GPS tracking

system

Software Requirements Specification

Version 1.0

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# 1: Introduction

**1.1 Problem Definition:**

This system is a combination of web as well as android application where the user will be using the android application and admin will work with web application. The user will have this application in his android phone, when the user will login to the system his GPS location will be send to the admin where admin will view GPS location in web application and when logout the system again the GPS location will be send to the admin. In order to keep track of the attendance as well as payroll of the user, this system plays a major role. The role of the admin is to add new user by entering his personal details and admin will provide the user with identity number and password to the user so that he can access the application in his android phone. Admin can view the GPS location of the user by entering user Identity Number as well as Date. Admin can check the salary of the particular user by entering date and employee ID. Admin can view latitude and longitude of the GPS location sent by the employee. Admin can change the password of the employee. This application helps admin to easily check the salary of the employee. Since GPS location of the employee is tracked, so employee will not attempt to add proxy attendance.

## 1.2 Purpose

This document describes the software requirements of a GPS tracking system. It is intended for the designer, developer, and maintainer of the GPS tracking system.

**1.3 Scope of the Development Project**

The product that will be developed is a GPS Tracking System. This product uses both hardware, software, and many technologies to support the task at hand. This product will be able to have add-ons specific to the needs of various industries. We will not implement add-ons for all the different possible users of this product. We will however implement add-ons for one or two industries like the car rental agency or a trucking company.

**1.4 Definitions, Acronyms and Abbreviations**

**GPS:** Global Positioning System is a worldwide radio-navigation system formed from a constellation of 24 satellites and their ground stations.

**GPS Receiver:** Electronic device that creates data strings based on satellite positions that contain data on: latitude, longitude, speed, heading, signal strength, and many other pieces of information.

**Longitude:** The angular distance east or west of the earth's equator, measured in degrees along a meridian, as on a map or globe.

**Latitude:** The angular distance north or south of the earth's equator, measured in degrees along a meridian, as on a map or globe.

**Web Client:** A computer interface that's utilizing a Web Server. Our web client will connect to our tracking information web server page. This page will contain information on every GPS coordinate for the specified login. This client will also have mapping where a user can

visually see their mobile phone move on the map.

**Phone Client:** This is the software that will be in the mobile phone. This application will be in charge of communicating with the GPS receiver, parsing the data and then sending it to our server.

**Database:** A collection of information stored in a computer in a systematic way. This will refer to a place on our server.

**SQL:** Structured Query Language (SQL), pronounced "sequel", is a language that provides an interface to relational database systems.

**PHP**: PHP or Asynchronous JavaScript, AJAX and XML is a term describing a web Development technique for creating interactive web applications.

**PHP Connectors:** API's used for communicating with different databases written in PHP language.

**Web Server:** A computer, including software package, that provides a specific kind of service to client software running on other computers. Our Web Server will receive data requests from all our different client types.

**Active Server Page(ASP):** ASP is also an abbreviation for application service provider. An ASP is an HTML page mere scripts that are processed on a Microsoft web server before the page is sent to the user. An ASP application in that all involve programs that run on the server, usually tailoring a page for the user. An ASP somewhat is somewhat similar to a server side include or a common gateway interface(CGI) application in that all involve programs that run on the server, usually trailering a page for the user. Typically, the script in the Web page at the server uses input received as the result of the user’s request for the page to access data from a database and then builds or customize the page on the fly before something sending sending to the requestor.

**Google Maps:** A free, online map service provided by Google at

<http://maps.google.com>.

**User ID:** This will be an Alphanumeric string Created for user by admin and for admin it will be predefined that may be changed by admin further.

**Password:** This can be any predefined character string created by admin corresponding to User Id that can also change by user or admin.

**1.5 Overview of Document**

Section 2 contains the different types of users that will be using our product. It describes the hardware requirements, functional requirements, Data Requirements, Constraints, and some use case scenarios of how the user will be interacting with this product.

