

Requirements Document

**Software Hut, Team 03
Fizzilink
(Extreme Programming)**

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Requirements Document

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Introduction:

The system referred to in this document is a system to provide a method of linking together physiotherapists and their customers throughout the country, via the Internet [7], automating the process of appointment booking.

Please note:

Throughout this document, there will be words referenced at the end with definitions. These words will appear in the document with '[x]' after the word, where the 'x' relates to a number. Any words defined will only have the '[x]' on the first occurrence of the word in this document.

Problem:

Many physiotherapists work on their own, and have small practices, which may not be able to afford to employ a receptionist, in which case a booking for the physiotherapist will have to be taken, usually over the phone, by the physiotherapist. This can cause problems, especially if the physiotherapist is currently working with another patient. If the physiotherapist does not answer the call, there is a possibility of a loss of business, and yet, if he were to answer the phone, then it may be deemed to be rude by the customer the physiotherapist is currently attending to.

Brief:

The client wants a system that will allow a general member of the public to book an appointment with a physiotherapist in their area over the Internet. The system must be able to return a list of registered physiotherapist practices[17] in the area[1] they choose, and they must be able to choose a practice and a physiotherapist that they want, and book an appointment in a free slot of the physiotherapist's diary. Following the customer's choice of diary slot, they will be led to a secure payments[19] page, at which point they will enter their credit card details, and will have an appointment booked for them, (provided that the transaction[22] completes successfully).

The proposed system aims to automate the process of booking appointments with physiotherapists. This will make the entire ordeal much more efficient for both the physiotherapist and the customer. It should also allow for more business for the physiotherapists as they will no longer be losing as many appointments from missed telephone bookings.

Registration:

The system will require that both the physiotherapist and the customer are both registered before they may use the system. The process of registration for both parties, however, is very different. The customers will register themselves, filling out their personal details. An account for them will be created, with a password. This account will be stored in a database[5] to be recalled every time the customer logs in[12].

The registration process will be different for a physiotherapist. The registration part of the system for them will require them to register the practice, and not each individual physiotherapist in that practice. The person who registers that practice will have administration rights for that practice, which will mean that they will be able edit various parts of the details represented with the practice. It will be from here that the administrator will be able to add the physiotherapists of the practice. For a small

practice, the administrator could be the only physiotherapist, but for a larger practice, there may be a secretary. This administrator would be able to add a profile for all the physiotherapists that work in that particular practice. These profiles will be stored in a database. An individual diary will be available for each physiotherapist in that practice. This diary may be accessed and updated by a physiotherapist when they log in.

On top of there being a profile page for individual physiotherapists, it will also be possible to have a profile page for the actual practice, giving details about it, such as, address, history of the practice, when established, etc. This page will be updateable but the Practice Administrator at any time. It will be made from a pre-defined template, keeping a certain standard to all the pages. This template would also have the advantage of allowing inexperienced people with the Internet to create an information page easily.

It would be required that each time the customer came to book an appointment that they would have to log in. This is simply done for security purposes.

Appointment Booking:

There are, in general, two types of appointments that may be booked by a customer. These simply depend on whether a customer is attending the practice for the first time, or whether they are returning. If this booking is the first the customer has made, then the booking will be required to last forty five minutes. If the customer has been before then the duration of the appointment will be a fixed length of thirty minutes.

The booking process will require the customer to choose a practice in a location around them, before they can proceed to the stage of actually booking the appointment. In this system, the idea is that a customer will select their county, and in doing so will have a list returned to them with a list of cities in that county that have physiotherapists registered in them. The customer will then be able to select a city of their choice, and from that will receive a list of all the practices registered in that city. The customer will then be able to select a practice of their choice, and from that will be led on to the appointment booking stage. The appointment booking stage will require that the customer selects a date and time for their appointment. If it is their first consultation, then the system will assign them to a physiotherapist in the practice who, on that particular day, has the least appointments so far. There will also be an option for a new-comer to select a physiotherapist of their choice should they wish to. For a returning patient, the appointment will automatically be booked with the physiotherapist that they saw in their last appointment, unless they choose otherwise. Once the date and time has been chosen, the customer will proceed, as described above, to the credit card page. Once an appointment has been successfully booked, and added to the physiotherapist's diary, an email will need to be sent to the customer, confirming the appointment date and time.

