**A picture containing text

Description automatically generated**

**School of Computing and Mathematical Sciences**

**CO7201 Individual Project**

**Preliminary Report**

**AN AUTOMATED SYSTEM FOR LOCAL GPS**

**[SHREEYA DINESH DESAI]**

**[sdd13@student.le.ac.uk]**

**[Your student ID]**

**Project Supervisor: [DR.YAKUN JU]**

**Principal Marker: [DR.STANLEY FUNG]**

**Word Count: [XXXX]**

**[Submission Date]**

**DECLARATION**

All sentences or passages quoted in this report, or computer code of any form whatsoever used and/or submitted at any stages, which are taken from other people’s work have been specifically acknowledged by clear citation of the source, specifying author, work, date and page(s). Any part of my own written work, or software coding, which is substantially based upon other people’s work, is duly accompanied by clear citation of the source, specifying author, work, date and page(s). I understand that failure to do this amounts to plagiarism and will be considered grounds for failure in this module and the degree examination as a whole.

Name: [Shreeya Dinesh Desai]

Date: [Date of submission]

Contents

[**1.** **Aims and Objectives** 3](#_Toc191146499)

[**1.1** **Challenges** 3](#_Toc191146500)

[**2.** **Requirements** 3](#_Toc191146501)

[**2.1** **Essential** 3](#_Toc191146502)

[**2.2** **Recommended** 4](#_Toc191146503)

[**2.3 Optional** 4](#_Toc191146504)

[**3.** **Technical Specification** 4](#_Toc191146505)

[**4.** **Requirements Evaluation Plan** 5](#_Toc191146506)

[**4.1 Evaluation Criteria** 5](#_Toc191146507)

[**4.2 Testing Method** 5](#_Toc191146508)

[**5.** **Background Research and Reading list** 6](#_Toc191146509)

[**5.1** **Examples of Existing Web Applications.** 6](#_Toc191146510)

[**5.2 Articles** 6](#_Toc191146511)

[**5.3** **Reading List** 6](#_Toc191146512)

[**6** **Time-plan and Risk Plan** 8](#_Toc191146513)

[**6.1 Time plan** 8](#_Toc191146514)

[**6.2 Risk Plan** 9](#_Toc191146515)

[**7** **References** 9](#_Toc191146516)

# **Aims and Objectives**

United Kingdom is the sixth largest economical country across the globe (GDP of United Kingdom, 2024), and yet it is facing healthcare crises. Few of the major reasons that contribute to downfall of the healthcare sector within the UK are lack of staff, an aging population, burnout of existing staff and over population. On the 2nd of October 2024 a report published by BBC News stated that, the cities that had most patient per GP were Thurrock, Leicester, Blackburn with Darwen’s, Luton and Melton Keynes and Portsmouth (Nick Triggle & Wesley Stephenson, 2024).

While this is just a broad overview of the healthcare sector, the ground reality is far more disturbing. Patients are not able to receive proper treatment due to reasons zero knowledge about availability of doctors or nurses, no information regarding minor injuries, never-ending appointment forms and, sometimes not even able to secure one appointment.

Inorder to address these issues, the aim of this project is to design/develop An Automated System for Local GPs, which will be helpful for both healthcare staff and Patients. The Web app would be developed considering objectives such as data security, less time-consuming processes and user-friendly UI. These objectives will cater the need of both healthcare staff and Patients by allowing staff to set availability prior then a month, retrieve medical history of patients with ease and provide prescriptions while maintaining medical records. On contrary, the patients will be able to manage/ view prescriptions, for minor injuries they could leverage informative articles and free one-to-one chat feature available on the Web App. This project will allow the patients to access the GP on-demand without waiting for weeks or months and this will also optimize the workload for the staff.

# **Challenges**

* Security of the web application due to data confidentiality.
* User friendly Designs, without much re-routing.
* Easy appointment scheduling without much hassle.
* One-to-One Chat feature for GP and Patients.
* Payment integration.
* Cloud Deployment.

# **Requirements**

# **Essential**

* **Registration:** The patient will be able to register to the webapp using secure login credentials, allowing them to add/upload their previous medical history. Registration of Doctors and Nurses will be performed by Admin.
* **Availability:** The Doctor and Nurses will be allowed to set their availability prior to a month.
* **Book appointment:** As per the need of patients they can book the appointment with the available Doctor/Nurse.
* **Provide prescription:** The Doctor will be able to access medical history of patients and provide a digital prescription on the web app.
* **Admin Dashboard:** The dashboard will help to add/delete patients, add/delete doctors, add/delete nurses and scheduling the bookings for senior citizens.
* **Staff Dashboard:** The Dashboard will help staff to set their availability, view booked appointments, provide prescriptions, view patients medical history and send prescription to pharmacy.
* **Patient Dashboard:** The Dashboard will show the Doctor/Nurse Availability, book appointment, view prescriptions, upload the prior medical history, previous booked appointments records.

