the CLR performs just in time (JIT) compilation to convert the IL code to native machine instructions. Code that is executed by the CLR is sometimes referred to as "managed code," in contrast to "unmanaged code" which is compiled into native machine language that targets a specific system. Also, it is used with XML based web services to improve productivity in the web development. That’s why I decided to use this language for development.

3.8 Development Platform

This thesis project is developed on the windows 8 operating system. I have used Visual Studio 2010 IDE. While generated application is platform independent and web based. It can be accessed from any platform like Linux, IOS, etc. where browser supports Silverlight.
CHAPTER 4
IMPLEMENTATION

4.1 PREPARATION FOR DEVELOPMENT
Following are the necessary setup done in order to start an application development

4.1.1 Visual Studio 2010 Professional
This is used as the primary Integrated Development Environment. Full installation of Visual Studio 2010 professional is done on windows 8 operating system.

4.1.2 Silverlight 5.0
After successful installation of IDE, Silverlight installed on the system

4.1.3 Bing Maps Silverlight Control
This is installed after Silverlight in order to use Bing maps in web based application

4.2 FUNCTIONAL FLOW
Figure 4.1 shows the basic workflow for overall application. The user starts with a webpage where he can see the world map. I am using Bing map service for the same.

Then user can enter the location of interest or he can just click on the location of the interest.

This first event causes circle to be drawn on the webpage in order to show location where he is clicked or interested. And then push pin is used at that latitude and longitude. Then corresponding address is sent to news service which is getting news from Bing News and Google News. This news then sent back to client for proper display. Client parses the response from server and displays it on web page.

Following sections 4.3, 4.4, 4.5 and 4.6 describe detailed front view and back end information.
4.3 START PAGE

An Application starts with default view as shown in Figure 4.2. I am using XAML based UI for developing web application. It gives user to update UI components without changing its underlying code. Also, in order to show news, I am creating CANVAS dynamically and adding events in it. Dynamic creation of CANVAS makes optimal usage of the memory and better application performance.

Currently application is hosted locally. In order to see news user can enter an address or can click on the map. User can enter an address in provided address textbox with format San Diego; 98005, USA; Bellevue, WA, 98005, USA etc. Menubar contains Help and about menu. Those are discussed in the section 4.7.

Figure 4.1. Functional flow of the project.
Bing map is Silverlight control and it is added by using following entry in the XAML file:

```xml
```

Figure 4.2. Showing default UI of an application.

This line indicates the XML namespace. I am using this in order to avoid the name conflicts. Assembly Microsoft.Maps.MapControl contains the Bing map related controls and APIs.

```xml
<Grid x:Name="LayoutRoot" />
<m:Map Name="MyMap" Grid.Row="1" Loaded="MyMap_Loaded"
HorizontalAlignment="Stretch" VerticalAlignment="Stretch"
CredentialsProvider="{StaticResource MyCredentials}" />
</Grid>
```
Above sample grid “LayoutRoot” is encapsulating the Bing map which is span over row 1 with horizontally and vertically stretched. When the map gets loaded it is calling ‘MyMap_Loaded’ event which is setting map to current zoom level 10.0 (0.0 <= zoom level <= 15.0). MyCredentials is the Bing map key. There are three types of the Bing keys available to use those are Trial Key, Basic Key and Enterprise Key. I am using Basic key which may qualify for non-profit public websites, education uses, and consumer applications such as Windows Store apps, Mobile, and other public websites [8]. This key is obtained from web portal bingmapsportal.com which manages all your Bing keys.

### 4.4 User Clicks on the Map

Figure 4.3 functional flow shows operations performed when user clicks.

![Flowchart](image)

**Figure 4.3. Data flow when user clicks on the map.**
Once map is loaded then user can perform click on the map activity. When user clicks, the view point is converted to location(latitude and longitude) by using the map object member function TryViewportPointToLocation. Which accepts view point as a input and return location in the Location object.

Once location is successfully extracted then by using reverse geocoding address is obtained. This address again feed to news service in order to get the news. For invalid address no results will be displayed on the map.

Figure 4.4 shows the end result when user clicked on the map. User can see the location name in green text. After getting valid location, push pin is used on that location and circle is drawn. Currently circle is having 20 miles radius which resembles to news within that area. I am using the Bing service and the Google rss feeds to get news.

Writing new news service is a complex and time consuming task. So, I decided to use existing Bing news and Google news in order to get the news. After reverse geocoding address is sent to news aggregator. Then news aggregator is fetching news from Bing and Google. After receiving news from both services news aggregator selects top 10 news and result is sent back to client side code. Figure 4.5 shows news fetching logic.
Along with news list, top news is displayed on the mouse enter event of a push pin. As shown in Figure 4.6 a news is displayed in the canvas. The canvas consist of stack panel and stack panel contains two text blocks. One is representing the title of the news and another is description. Title box is also having click event which will take user to the respective web site.
4.5 Display News

After getting news from news aggregator client displays them using the list box. When mouse enter event occurs on circle is displayed. Figure 4.7 shows the list of news in yellow background.