It has been decided that because of the need for secure credit card processing, it would not be wise for our team to develop such a system, and so the intent is to redirect to a third-party credit card processing company[21]. This company would be responsible for carrying out the transaction.

A function that the system will have to provide for individual physiotherapists will be the ability to add appointments to their diaries. This means that if a physiotherapist was to receive a telephone booking, there would be no possibility of that booking being double-booked by another booking received from this system.

In order to speed the booking process for customers, a cookie[3] may be stored on their computer with information like their username[23] (for logging in) and possibly the last practice they attended.

Statistics:

There may be certain facts about the system that different users of the system may want to work out. An example of such a statistic is “how many practices are there registered for a particular area?” This kind of query[18] could be used by the owners of the system, but equally, individual physiotherapist practices may want to look up information specific to their practice, for example, their sphere of influence[20]. Such abilities for querying the database will have to be inbuilt into the system, and the types of queries available to different users will be different, according to their level of access in the system. For example, the Webmaster[24] will have a lot more privileges[15] than a physiotherapist administrator.

The System:

Diagram 1 below shows an extreme machine[6] which represents the overall system. The areas of the system are further defined after the diagram.

Main XSM for Fizzilink APRABS Version 2.1

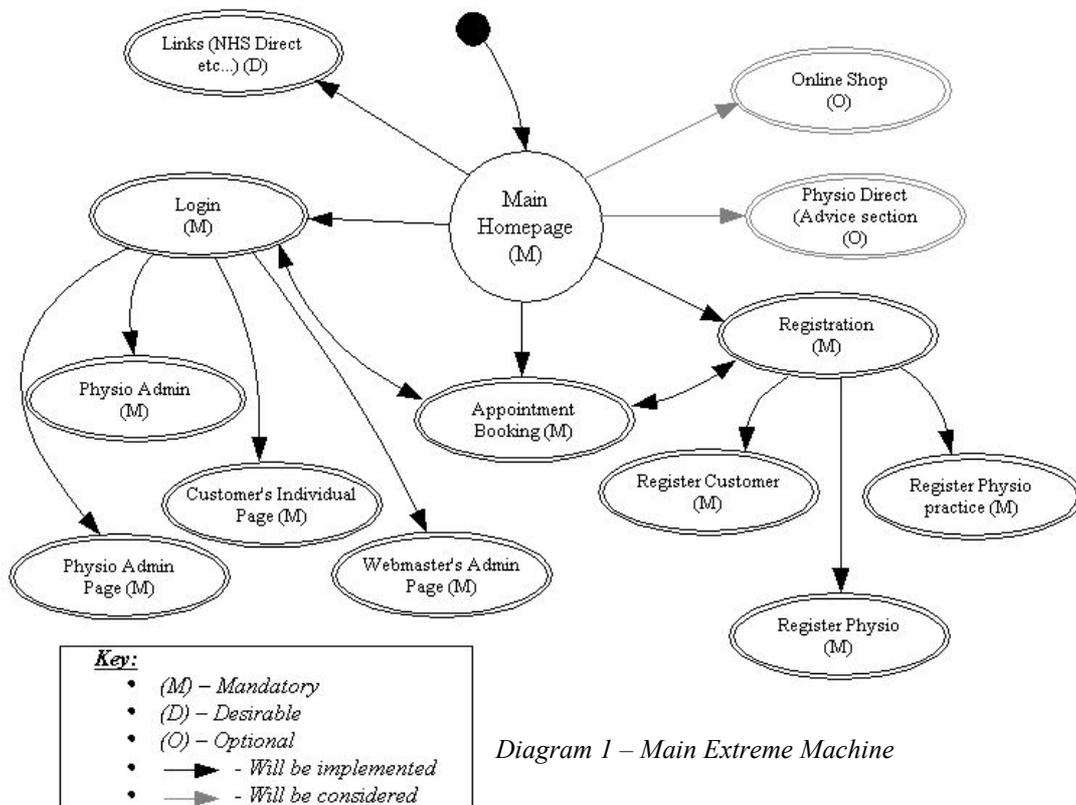


Diagram 1 – Main Extreme Machine

- The Physiotherapist's Individual Profile Pages are the pages where a practice administrator would be able to add the profile(s) of members of the practice.
- Login is an area where any registered user of the system would be able to log in, and, depending on their privileges, they would be directed to different areas of the system.
- Physio Admin is the page where a designated administrator of a practice would be able to add / edit and delete information regarding physiotherapists who work at that practice.
- Appointment Booking is the area of the system where a customer would be able to book their appointments with a physiotherapist, as described in more detail above.
- Registration is the area of the system that would allow either a customer to enter their details into the database, or where a physiotherapist administrator would be able to register their practice.
- Links will be an area where anyone who visits the web page will be able to find other web sites that may be of use to them. These links will be stored in a database, and will be updateable by the webmaster.
- The areas in grey represent areas of the system that are not likely to be implemented in this project, but, areas that will be considered.
