

# ANALYSIS

## 1. Introduction

A website, is a set of related web pages typically served from a single web domain. It is essentially a marketing tool that can make or break a business. It is like a massive brochure that can be updated and manipulated with ease. This is why almost every company out there has a website, because all potential customers can find out about you and any of your products at any time, and at any place that suits them. Thus, having a considerably large influence on people's lives because they can be accessed 24 hours a day 7 days a week, which keeps the business in the mind of the consumer. More than 3.4 billion people use the internet every day and over 90% of them have carried out transactions over the last 12 months. Again proving how vital a website can be to a business's success.

## 2. Description of Current system

Currently you can hire a wide variety of companies to build a website for you. Typically, it would cost around £600 to £1,200 to design a fully functioning small business website, as well as £900 to £2,000 to actually program the website. Then you have to think about the domain and hosting which usually costs around £0.99 to £100. After all this you would still usually have ongoing costs that are around £0 to £30 per month. So all in all you can expect to pay £1,000 to £4,000 for the total package. This is usually for small business websites, but if you wanted a small first website it can cost as low as £400. This is would be great if you were just starting a business. A first website is made up of between one and 10 pages and is great for start-ups or small businesses. I will be making a small business website, which is usually between 10-20 pages, has limited functionality and needs very few, if any, plugins. These types of website are suitable for those wishing to redesign or refresh a first website, or are ready to develop a dedicated online presence. It is also important to choose an option that allows you to upgrade and add to it in the future. This is therefore why I am choosing to build a small business website because it allows the most flexibility in terms of being able to upgrade it at a later date. It is also imperative to ensure that it is mobile responsive given that this is now where the majority of traffic originates from. There are many people out there that can make your website. Choices include;

- UK based agencies that can charge between £40 - £130 per hour. These are disciplined and reliable but potentially slower to respond to requests.
- Freelancer developers who can cost anywhere from £15 - £70 per hour depending on their experience. These are usually a more personalized service, but might lack the wide range of skills possessed by an agency.
- Off-shore options are usually the cheapest options at £5 - £20 per hour. This is definitely the cheapest option, but it is a lot less reliable than the other two options. Always be wary of offers that sound too good, or cheap to be true.

These prices depend on the size and complexity of your site, as well as the number of revisions and amends that are required.

Java is used in all types of websites. Java is more common for large websites because there is a greater need for complex server-side processing. A full Java installation, most likely isn't going to be available in many cheap web hosting setups because there is less free web hosting available for java, meaning that unless you have enough resources to host you own webserver you are most likely not going to choose Java. That is why other languages such as PHP are used in smaller environments. Another reason why Java is used because the client demands it. Some clients have 'accepted technology lists' and if you propose something different you have to give a good reason why and why something on the list couldn't be used. The main reason why Java is used over other languages, is the ability to find programmers and replace people who leave the project. Java is a statically typed language and is cheaper than other statically typed languages used for web development. Static typed languages are good for medium to big projects, complex domain rules and a lot of backend code, because you can organize better and IDEs help you to find errors in your code quicker.

Dynamically typed languages, like, Python, development will be much faster but testing will have to be done more thoroughly. Dynamically typed languages are suitable if you don't have much time or money and your requirements change very quickly. Django is a web framework in python, basically allowing you to develop web applications in python. Django has a massive community presence because it is open source and is built and kept updated by the developers who use it. Resulting in a framework that never lags behind and has lots of answers available when you have questions. It encourages quick development and forces clean and efficient code. Django also has very well organized documentation and on top of that all code is publicly made available on GitHub for use and help. It is a free open source software, and its primary aim being to ease development of complex and database driven websites. Django also has a built-in admin panel for CRUD tasks. Large websites such as; Instagram, Mozilla and Pinterest use Django as a back end. For all the reasons above I have decided to create my website using Django.

The hardest thing about having a booking software on your website is finding one that meets your needs and requirements. Any basic booking system should include the following basic features; a sensible managements system, – that can handle the bookings – a calendar, - that is synced to the rest of your website allowing you to keep track of bookings – and a user-friendly interface – seems obvious but people don't have a lot of patience to be struggling with an interface. There are many ways to get a booking system;

- Do it yourself. This is cheap, easy to setup and integrate, and more likely to use tools that are already familiar to users. However, it is going to have limited features and isn't going to scale up as required to handle increased traffic.
- Cloud / software-as-a-service. A good cloud will offer an open API which you could build onto, integrate mobile apps, site plugins, and third party systems. This is usually a more packaged based service which could cost more but can communicate with other relevant services. Also, you don't actually own the software and are therefore limited in the ability to customize core features.

