Mapping of Field Visitors Locations on Google Map with Java Script

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Abstract – Java Script is very popular and adopted universally by every web browser for its support which allows dynamic content to get execute in a webpage. With this, we can do miracles in websites with the help of very small server side code. In this paper various, methods described to retrieve information and Visitors Location on Google Map with the help of Geo Location API. A comparative analysis has been done. This paper mainly focuses on the strength of Java Script.

Keywords: GeoLocation, API, GPS, Google Maps, Internet Protocol, Web Data Collection.

I. INTRODUCTION

Now most of the private and public sectors conducting surveys on different aspects, for example Village Development, Start Corporate Business etc. they are collecting the lifestyle of families living in special village or city by sending their agents. This data collection is done with the help of Mobile. Now, Mobile data collection (MDC), Web Data Collection (WDC) portals enable data collection process faster and easier than ever before. You are simply creating data collection projects and custom forms that are accessible through the Mobile Data Collection app or websites. Share projects with other users, and create reports that contain all of the data and media collected in one place.

In this aspect we can do a usability test, it means how people do specific tasks and the problems they experience when using particular system. If you go to someone's site to run a usability test, that doesn't mean that you're doing contextual inquiry. You're doing an on-site usability test.

In contrast, a contextual inquiry focuses on the big picture: how people or field visitors do their job, the workflow across multiple channels, their behaviours, needs, goals and pain points. With the field visit you are trying to understand the user experience- this is bigger than the usability of a particular system. You might also carry out a contextual inquiry when there is no system in place yet for a new kind of service. So you couldn't usability test it even if you wanted to.

When ever you do qualitative, small sample research, there's always a risk that your sample will not be representative. So you have to take certain precautions to minimise the risk.

So this contextual enquiry can do with the help of advanced web technologies like Mobile Tracking, Website User Visits etc.

This paper is aimed to provide the importance and Java Script for contextual enquiry of the field visitors for different organizational data collection process. How simply we can monitor the field visitors working status and their job on our computer datashboard.

II. CONTENTS OVERVIEW AND DEFINITIONS

JavaScript: JavaScript is a language commonly used in web development. It was originally developed by Netscape as a means to add dynamic and interactive elements to websites. While JavaScript is influenced by Java, the syntax is more similar to C and is based on ECMAScript, a scripting language developed by Sun Microsystems.

JavaScript is a client-side scripting language, which means the source code is processed by the client's web browser rather than on the web server. This means JavaScript functions can run after a webpage has loaded without communicating with the server. For example, a JavaScript function may check a web form before it is submitted to make sure all the required fields have been filled out. The JavaScript code can produce an error message before any information is actually transmitted to the server.

GPS: The Global Positioning System (GPS), also known as Navstar, is a global navigation satellite system (GNSS) that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. The GPS system operates independently of any telephonic or internet reception, though these technologies can enhance the usefulness of the GPS positioning information. The GPS system provides critical positioning capabilities to military, civil, and commercial users around the world. The United States government created the system, maintains it, and makes it freely accessible to anyone with a GPS receiver.

Geolocation: Geolocation is the identification of the real-world geographic location of an object, such as a radar source, mobile phone or Internet-connected computer terminal. Geolocation may refer to the practice of assessing the location, or to the actual assessed location. Geolocation is closely related to the use of positioning systems but may be distinguished from it by a greater emphasis on determining a meaningful location (e.g. a street address) rather than just a set of geographic coordinates.

Google Map: Google Maps[1] is a desktop web mapping service developed by Google. It offers satellite imagery, street maps, 360° panoramic views of streets (Street View), real-time traffic conditions (Google Traffic), and route planning for travelling by foot, car, bicycle (in beta), or public transportation.

IP Address: IP address is short for Internet Protocol (IP) address. An IP addresses an identifier for a computer or device on a TCP/IP network. Networks using the TCP/IP protocol route messages based on the IP address of the destination. Contrast with IP, which specifies the format of packets, also called datagram, and the addressing scheme.

The format of an IP address is a 32-bit numeric address written as four numbers separated by periods. Each number can be zero to 255. For example, 1.160.10.240 could be an IP address.

API: Application Programming Interface (API)[2] is a set of subroutine definitions, protocols, and tools for building software and applications. A good API makes it easier to develop a program by providing all the building blocks, which are then put together by the programmer. An API may be for a web-based system, operating system, database system, computer hardware, or software library. An API specification can take many forms, but often include specifications for routines, data structures, object classes, variables, or remote calls. POSIX, Microsoft Windows API, the C++ Standard Template Library, and Java APIs are examples of different forms of APIs[3]. Documentation for the API is usually provided to facilitate usage.