- In the *key*, 'Mandatory' denotes an area of the system which will have to be implemented for the system to function minimally. 'Desirable' areas are the parts of the system that will heavily increase the functionality of the system, and 'Optional' areas are those which, if not implemented will not heavily affect the functionality of the system, but are areas that need to be considered if the system is to be updated at a future date. These areas are further explained in the *Functional Requirements* section of this document.

Elementary Data Modelling:

So far, the all areas of the system have been mentioned, but their descriptions of how they handle data have been very sparse. This next section of the document aims to describe in further detail, specifically, those areas of the system where data will be stored. Firstly, we will start with users.

Customer:

During the registration process, the customer will have to enter details about themselves. The unique identifier for a customer will be the username they choose. The information to be stored about the customer is:

- Name
- Full Address
- Telephone numbers (Home, Work, Mobile)
- Email Address
- Date of Birth
- GP Details (Name, Surgery Name)
- Referral source

Physiotherapy Practice:

When a practice is registered with the service, there will be certain information that will need to be stored about the practice, separate to the information stored about the physiotherapists. The identifying key[11] in this data will be the username of the administrator of that practice. The information required for the practices is:

- Practice name
- Full Address
- Telephone / Fax numbers
- Email Address
- Username / name of administrator of practice

Physiotherapist:

An important thing to consider when talking about the data required for a physiotherapist is the fact that it must be recognised that a physiotherapist must not be tied to one single practice. They must be able to work in more than one practice. The identifier in the table of registered physiotherapists will be a unique number that all physiotherapists are assigned when they become physiotherapists. This number is their CSP[4] number. On some of the CSP numbers, they will begin with a letter, so the registration part of the website will have to explicitly explain that the letter is not required. Data that needs to be stored about physiotherapists is as follows:

- Name
- Contact Address
- Contact Telephone number
- Email address
- D.O.B
- CSP number
- Working diary
- Any specialist knowledge

Webmaster:

This particular user will simply have to have a username and password stored, with the username being the identifier. From the username, the system will know when they log in, which privileges they have as a user.

There are many fields above for all the different users that are very similar, and so we thought it necessary to create another table, called 'User' in which we would be able to store all the shared information about the users of the system. This information is listed below:

- Username
- Password
- Full name
- Full Address
- Usertype (Defines the privileges of the user)
- Email address
- Sex

The other areas of the system that require data storage, but are not directly related to any users of the system are 'Appointments' and 'Availability'. These are defined further below.