# **Recommended**

* **Deployment on the cloud**
* **Articles for minor injuries & awareness:** Inorder to tackle mild external injuries, Articles will be provided inorder to take safety measures at home which will reduce some staff workload.
* **View prescription:** The patient will be able to view the prescription provided by the Doctor/Nurse online.
* **Buy and Pay prescriptions:** For the prescribed medicine the patient can buy and pay for the prescription either online or offline.

# **2.3 Optional**

* **One to one chat:** Due shortage of Doctor/Nurse, if in case there's a follow-up required for a specific patient, or a patient requires immediate attention the chat feature can be leveraged.
* **Responsive Web Application.**
* **Video Consultation**

# **Technical Specification**

|  |  |
| --- | --- |
| **Component** | **Name** |
| Database | MongoDB/ SQL |
| Backend | Python, Flask |
| Frontend | React JS, HTML, CSS, JS |
| API | REST |
| Authentication | JWT/OAuth |
| Cloud Deployment | AWS / Azure |
| Version control | Git, GitLab |
| IDE | Visual Studio Code |
| Testing | Manual testing, User Feedback(frontend), Unit testing, Postman (API) |
| Designing | Figma, Sketch (paper & pen), Draw.io |
| Documentation | MS Word |
| Operating System | Windows |

# **Requirements Evaluation Plan**

# **4.1. Evaluation Criteria**

* Functionality: Features such as User authentication, prescription management and appointment booking are the essential aspects of this project, which should be fully functional.
* Usability: The User Interface, navigation and accessibility needs to be tested through user testing, especially considering elderly people.
* Security: Testing should be carried out to test that there is no data leakage and medical records are handled safely.
* Scalability: The Web app should be able to handle multiple user simultaneously, while maintaining the same responsiveness.

# **4.2. Testing Method**

* Unit Testing: Each component should be tested individually.
* Integration Testing: Test how well frontend, backend and database work together.
* User Acceptance Testing: Test the application with end users like elderly people and Doctors.

# **Background Research and Reading list**

# **Examples of Existing Web Applications.**

1. <https://highfieldsurgerysevernstreet.co.uk/>

The provided website for a GP serves all the necessary services, however, lacks the fundamental of website development, which would be the User Interface. The very first step to consider before building the UI is to identify the key users. Considering UK’s current demographics, a lot of the users of healthcare services are elder people. Providing a lot of information such as news, options to book self-service would seem bit overwhelming to the elderly people.

1. <https://www.regentstreetclinic.co.uk/>

Similarly, this website has a load of pop-ups, and the UI is very much complex to understand from end user perspective. The major drawback seems to be in the appointment booking, as this application asks for up-front payment.

1. <https://www.leicester-holistic-gp.co.uk/>

The website has a very bad user experience, for booking an appointment the form behaves weird, no-proper colours used and less interactive.

# **5.2 Articles**

1. <https://www.nuffieldtrust.org.uk/news-item/general-practice-on-the-brink-what-should-reform-look-like>

The blog post written by Dr Rebecca Rosen that was published on 17th May 2022, tells about the solution for the problems that were faced by the Patient and GP such as the major four fundamentals functions that GP must be able to cover, appointment scheduling for minor problems and acute problems and use of digital technologies.

1. <https://www.bma.org.uk/news-and-opinion/the-growing-crisis-in-general-practice-a-call-to-save-our-surgeries#:~:text=A%20crisis%20in%20General%20Practice,load%2C%20the%20pressure%20is%20immense>

The article that was published on Tuesday 15 October 2024, informs about the crises that were being faced by the GP and administration work.

# **Reading List**

1. <https://www.researchgate.net/publication/387460992_Software_Testing_Techniques_and_Levels_in_Software_Development>

The publication tells us that when exactly to start with the testing, types of the testing software such as manual testing, automated testing, white box testing, black box testing , grey box testing, load testing and stress testing. However, it also mentions about the levels of the software testing that is unit testing, integration testing, system testing and validation testing.

1. <https://www.geeksforgeeks.org/types-of-software-architecture-patterns/#what-is-software-architect>

This publication talks about the software architecture patterns that are been used in real world, where in this project the Micro-Service architecture will be used.

1. <https://www.geeksforgeeks.org/microservices/>

# **Time-plan and Risk Plan**

## **6.1 Time plan**



# **6.2 Risk Plan**

|  |  |  |
| --- | --- | --- |
| **Risk** | **Impact** | **Mitigations** |
| Data Privacy | High | Secure the login using JWT. |
| Integration Service | High | Perform API testing at earliest stage. |
| Cloud Deployment | High | Plan early deployment inorder to mitigate upcoming issue. |
| Payment Integration | High | Troubleshoot any integration issue. |

# **References**

*GDP of United Kingdom*. (2024, November 16). Retrieved from Statistics Times: https://statisticstimes.com/economy/country/uk-gdp.php

Nick Triggle, & Wesley Stephenson. (2024, October 02). *The places with the worst GP shortages revealed*. Retrieved from BBC NEWS: https://www.bbc.co.uk/news/articles/cjd51y9vn9do