Early Cancer Detection & Health Monitoring System
Project Plan

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Introduction

Colorectal cancer (CRC) is one of the most common types of cancers, affecting more than 40000 people in the UK every year. [1] It is critical that patients who have undergone treatment continue to monitor their health in order to detect recurrences early. However, the delivery of adequate follow-up programmes and arrangement of regular visits and appointments can prove to be very difficult as a large number of patients live in remote or rural areas, far away from hospitals and medical facilities. An accessible mobile application will assist patients in actively engaging in the follow-up programmes and receiving feedback on their health status, as well as reminding patients to perform self-checks and send the information to a health specialist at regular intervals. Such a system will allow for remote screening, diagnosis and detection of any recurrences that occur between visits, at the same time reducing a considerable amount of time spent on travelling and expenses both for the patient and the healthcare provider.

Goals

The main goal of this project is to create an accessible e-health tool to help those previously treated for CRC to easily monitor and self-check their health status for recurrent or new symptoms. The system will enable patients to communicate this information remotely and directly to a health professional, through the generation of summaries and reports of patient's data, adapted to the level of medical expertise and psychological features of the reader, as well as from previous versions of reports. Another critical goal of the project is to handle and store all patient data securely, as it is very sensitive to the user and critical to the analysis and generation of accurate and informative reports that show the evolution of changes or new symptoms which appear over time. The system will bring numerous benefits over traditional procedures for follow-up visits, allowing for early diagnosis of recurrences and treatments.

Methodology

An agile software development methodology will be followed for this project, in order to develop the web application and report generation software. The activities are outlined below:

- Developing the plan for the project and understanding the research problem
- Reviewing literature about related current research and existing systems

- Comprehending related work (similar medical applications, natural language processing and generation, machine learning, usability and accessibility of user interfaces etc.)
- Learning about relevant uses of new technologies, programming languages and tools
- Conducting user research through surveys and interviews with doctors (if ethical approval is received) and volunteer pretend patients
- Creating the requirements specification document
- Designing the system architecture and database
- Implementing prototypes for each stage of the development process
- Developing the system and implementing the functionalities to meet the requirements specification
- Designing a responsive and accessible user interface
- Evaluating, testing and debugging the system and the final deliverables of the project
- Writing the documentation, report, user manual and maintenance manual

Extra features: additional functionalities, user interface enhancement etc.

Resources Required

The resources essential to the successful delivery of the project include:

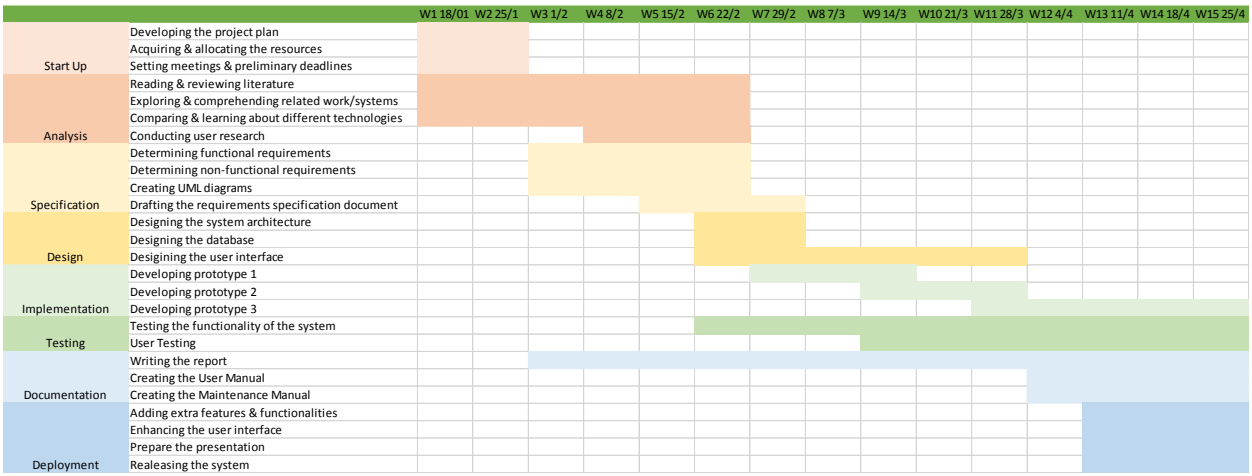
- Hardware: PC/Laptop and tablet/mobile device with internet connection
- Software: programming environment, means of communication with the research and medical team, as well as a variety of other tools and applications to design the user interface, perform regular backups and releases and conduct user research and evaluations.

Risk Assessment

Risk	**Mitigation**	**Level**
Time delays caused by workload/illness/unavailability of third parties to take part in knowledge acquisition and user research (e.g. medical staff) etc.	• Following the project plan and working to schedule • Dividing the project into several achievable milestones which can be worked towards incrementally using an agile development methodology • Testing throughout the entire project to catch mistakes early and avoid extra workload	Low
Technology breakdown and security of assets caused by Damage/Loss of physical and electronic copies of work and project information due to	• Physically securing PCs, laptops and project information • Allowing only authorised users to access data about the project • Performing regular backups of the different versions and phases of the	Low

computer system failures, theft or unauthorized access to information	system • Storing the information on multiple secure devices and locations	

Timetable



		W1 18/01	W2 25/1	W3 1/2	W4 8/2	W5 15/2	W6 22/2	W7 29/2	W8 7/3	W9 14/3	W10 21/3	W11 28/3	W12 4/4	W13 11/4	W14 18/4	W15 25/4
Start Up	Developing the project plan															
	Acquiring & allocating the resources															
	Setting meetings & preliminary deadlines															
Analysis	Reading & reviewing literature															
	Exploring & comprehending related work/systems															
	Comparing & learning about different technologies															
	Conducting user research															
Specification	Determining functional requirements															
	Determining non-functional requirements															
	Creating UML diagrams															
	Drafting the requirements specification document															
Design	Designing the system architecture															
	Designing the database															
	Desigining the user interface															
Implementation	Developing prototype 1															
	Developing prototype 2															
	Developing prototype 3															
Testing	Testing the functionality of the system															
	User Testing															
Documentation	Writing the report															
	Creating the User Manual															
	Creating the Maintenance Manual															
Deployment	Adding extra features & functionalities															
	Enhancing the user interface															
	Prepare the presentation															
	Realeasing the system															

References

[1] Nhs.uk, (2016). *Bowel cancer - NHS Choices*. [online] Available at: http://www.nhs.uk/conditions/cancer-of-the-colon-rectum-or-bowel/pages/introduction.aspx [Accessed 24 Jan. 2016].