Appointments:

The point of this part of the system is to store all the appointments for all the physiotherapists registered with the system. Each time a user makes an appointment, a new row will be added to the table. The identifier for this table is a system-generated number. The information stored is as follows:

- Physiotherapist identification number
- Practice
- Customer
- Area of the body the appointment is associated with
- The start date and time of the appointment
- And the duration of the appointment

Availability:

This table is the area that allows a physiotherapist to input into the system the times that he is working, and at what practice he will be working at. The identifier for this table is a combination of the physiotherapist's identification number, and the practice. The data that this table stores, is as follows:

- Physiotherapist identification number
- Practice
- Date
- Start time
- End time

User Characteristics:

There are four different types of user that have been identified for this system. These are:

- Customer – the person who wants to book an appointment with a physiotherapist over the Internet.
- Practice Administrator – the person responsible for registering the practice, and keeping the profiles of physiotherapists up to date. This user may also edit the diaries of the physiotherapists registered with that practice.
- Physiotherapist – this user has access to his own diary, and possibly his own profile, but may not access other people's profiles, or be able to delete his own.
- Webmaster – this user will have access to all areas of the system, including the databases. This user will be able to find out statistical information about the system, change some features of the system, and be able to maintain other areas of the system.

For all the users, we will assume that they will be competent working with the Internet, and will assume that, particularly for the user 'Customer', that they will have had some previous experience of purchasing on-line[14]. We are not assuming that the users of the systems will be experts, and so we are going to have to provide a system that is straightforward to use, and consistent. We will also have to make sure that there will be suitable documentation for the system, and suitable help tips on each individual page that the user sees.

Functional Requirements:

Listed below are the functional requirements of the system. The rightmost cells in the tables denote the importance each requirement is for implementation. The following define those measures of importance:

M, for a mandatory requirement (something the system must do).

D, for a desirable requirement (something the system preferably should do).

O, for an optional requirement (something the system may do).

The requirements are grouped by user type.

Customer

Req. ID	Requirement	
1	Register a new user	M
2	Login to system (if user is registered)	M
3	Search for practices/physios	M
4	Book an appointment with a physio	M
5	Access Links page	D
6	Access Online Symptoms Database	D
7	Access Online Shop	O

Practice Administrator

Req. ID	Requirement	
8	Add Physio Profile (physio must be registered first)	M
9	Edit Physio Profile	M
10	Delete Physio Profile	M
11	Register Practice	M
12	Edit Practice Profile	M
13	Delete Practice Profile	M
14	View Diaries	M
15	Edit Diary	M
16	View Statistics	O

Physio

Req. ID	Requirement	
17	Register (create new user)	M
18	Edit Profile	M
19	Delete Profile	M
20	View Diary	M
21	Edit Diary	M

Webmaster

Req. ID	Requirement	
22	Edit Links page	D
23	Edit Users	M
24	Delete Users	M
25	Add News Items	O
26	Edit News Items	O
27	Delete News Items	O
28	Edit Physio Profiles	M
29	Edit Practice Profiles	M
30	Delete Physio Profiles	M
31	Delete Practice Profiles	M
32	View Statistics	D

Hardware Requirements

Req. ID	Requirement	
33	Dedicated web server running Windows Server with ASP.NET.	M
34	Web server with MySQL support	D
35	SQL Database	M
36	Users of system need internet access on computer with javascript installed.	M

Security issues

Req. ID	Requirement	
37	Only registered users may book appointments	M
38	Only registered physios who are part of a practice may take bookings	M
39	Users need to log in using a username and a password in order to access restricted areas of the site.	M

Concurrency Issues

Req. ID	Requirement	
40	System should allow users to access the system at the same time, independent of each other.	M
41	Two users should not be able to edit the same information at the same time (ie practice administrator and physio should not be able to edit a physio profile simultaneously)	M

Concurrency Issues

Req. ID	Requirement	
42	Online help system will be available.	M
43	“Tooltips” and “pop-up” help on forms/buttons etc.	M

Non-functional Requirements:

In this section, the non-functional requirements of the system are detailed. A non-functional requirement either describes how well the system should perform (a quality attribute) or a constraint or limit that the system must adhere to (a resource attribute). The non-functional requirements have been split into the categories of reliability, usability, efficiency, maintainability and portability.

