1 Hardware and Software

The main product shall take the form of an "Android app" - a self contained program running on an Android mobile device. This is what the user will directly interact with. Our product will also require a central server in order to function, and a web server to support a website with additional functionality. The Android app must be able to transfer information to and from the central sever.

1.1 Android Application

1.1.1 Hardware

The device provided for testing the Android app is a HTC Desire C, and the application should perform well on similar devices. This device is considered a very basic model, and the majority of handsets that we are targeting are at least as capable. If an application functions well on the Desire C, it will function well on most devices. The relevant hardware capabilities of the Desire C are listed below[**?**]:

- Screen Resolution: 320 x 480 pixels
- Processor Speed: 600MHz
- Memory: 512MB
- SD Card Storage: 4GB +
- Battery Life: 10 - 20 hours of active use
- Internal GPS Antenna

The app is unlikely to require more capable hardware than what is provided by the device because any intensive processing of data can be offset to the central server. The most that the device will need to handle is some trivial real-time graphical operations, and for that the hardware is more than adequate. Memory should not be a concern because the device has a relatively large amount for a hand-held device, and this product will not require excessive amounts of data to be stored. The app should not exhaust the battery supply of the device to a prohibitive extent, and some effort should be made during development to limit the usage of battery draining resources. The product requires the ability to find its current position using a GPS system, which is an ability of the testing device.

1.1.2 Software

The application will be written in the programming language Java using the development environment Eclipse, and will target the Android operating system version 4.0 as a minimum as specified by the client. Java will be used because it is the language the application developers are most proficient in, and Eclipse was chosen for its superior support for developing Android applications using the Android Developer Tools plugin.

1.2 Central Server

1.2.1 Hardware

The central server program will reside on a conventional computer, and because this one machine will handle all client requests it will need much more advanced hardware than the mobile devices. This server shall have internet connectivity in order to communicate with the Android app clients. The server will also need to be almost constantly active, with downtime only occurring at times of the day when few clients will want to connect. The machine running the server requires a large upload bandwidth in order to service many clients in a small time frame, and this should be complemented by a high enough CPU and memory access speed to reduce the processing time of client requests. A lower bandwidth can be compensated for by reducing the size of data being sent to clients. The server should have enough free storage space to allow for expansion of the product to cover more area of the world. At a minimum, the server must have at least two processor cores to utilize multi-threading in the server software, 2 GB of memory to be able to process a lot of data simultaneously and also support the operating system, 16GB of available storage space to hold account and game data.

1.2.2 Software

The server will be written in the programming language C♯, and built on the .NET Framework version 4.5 using the Visual Studio 2012 development environment. C♯ was chosen for its superior performance relative to Java, and because it is the language the primary server developer is most experienced with. Visual Studio 2012 will be used for its support of both the .NET Framework 4.5 and many tools to aid development.

1.3 Website

1.3.1 Hardware

The web server will need to be hosted on the same machine as the game server to allow rapid transferral of data between them. This means the server will need the same hardware capabilities.

1.3.2 Software

The web server software will need to serve HTML pages with dynamic content pulled from the game server's data. Because the game server is also servicing HTML requests, they may be merged into one program. This means the software requirements are the same as for the central server. The dynamic portion of the server will be written in C♯, using the same development environment as the central server. For clients accessing the website, they will need a web browser that supports the HTML 5 Canvas element. This includes the latest versions of Chromium, Firefox, Opera, Safari and Internet Explorer.