Many Surgery websites use an external provider to handle bookings called System Online which has a range of online services to allow patients to proactively manage their care, also allowing them to book appointments and manage medication. These range of services can be integrated into a website, requires sophisticated programming therefore increasing the complexity of the build and the overall price of the build. This is a big problem for smaller surgery's as this can prove costly for the feature to be integrated into a website and the company itself charges you for using its service.

### 3. Identification of End Users:

The primary end users of this project are the patients of the surgery I am making the project for. The purpose of my project is to make a website that is user friendly and allows the users to make appointments quickly and easily. The software currently being used is mentioned above in the Description of Current System section. My project is to make a website for a general practice surgery based in the West Midlands. Its main feature is going to be an online booking system where patients can go online and book appointments with a chosen doctor. After speaking to a doctor from the surgery, I have found that they have recently received criticism from their patients claiming that their current system doesn't have enough information regarding health issues, the current booking feature is too difficult to navigate for some people, and patients are currently having difficulties with booking convenient appointments, because they are finding it tough to get through to the receptionists over the telephone in order to make the appointments. The doctors agreed that the current booking system causes some issues, because they use an external company, and therefore there can sometimes be discrepancies and mix-ups with some appointments.

As well as the patients, my project has another end user, the general practice staff. The website will be used by the doctors allowing them to view their appointments made, as well as allowing an admin to check the doctor's usage over a time period and therefore determine their availability. This functionality allows staff to check which doctor is busiest and which is quietest, thus determining peak times and quiet times. Therefore, providing a business and management feature as well as the main booking feature. The doctors also expressed their concern to me about the cost of hiring an external company to manage all bookings for them. The booking feature they currently use is described above in the Description of Current System section. The current system I have been told is too difficult to navigate and they have limited training on how to use it. They would prefer a booking system that would keep all bookings internal because it gives the general practice more ownership and control over their own system and gives them the flexibility to change the settings to settings that are more suitable to them. They would also be able to extract data for audits which is vital for improvement purposes. A booking system designed specifically for their practice would be specific and tailor made to the doctors and patients specific needs. I have therefore been asked to devise a solution.

### 4. Evidence of analysis:

To properly grasp a full understanding of the problem that my user was facing and the problem that I have been asked to solve, I decided to conduct an interview with them about it. During the interview, they really opened up about all the issues they were having and the impact this was having on them being able to safely conduct their practice. They also told me about the issues young doctors were facing today and the injustice that they were experiencing. They also gave me a healthy insight into the prolonged dispute with the government and how it could be overcome if the two parties were reasonable. The interview is shown below:

#### ***What are you having problems with at the moment?***

*Currently we are having massive issues with patients not being able to book convenient appointments for themselves because there are difficulties with getting through on the telephone to the receptionists in order to make the appointments. This is why we really require an online booking system so patients don't have to wait to try and get hold of someone over the phone, they can book an appointment at any time and any place they feel like. We are also currently experiencing issues with our current outhouse system*

*as it is becoming increasingly difficult to migrate our complex booking procedures and outsourcing to external companies is very expensive. Also, any issues or problems have to be solved through them and we have to get in touch with them if we need to access any control settings etc. This is a massive pain and headache and if we had our own system none of this would be necessary. We currently don't get any data on appointment traffic, so we are therefore limited on how to improve our services. This would be an extremely useful feature to have as it would save us both time and money. There is almost no communication between us, the doctors and the patients outside of our offices. This makes it very hard to improve our practice and could be improved if we had some sort of feedback system.*

### **How do these problems affect your work?**

*These problems make it extremely difficult to try and tailor our time and appointments to the patient's specific needs. This can also have a knock-on effect as it can make the patient – doctor relationship very difficult because the patient could be very dissatisfied with the practice but because there is not feedback procedure in place, there is no form of communication channel available discreetly. The technical issues are very time consuming and in order to resolve most technical issues it requires going out of house, this distracts where our time should be focused on the patient and how we can better their experience. Having no data on trends and no data on the analysis of appointments, makes it very hard to make improvements to our practice and improve our services. This I believe is vital, in order to successfully conduct our practice at a satisfactory level. Overall these are all issues which ultimately affect the patient journey and the experience they have with us, and these issues should be at the forefront of your solution.*

### **Is there anything you don't like about the current software you use?**

*The current software is very difficult to use and navigate because we are given limited training on how to use it and how to fix any issues we may have. There is also currently no analysis or data regarding our practice. This creates massive limitations on how we can improve our practice and services.*