III. FUNCTIONAL SCENERIO

1. Detect / find the IP Address of the client / user machine using JavaScript.

Example :

```
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<title>IP Address</title>
<script type="text/javascript" src="http://l2.io/ip.js?var=myip"> </script>
<script>alert("Your IP Address is:"+myip);</script>
</head>
<body>
<form> </form>
</body>
</html>
```

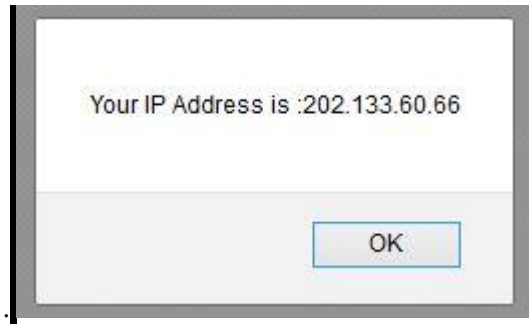

Fig 1. Output of above java script

2. Get Current Location Latitude and Longitude using JavaScript.

The HTML5 GeoLocation API in browsers that support HTML5 GeoLocation feature and determine the current location i.e. Latitude and Longitude co-ordinates using JavaScript[4].

These Location coordinates i.e. Latitude and Longitude can be used to display the User's current location in Google Maps[5] in our website using JavaScript.
Example:

```
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<title>User Location</title>
<script type="text/javascript" src="http://maps.googleapis.com/maps/api/js?sensor=false "></script>
<script type="text/javascript">
if (navigator.geolocation) {
navigator.geolocation.getCurrentPosition(function (p) {
var LatLng = new google.maps.LatLng(p.coords.latitude, p.coords.longitude);
var mapOptions = {
center: LatLng,
zoom: 13,
mapTypeId: google.maps.MapTypeId.ROADMAP
};
var map = new google.maps.Map(document.getElementById("dvMap"), mapOptions);
var marker = new google.maps.Marker({
position: LatLng,
map: map,
```

```
title: "<div style = 'height:60px;width:200px'><b>Your location:</b><br />Latitude: " + p.coords.latitude + "<br />Longitude: " + p.coords.longitude
});

google.maps.event.addListener(marker, "click", function (e) {

var infoWindow = new google.maps.InfoWindow();
infoWindow.setContent(marker.title);
infoWindow.open(map, marker);
});
});
} else {
alert('Geo Location feature is not supported in this browser.');
}
</script>
<div id="dvMap" style="width: 500px; height: 500px">
</div>
</head>
<body>
<form>
<span id = "ipaddress"></span>
</form>
</body>
</html>
```

Output:

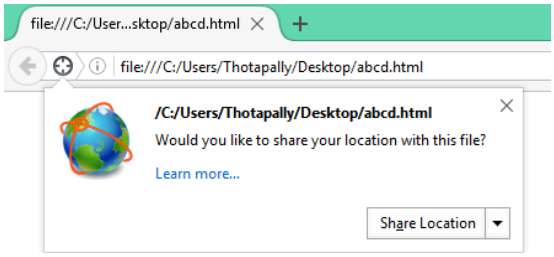

Fig 2: Share Current Location

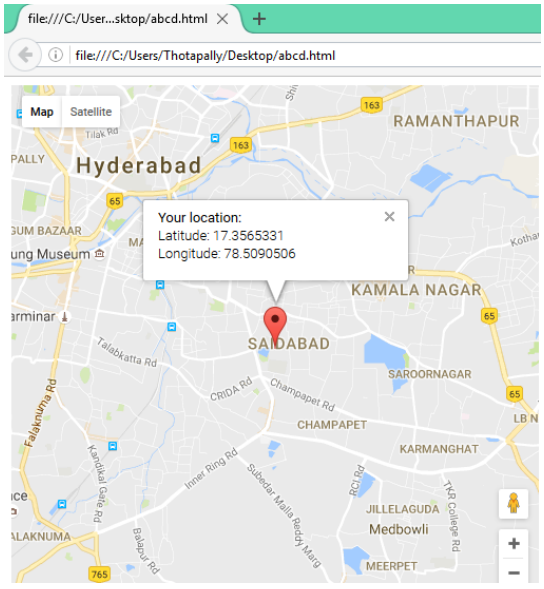

Fig3: Show the Current Location of the User

3. Get Multiple Locations of Users Latitude and Longitude using JavaScript.

```
<!DOCTYPE html>
<html>
<head>
<meta http-equiv="content-type" content="text/html; charset=UTF-8" />
<title>Google Maps Multiple Markers</title>
<script
src="http://maps.google.com/maps/api/js?sensor=false"
type="text/javascript"></script>
</head>
<body>
<div id="map" style="width: 500px; height: 400px;"></div>

<script type="text/javascript">
var locations = [
['Bondi Beach', -33.890542, 151.274856, 4],
['Coogee Beach', -33.923036, 151.259052, 5],
['Cronulla Beach', -34.028249, 151.157507, 3],
['Manly Beach', -33.80010128657071, 151.28747820854187, 2],
['Maroubra Beach', -33.950198, 151.259302, 1]
];

var map = new
google.maps.Map(document.getElementById('map'), {
zoom: 10,
center: new google.maps.LatLng(-33.92, 151.25),
mapTypeId: google.maps.MapTypeId.ROADMAP
});

var infowindow = new google.maps.InfoWindow();

var marker, i;

for (i = 0; i < locations.length; i++) {
marker = new google.maps.Marker({
position: new google.maps.LatLng(locations[i][1], locations[i][2]),
map: map
});

google.maps.event.addListener(marker, 'click', (function(marker, i) {
return function() {
infowindow.setContent(locations[i][0]);
infowindow.open(map, marker);
}
})(marker, i));
}
</script>
</body>
</html>
```