Section 3 contains details of the functional requirements. It contains the data requirements such as the interfaces the user will be working with and the information contained at each level. It also contains information about the performance requirements and the quality attributes that will be used in the release of the product.

1. **General Description**

**2.1 User Personas and Characteristics**

Our product will potentially have many users, as there may be many add-ons to the product each one catering to different types of users in various industries.

**Home User** – A user who wants to use the product to keep track of his vehicles at home. They won’t need to have extended functionality.

**Company Employee** – This is a user who uses the product to make his life easier and to perform specific tasks. Such tasks for a Rental Agency, for example, would be to keep track of all the vehicles in the arsenal and see if any of the vehicles goes out of a specific geographic area.

**Company Manager** – This user will need the ability to add more vehicles in his arsenal of vehicles to manage, or to remove a vehicle from the arsenal.

**2.2 Product Perspective**

1.The web server will run on ASP The Pocket PC portion will be run on the .Net Compact Framework.

2.The Vehicle Client will need an internet connection to upload currentGPS coordinates.

3.The product will utilize AJAX, PHP and Google Maps.

4.The product will have limited use on a personal digital assistant(PDA) that the user must supply.

* 1. **Overview of Functional Requirements**

1. Input GPS Coordinates in Database in a structured format.

2. View GPS locations using AJAX, PHP & Google Maps.

3. Look-up user id and retrieve information related to user.

4. Admin can login and add user, remove user, and see user associated with their account.

5. **View statistics:** user distance from admin, locations, etc.

6. Multiple interfaces to interact with the data (Web, Client, PDA )

7. Provide different levels of access based on the users security (restrict viewing, administrative, etc.)

**2.4 Overview of Data Requirements**

Users will be able to set up a login name and password to access our system. Interfaces to our system will include a Web version, Client version and PDA version. Users will be able to check the location, distance, location history etc. and view their information on visual maps provided by Google Maps.

**2.5 User View of Product Use**

**Scenario 1 (the vehicle client):**

*This scenario occurs when a user turns on their vehicle and then turns on their car computer, or waits for their car computer to turn on its self:*

Vehicle client starts with android. Excluding the initial setup of the vehicle client there should be no need for human interaction. The application will run in the system tray and upload its positional information to the server, anywhere from 15 seconds to 5 minutes apart. If this is an employee of a company that is using our software then they will possibly need to log in with their vehicle ID and/or their employee ID. After login an interface will be there using that the employee can see details such as

latitude/longitude, distance, direction and satellite positional information.

**Admin Setup for vehicle user :**

The Company Manager or Home User logs into the web client or desktop client and wants to add another vehicle to his list of vehicles. He enters the vehicle information into the system and selects to save the vehicle. The system then stores the new vehicle information and attaches it to the user. The new vehicle is now listed in the users list of vehicles in his arsenal.

The Company Manager or Home User just sold a vehicle in his arsenal. He doesn’t want the vehicle to show up in the list anymore since he no longer cares where the new vehicle will be. The User logs into the system and selects to remove a vehicle from his list of vehicles. The vehicle no longer appears in his arsenal of vehicles.

**Scenario 2 (the web client):**

This scenario occurs when either a consumer or a company employee, using our software, logs into our tracking page using their login information:

The user will log into the tracking page. If this is a consumer’s login then they will be presented with tracking information for their own. The user will be able to select from a calendar the day from which they wish to see their positional logs. Upon selecting the day a list box will be filled with GPS fix times. The user will be able to select a time and see positional information like: latitude/longitude, direction, and distance. If the login information is for a company employee using our product they will be presented with a page that will allow them to select from specific vehicles and different tickets. Each vehicle page will be similar to the consumer vehicle page. Inside the ticket section of the web client the user will be able to view

and edit ticket information for dynamic tickets set up by the company using our product. They will be able to select what type of information will be used in their tickets (i.e. customer address, ticket number, product, cost etc..) depending on what industry they are in.