### **Is there anything specific you would like this program to do?**

*Ideally the program would have the following features:*

- *The website will be extremely easy to use and navigate.*
- *An in house booking feature to give more ownership and control to us*
- *Will be able to extract data for audits*
- *Whole website will be specific and tailor made to our and our patients needs*
- *Greater flexibility to change settings.*
- *Feedback feature to create a communication channel between the patients and the doctors.*

## **5. User Needs:**

- A fully functioning website that has an internal booking feature that uses no external provider or software.
- The booking feature must be easy to use for both users and staff, and must be a free service for the patients and have no running costs.
- The website must have basic information about the surgery itself and information regarding common health issues.
- Have a feedback feature where users can give feedback to doctors.

- Have a login feature built into the website which can distinguish between doctors, super users, and patients.
- Have a register function built into website allowing new users to register.
- The login feature leads to a unique user profile page that differs from account to account.
- Allow the user to save and update a profile which has information regarding themselves.
- Process all the booking data and output statistics about each doctor's usage.
- Have a feature where doctors can send the patient information regarding their prescription, built into the website rather than use an external email feature.

## 6. Data Sources and Destinations:

The main data source for my program is the programs database. You could consider the users themselves being the main data source as they provide all the relevant information that is then stored into the programs database. The program will extract any data that is relevant to the user's requests from the database. My program will be storing all the data locally in the program during runtime in the form of browser sessions, which will be filled with the results of any queries that the user makes.

## 7. Objectives

- I. Have a fully functioning website that has general information regarding:
  - a. The surgery itself
  - b. Common health issues.
- II. Allow users/patients to make bookings from a range of different:
  - a. Days
  - b. Times
  - c. Doctors
- III. Validate all booking made, so that;
  - a. You can't book an appointment that is already booked
  - b. You can't book an appointment in the past
  - c. You can't book an appointment more than three months in advance
- IV. Have a login feature to allow users to;
  - a. Access a unique profile page
  - b. Make changes to this profile
  - c. Book appointments
  - d. Create feedback
  - e. Logout
- V. The login feature should be validated so;
  - a. Only valid details will allow a user log in, if incorrect details are entered the user will be told to enter new details
- VI. Have a register feature so new users can register to use the extra services.
- VII. The register feature should be validated so;
  - a. Only valid email addresses are accepted
  - b. Making sure all fields have been entered with data
- VIII. Have a feedback feature:
  - a. So, patients can give constructive feedback to the surgery.
  - b. Staff can view all feedback received.

- IX. Have a profile feature where users can;
  - a. Create a unique profile containing information regarding themselves
  - b. User must only be able to make one profile
  - c. Should display all of users details in a well-structured manner
  - d. Edit any information regarding their profile
  - e. Any information that has been edited should be updated in the database
- X. All the feature listed below must only be able accessible to users that are authenticated and registered to the website.
  - a. Booking
  - b. Feedback
  - c. Profile
- XI. The website should be authenticated in such a way that it can differentiate between
  - a. Staff
  - b. Admin Staff
  - c. Regular users.
- XII. Process the information regarding the bookings to calculate
  - a. The percentage of booked appointments over a month
  - b. Give recommendations on;
    - a. Whether doctor should be part time, full time or let off
    - b. What days the doctor should take off, which days should be half days and which should be full days
    - c. On the half days, what period should the doctor take off
  - c. Separated into days of the week. From this for each day (Monday, Tuesday etc) calculate;
    - a. Doctor peak times
    - b. Doctor quiet times

## 8. Proposed Solution

I am going to create a custom website that allows users to make appointments with their chosen doctors at their chosen time and date. The user will only be allowed to make appointments that are not already booked. The website will also include general information regarding the surgery itself and common health issues for the users to browse through. It will also have a personalized profile page where the user can enter key information about themselves to help the doctors deliver them the best care possible. My website will also allow patients to submit constructive feedback to the surgery to help the surgery improve its facilities where possible. There will also be a prescription feature which will allow doctors to send information regarding the patient's subscription to the patients so the patient can see what medicine to use and when, and most importantly guidance on how to use the medicine. A big part of my program will be the login feature which will ultimately only allow authenticated users to access the features listed above. There will also be different levels of authentication and permissions that will allow admin staff members to access all features whereas, normal staff members will be restricted. There will be a clear distinction between patients, staff members and admin staff. My program will hopefully be able to process information about the bookings, thus, allowing my program to calculate individual doctor availability, quiet and peak times. This feature has been specified as an acceptable limitation.