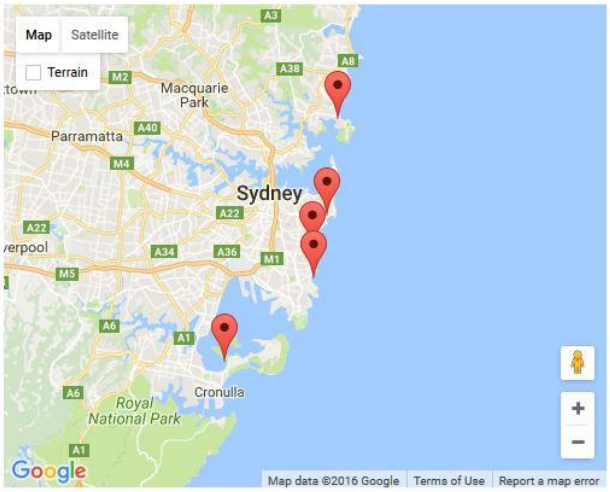

Fig4 : Multiple Markers with user data

4. Get Multiple Locations of Users Locations using JavaScript.

```
<!DOCTYPE html>

<html>

<head>
<meta charset="utf-8">
<meta http-equiv="X-UA-Compatible" content="IE=edge,chrome=1">
<title>Multiple Markers Google Maps</title>
<script src="http://ajax.googleapis.com/ajax/libs/jquery/1.9.0/jquery.min.js"></script>
<script src="https://maps.googleapis.com/maps/api/js?v=3.11&sensor=false" type="text/javascript"></script>
<script type="text/javascript">
// check DOM Ready
$(document).ready(function() {
// execute
(function() {
// map options
var options = {
zoom: 5,
center: new google.maps.LatLng(39.909736, -98.522109),
// centered US
mapTypeId: google.maps.MapTypeId.TERRAIN,
mapTypeControl: false
};

// init map
var map = new google.maps.Map(document.getElementById('map_canvas'), options);

// NY and CA sample Lat / Lng
var southWest = new google.maps.LatLng(40.744656, -74.005966);
var northEast = new google.maps.LatLng(34.052234, -118.243685);
var lngSpan = northEast.lng() - southWest.lng();
var latSpan = northEast.lat() - southWest.lat();

// set multiple marker
for (var i = 0; i < 250; i++) {
// init markers
var marker = new google.maps.Marker({
position: new google.maps.LatLng(southWest.lat() + latSpan * Math.random(), southWest.lng() + lngSpan * Math.random()),
map: map,
title: 'Click Me ' + i
});

// process multiple info windows
(function(marker, i) {
// add click event
google.maps.event.addListener(marker, 'click', function() {
infowindow = new google.maps.InfoWindow({
content: 'Hello, World!!'
});
infowindow.open(map, marker);
});
})(marker, i);
}
})();
});
</script>
</head>
<body>
<div id="map_canvas" style="width: 800px; height:500px;"></div>
</body>
</html>
```

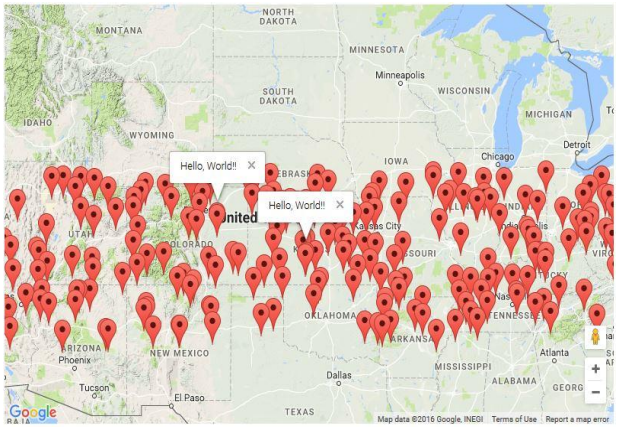

Fig:5 All the Users info with their location name

IV. CONCLUSION

Therefore, from our present experimental study, it was concluded that using minimum functions of Java Script, these scripts we can embed with any object originated

programming languages like java, C# we can do miracles with less code. With this knowledge we can develop mobile based apps as well as website with all the available dynamic data.

V. FUTURE SCOPES

Street View for nature trails and 3D Google Earth maps are all improvements coming to Google Maps in the near future. Offline mapping will become a part of Google's "own global base map" and offer hi-res navigation without needing a WiFI or 3G or 4G connection. To use the feature, users will have to select the area they plan to visit before going offline, and then download the map to their device.

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