**3. Specific Requirements**

**3.1 External Interface Requirements**

User application will be run using any up to date Web Browser. The GPS System will communicate with the computer in the car which will upload the coordinates to the web server.

**3.2 Detailed Description of Functional Requirement**

**Template for describing functional requirements**

**3.2.1**

**Purpose:** Startup (All Automatic)

**Inputs:**

Coordinates from GPS, the operating

system running with the vehicle client

program running.

**Processing:**

Coordinates from GPS, the operating

system running with the vehicle client

program running The application will run

in the system tray and upload its positional information to the server, anywhere from 15 seconds to 5 minutes apart. It will then continue to request from the GPS the current GPS Coordinate and upload the coordinate to the server

**Outputs**

The GPS Coordinates will be uploaded

and stored on the Web Server in the

database

**3.2.2**

**Purpose:** Mini-Mode option on Vehicle Client

**Inputs:** Vehicle ID and Login

**Processing:** The Vehicle Client will verify the Vehicle ID and Login

**Outputs:**

A small screen will show up near the taskbar showing the status of the GPS

signal.

**3.2.3**

**Purpose:** Mini-Mode Detailed option on Vehicle client

**Inputs:** User Logs in as in 3.2.2, and double clicks the small window

**Processing:** The Vehicle Client will calculate theLatitude/longitude, speed, direction and satellite positional information from the GPS coordinates being collected and previous coordinates collected recently and or from the database. The vehicle client will gather from the GPS device and/or the web server

**Outputs:** The Screen will display the followinginformation latitude/longitude, speed, direction and satellite positional information

3.2.4

**Purpose:** Login to the Tracking Page using the web interface

**Inputs:** User Name and Password

**Processing:** The Web Browser communicates with the web server. The Web Server then validates the user's name and password.

**Outputs:** User will be able to view and update one’s information.

3.2.5

**Purpose:** Display Client Tracking Information

**Inputs:** User ID

**Processing:** The Web Server will get from thedatabase the information about the User ID

**Outputs:** A map will show up displaying the current location of the user.

**3.2.6**

**Purpose:** Get known information times for the given day.

**Inputs:** The User ID and date will be passed to the web server

**Processing:**

The Web Server will gather the times of known locations and return the known locations to the Admin

**Outputs:** A dot will be displayed on the map so the admin canselect more information contained at thatpoint in time by clicking on the dot.

3.2.7

**Purpose:** Get detailed information about projects , contact details.

**Inputs :** The User ID

**Processing:** The Web Server will gather information about all activities to which an user is related.

**Outputs:** The admin will see the following..

*Information:* projects, contact details etc. Also the admin will be able to see the location on a map.

**3.3 Performance Requirements**

Each User will only have one web client. The Web Server (accessible by Admin) will be able to handle any number of Users updating to the server, and any number of users logged in. The Database will need to support a lot of different GPS coordinates and keep track of what coordinates go with what User.

**3.4 Quality Attributes**

A history of known issues will be kept as the project goes on. We will keep track of when the item is fixed, and all the issues will have a current status. For the product to be finished, 90% of the known issues will be fixed. All the high priority items will also be fixed. This will allow for a stable product. We will perform unit tests on the different modules before integrating. A history of the unit tests will also be kept. Each of these documents will be available for edit by team members, and by none else. Security to the Web App will be of utmost importance. We will verify that users without a valid matching user name and password will not be able to access and change other users’ information.

**Advantages:**

* 1. This System helps the admin to keep track of the employees who go for field work.
* 2. Since GPS location of the employee is tracked, so employee will not attempt to add proxy attendance and thus maintain discipline.

**Disadvantages:**

* 1.All employees must have an android phone to use this application.
* 2.In case the mobile phone is switched off tracking will not be possible .
* 3.In case data connection has not been established tracking will not be possible.