Circle is nothing but the polygon drawn by considering clicked location as a center. In geometry term it is known as Geofence. So, Geofence is the virtual boundary defined on geographics area. The unique feature of the geofence is that it triggers an event when boundary is entered or left by an entity. I have created polygon by using set of points and drawing it on the canvas. Then by using canvas event handler mouse enter and mouse leave events are handled. Actually, geofence could be the circle or it could be complex as like the boundary of the region. Figure 4.7 shows circular geofence.

Figure 4.7. New display when user hover mouse inside the circle.
When user clicks on the news control transferred to new tab, as shown in Figure 4.8. Each item in the list box is having click event. These events are added on the fly when news added into the list box.

4.6 USER NEEDS INFORMATION

In order to get help about how to use this application I have created web page. Figure 4.9 and Figure 4.10 are showing the same.

Figure 4.8. Shows when user clicks on the news.
Figure 4.9. Shows help menu.

Figure 4.10. Troubleshooting part of the help menu.
CHAPTER 5

FURTHER ENHANCEMENTS

This thesis project confirms the proof of concept of locating news on a world map. It has created a basic framework for enhancing current application very easily.

5.1 SHARING WITH SOCIAL NETWORKS

There are social networking sites that expose APIs for easy sharing. Sites like facebook.com and twitter.com can be considered for this. News displayed on a world map could be easily shared on these sites for quick attention of users.

5.2 INCREASING RADIUS OF GEOFENCE

Current news is displayed city wise. This can be extended by adding an extra feature so that the user can go from current city to state to region to country very easily.

5.3 DISPLAYING NEWS IN LOCAL LANGUAGE

Users can click on the any location on the world map. In order to target international users the news needs to be translated into the local language as an easy option.

5.4 UI DESIGN

Current UI can be modified for better look and feel. Only one push pin is showing and once a user clicks on some other location, previous contents were lost. If the user wants to see previous data, he needs to either enter address, or again needs to click on the same location. Also in order to accommodate feature 2.1 and 2.2, the UI needs modifications.
CHAPTER 6

SUMMARY AND OBSTACLES FACED

6.1 SUMMARY

The thesis project addresses the challenges of developing News On World Map. The thesis also addresses the integration of Bing maps using Silverlight and Bing news, Google news. Following are the features achieved from this project.

6.1.1 Web Based UI

Web based UI developed using Silverlight technology making it platform independent. This application can be accessed by using Internet Explorer, Firefox, Safari and Chrome on operating systems like Windows 8, Linux and iOS.

6.1.2 Reusability

Modular architecture, use of object oriented programming language and implementation of code using design patterns makes the project more reusable and easily extensible. One can easily use existing code for adding new news services. Also, due to WCF one can easily deploy server on different web servers to achieve better performance over a large number of clients, without affecting end users.

6.1.3 Integration

This thesis also studied and implemented wide range of current technology. Technology like news services and maps are integrated successfully to achieve the goal.

Being a legitimate combination in its implementation pattern, the project covers a fresh way to development across technologies. The basic project architecture, various assumptions made while designing this project are discussed in a comprehensive manner. I hope that the outcome of this thesis project make news browsers life more easy.

6.2 OBSTACLES FACED

Following are the challenges faced during thesis project development.
Restricting the scope of the project was the biggest challenge for me. There were many applicable features suggested initially. The limited time and resources available to me restricted me to focus on developing a proof of concept, and developing an underlying framework for extensibility.

Identifying news sources and technologies to develop thesis project was a tough task. Many things were new to me. Studying them and integrating was a bit time consuming. Silverlight is very secure and restricts client side code from accessing certain resources (e.g. file writing, creating new dialogue windows, etc). Finding a way around for such obstacles, and debugging whole thesis project was challenging.
CHAPTER 7

CONCLUSION

This application will hopefully make it easy for the users to browse news on a world map. It includes the very easy news viewing feature and links to news original resource. Here I tried achieved following features from this project

7.1 EASY TO EXPLORE NEWS

The user can easily browse news from any location from the world. He just needs to click on the map or enter the location.

7.2 EASILY AVAILABLE

Means it could be easily accessible from any operating system such as Windows, MAC and Linux. Also it provides multiple browser supports. I have used Silverlight and Bing map as basic underlying map technology.

7.3 EXTENDABLE

As current scope of the project is limited due to time and resources available to me. By considering the various future features (discussed in chapter 5) in mind I have created placeholders for them. I can easily add new news services in order to get the local news. All are news in the list having individual event. These events are added dynamically which makes easy to write news sharing option on social networking.
REFERENCES


