**Requirements Elicitation for Railway Network Management System**

**Overview**

The client has requested development of a web based system which calculates the most efficient train route dependent on the users starting and destination points, and date and time of travel. It is essential that the website be useable by the majority of the population, and the instructions be clear and easily understood. The design must allow for future changes in the train network as new stations and timetables are implemented.

This document sets out the initial questions necessary to produce a detailed specification of the design. Functional and non-functional requirements are outlined, and key stakeholders in the project identified. Where information is missing from the initial outline of the project, assumptions have been made or further questions are listed.

**Functional Requirements for the user**

High Level Requirements

1. System calculates the fastest route between any two stations, taking into account any transfer times
2. Search displays additional routes which arrive at the destination at similar times to give user more options
3. The search is based on the fields entered by the user (start, destination, date and time of travel)
4. Accessible on all the most commonly used operating systems and web browsers in the UK (over 90% of market share)
5. Suggested journey will be displayed in a generic, easily understood format
6. Shows the timetable for dates up to 3 months ahead (and advises if any changes to the rail network are expected in that time)
7. User can expect the site to make clear where mistakes may have incurred (e.g. Entering Newcastle will question whether Newcastle Upon Tyne or Newcastle Under-Lyme)
8. Allow user to see earlier or later trains available past those initially displayed
9. User should be able to modify the location or date of their search without having to create a new query
10. Users will have the option to print the train map/instructions

Other requirements to consider

1. Allows simultaneous search for return journeys
2. User can have the option to receive text/e-mail updates about changes to the timetable or delays on the network
3. Auto completes train stations after a number of characters entered (e.g. ‘New’ suggests autocomplete of ‘Newcastle Upon Tyne’)
4. The user can search by starting post code to finishing post code and the correct train route would still be displayed
5. Produces notice when changes to the rail network are likely to affect their future journeys
6. Suggests cheaper times of travel
7. Registration page so that the user can login and see the timetable for their frequent journeys

**Non-functional Requirements**

1. Must be accessible 24/7. Website must be online above 99% of the time.
2. Database must hold up to date information about all train timetables, train stations, and journey times for each train, and be able to identify shortest route
3. Result displayed must be the fastest option available to the user on above 99% of queries, and users must have a method of reporting back to the developers when they believe a better route is available (aim to be able to report bugs in under 3 clicks and requesting a short text summary from the user)
4. No computing expertise must be required by the user to perform a query search
5. The code has to comply with all accepted web browsers and operating system standards and not require additional software to function
6. System must be easily updateable
7. Developing a secure login and other measures to assure users personal data is encrypted
8. To ensure search refers to an up to date timetable, searches will time out after an hour of no user interaction and user will have to input the search query again

**Design Constraints**

The website needs to be viewable on multiple platforms and be quickly adaptable when new platforms are created. The site needs to work with smartphones and tablets, and the coding must be efficient enough to allow seamless page transitions over slow internet or a 3G network.

Assumptions have been made to the reliability of the rail network, however as the project develops it may be necessary to factor in real time updates and explore how the system can be updated to cope with delays and cancellations and how the user would expect notification in these circumstances.

**Key Stakeholders**

Stakeholders are any group with a potential interest in the project. Discussions with these groups are required to ensure that the system is developed to perform the function it has been commissioned for. The primary stakeholders have been identified as –

**The client** - The company which is paying for the system to be developed. Their motivations need to be established.

Questions for the client

* What is the primary purpose for developing the system?
* What is the timescale and budget for project completion?
* What is the number of daily users expected?
* What is the maximum number of users expected to access the site at any given time?
* Is the client expecting to make revenue through the site?
* Is there an expectation that customers will be able to purchase tickets through this site, or link to other websites where tickets can be bought?
* Will the site require advertising?
* Will the client be hosting the webserver themselves or requiring cloud servers?
* Is an application required for mobile devices? Would this be released simultaneous with the website?
* English is assumed to be the primary language, are any other languages to be included?
* Are local train networks to be incorporated in the users travel map (e.g. linked to Metro or London Underground)
* Should a message with ‘user friendly’ instructions be available for a user who requests this (e.g. a user arriving at Newcastle Airport might want to know basic instructions such as – ‘make sure you have change ready when you get to the Metro barrier’)?

**The end user** – The user is the person who will log onto this system to find the most ideal train route for their journey. Whilst it is assumed that the vast majority will be familiar with how UK trains operate, some may not. A sample of users will need to be taken ranging from people who regularly travel to people with little experience.

Questions for the end User

* How do users currently find out about train timetables? Why this way?
* How are users with visual impairment finding this information?
* Do users feel the current systems are adequate?
* Are there any features that users feel are currently missing?
* What is the most convenient platform to find this information (telephone/mobile app/internet etc.)?
* Would a user use a site to get a time table if it did not allow them to then purchase a ticket?

**Competitors** – For this documents purpose the competitors have been defined as companies who are offering websites that query train timetables. For example www.TheTrainLine.com and [www.NationalRail.co.uk](http://www.NationalRail.co.uk).

Questions about competitors

* The competitors current systems must be analysed to see what similarities they share as it is to be assumed they have all gone through the same process of tweaking their sites over time based on what appeals to users
* If the clients wish to monetise from this site which ways are competitors currently doing this? Is taking commission from sales and advertising viable?
* What are the unique selling points of these sites which prove popular and differentiate them?
* What are these sites currently missing?

**Train Operators** – Train operators such as Virgin and GNER would have an interest in this site as they would hope to use it as a way of promoting customers to use their service.

Questions for and about the train operators

* If the website was able to direct custom to them would they be willing to pay a commission?
* Would the train companies and clients be interested in advertising on the site to give themselves increased prominence?
* Can they provide real time information on the schedule of their trains if delayed?

**Key Points following discussions with stakeholders**

* If the client wishes to sell tickets on this site then an enhanced study will be required. As an outline it will need discussion with current network operators, a review of UK law surrounding online payment, developing (or licensing) an online payment method, and enhanced security to protect customers financial details.
* Selling tickets online is likely to result in other types of needs for the client, such as more staff to deal with queries and regulated procedures for payment disputes. Whilst not within the scope of this project, it is something the clients need to consider.
* If local train networks are to be included links will need to be made to ensure the developers are informed of any changes.
* An assessment of disability discrimination law may be necessary to ensure all the websites procedures are compliant and can be navigated by those users.