Reliability

44	The system should not allow invalid input from the user that would let to it crashing.
45	The system should have security features installed to protect the information stored about the users, so that they can not be accessed by any third party (ie hackers).

Usability *

46	User registration process should not take longer than 5 minutes.
47	Practice registration process should not take longer than 10 minutes.
48	Physio registration process should not take longer than 10 minutes.
49	A registered user should not have to log in anew each time he visits the website from the same computer, but should be requested for the password when he tries to enter a restricted area.
50	A registered user should be able to look up a physio and book an appointment within 5 minutes.
51	The website should be viewable on any computer with a screen resolution of at least 800x600.

Efficiency*

51	Any page on the website should load up within 30 seconds.
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- * (these figures depend largely on both the speed of the user-end internet connection, and the web host.)

Maintainability

52	The system should be easy to maintain through the use of legible and well thought-out code and structure. Also, the webmaster has access to administration pages for the website [22-32].
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Portability

53	The website should be viewable on any PC (running Windows or any other OS) or Macintosh that has a screen resolution of at least 800x600, which has a connection to the internet and a web browser installed that is capable of reading HTML, displaying pictures and running javascript[9].
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Dependencies and Assumptions:

For our system it is assumed from information gathered from the client that they were thinking of hosting the website on their own server, which it has been assumed would be running a windows operating system and also be running the Internet Information Services[8] (IIS), which is dependent on the operating system, and also a permanent Internet connection. This is because the client said they would prefer a Windows based system if they were to host it themselves.

If they don't host the website themselves then it has been assumed that the web hosting company that is going to be used will be a Windows based server host. Also it has been assumed that the web servers will be capable of running ASP.NET[2] web pages and also running a “mySQL”[13] database.

Also any practice registering with the Fizzilink community will also need to have an Internet connection so they are able to use all the services provided by the Fizzilink website. It has also been assumed that only patients with an Internet connection at home or have access to one will be able to use the system.

Another assumption is that the performance of the system will very much depend on the web host and the Internet connection or both the server and client.

Constraints:

The first proposition that was proposed was the use of php[16] CGI scripts along with ASP.NET[2] and JSP[10] all of which do a similar thing. JSP was rejected on the principle that no one in the group having any previous knowledge of the technology.

This just left the choice of implementation between php and ASP.NET, which two members of the group have experience of, but the choice came down to the fact that the client had requested that it was to be run on a windows based server. Therefore ASP.NET was chosen due to the performance qualities of it compared with php scripts.

To permanently store the data, both storing it in a Microsoft Access database and a mySQL database were considered. It was decided in the end to store the data using a mySQL database, due to it's open source and free availability. The database would then communicate with the ASP.NET pages via ODBC.

User Interface Characteristics:

All the users of the system will have experience with Windows applications, and will have used similar web pages before so it was felt sensible for the system to look and feel like a normal web based system. By this, we mean it is a webpages, icons, menus, links and pointers. This style reduces the time necessary to perform certain operations, and we know that the client would value this as they like patients to be able to book appointments as quickly as possible.

With this style, interactive objects such as buttons, list boxes and radio buttons are used to enable things to be done quicker. These are used in most web based applications so we have no doubt that the patients and physiotherapist who will use the system will understand how these types of object work.

In designing the user interface for our system, we shall try to follow these principles [Neilson]:

- Consistency, be consistent throughout the whole interface of the system so the user feels comfortable and able to use it. Simple and natural dialog – having no irrelevant information, using a natural and logical order.
- Provide shortcuts, so expert users can perform operations in a quicker time.
- Minimize user memory load – reduce the amount of information the user has to remember, by presenting it on the screen.
- Provide feedback, ask for conformation on irreversible actions like when making then booking for an appointment.
- Good error messages, written in plain friendly English such that it doesn't threaten the user so the user can understand them and provide some options to carry out to correct the situation.
- Clearly marked exits – allow the user to exit any part of the system and go back to a previous page, at any time.
- Prevent errors, stop them from occurring in the first place so then there is no need for good error messages as their won't be any errors.
- Simple and natural dialog, all relevant information should be written in natural good English and should follow a clear logical order.
- Speak the user's language, everything should be written in a way such that it is easy for the user to understand.
- Help and documentation, should be well written and easy to follow and understand.

Project Plan:

Below is a rough plan for the project for when different tasks should be completed by.

Task	Week												
	1	2	3	4	5	6	7	8	<i>Easter</i>	9	10	11	12
Initial Story Cards													
Requirements Document													
First Release of the System													
Second Release of System													
Final Release of System													
Develop Unit Tests													
Unit Testing													
Refactoring of Code													
Functional Testing													

Task	Week														
User Documentation															
Project Commentary															

Glossary of Terms:

- [1] Area – The area of the country, defined by county.
- [2] ASP.NET – A programming language specifically for webpages.
- [3] Cookie – A small file that will be stored on the computer of the person accessing the system. This file will contain a small amount of information, such as their username.
- [4] CSP – Chartered Society of Physiotherapists. The number given here is a unique number that all physiotherapists are given when they become fully qualified physiotherapists.
- [5] Database – Where all the information gathered by the system will be stored.
- [6] Extreme Machine – a diagrammatic representation of an area of the overall system.
- [7] Internet – The method by which all users will access all areas of the system. The Internet is a global network of computers connected together.
- [8] Internet Information Services – The protocol for hosting a webpage under a Microsoft Windows Server
- [9] Javascript – a simple language designed to help enhance webpages.
- [10] JSP – A programming language specifically for webpages.
- [11] Key – a unique identifier in a table.
- [12] Log in – When a registered user returns to the system, enters their user name and password, and is granted access to certain areas of the system.
- [13] mySQL – A Database language.
- [14] On-line – This refers to the fact that there is a connection to the Internet.
- [15] Permissions – The rules governing what different users are allowed to do in the system.
- [16] PHP – A programming language specifically for webpages
- [17] Practices – These are the places that the physiotherapists work.
- [18] Query – A message sent to the database asking it for specific information.
- [19] Secure Payments – This means that any information regarding credit card details etc will be encrypted before they are transmitted across the Internet.
- [20] Sphere of Influence – The area that the practice is attracting customers from.
- [21] Third-party credit card processing company – This is a company, not related in any way to the system that we are designing, but are paid to carry out credit card transactions securely.
- [22] Transaction – The action which means an amount of money is successfully taken from your bank account.
- [23] Username – This is a unique identifier that the user may choose when they register.
- [24] Webmaster – This user is the overall administrator of the system. He will have access to all areas of the system.

References:

- [Neilson] – Neilson, J., ‘Usability Engineering’, Academic Press, 1993.

Changes to Document 12/03/04:

1. Have added the requirement that the system must be able to allow a Practice Administrator to add a profile page for the practice, along with profile pages for the individual physiotherapists. (*Page 4 – Registration*)
2. The requirement that a patient no longer chooses their physiotherapist by default. (*Page 4 – Appointment Booking*)
3. Once an appointment is booked, an email will be sent only to the customer confirming the date, and time, rather than sending an email to the physiotherapist as well. (*Page 4 – Appointment Booking*)
4. The Main XXM for the system has been updated, showing more about how the system proceeds through its various areas. (*Page 5 – System*)
5. An explanation to the meaning of the key in the Main XXM diagram has been added. (*Page 4 – System*)
6. Rather than using either the CSP or the OCPPP numbers as the identifier when storing details about physiotherapists, the decision was taken to simply use only the CSP numbers, as all physiotherapists will have one of these numbers.