Initial Project Plan

Health Tracking Application

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Project Description:

A chronic medical condition is a persisting condition which is usually described as lasting over 3 months. These conditions often need to be tracked to give the patients knowledge about their symptoms. Levels which would be considered as normal will change from person to person depending on different factors, therefore understanding about their condition is a necessity. This understanding enables patients to look out for when their data deviates from their own normal levels instead of someone else's. (*Bernell and Howard, 2016*)

By tracking their own data, it solves this problem. It gives them the ability to see their trends to find their own normal levels. And what other factors may affect these levels, by comparing datasets.

An obvious example of this would be a patient with type 1 diabetes finding it useful to be able to track how their blood glucose levels relate to their food intake and activity levels.

This can be extended by tracking qualitative data along with the quantitative. By the patient understanding how their condition effects their moods or motivation, allows them to track changes and patterns more easily. It gives them the ability to see how different factors change not only the numbers they record, but also their emotions.

This also makes the transfer of knowledge between patient and doctor easier. The doctor's knowledge is not limited to the tests they can run at the appointment, but also readings which have been taken over the previous few weeks. This leads to more effective treatment of the patient.

A technical solution to this problem will be a health tracking application. It will have fields to record qualitative and quantitative data and the ability to add new fields if not already provided. The data input will be displayed in graphs to enable patients to track their condition, symptoms and treatments over time. The application will firstly set up a profile page for the user to be able to add details about themselves such as medications, height, weight, age, etc. This can be used to add context to the data. As a medical professional will need to see a different set of data, there would also be a separate area showing specific graphs and raw data for clinicians.

However, this application poses multiple problems in terms of storage of data. As the data will be sensitive, privacy is a concern. The database and application will be secure to ensure personal data is not shown to other users or people spying on the network. The user will have to be reassured of this to make them feel comfortable using the application.

Along with the data being secure, interoperability with other applications will be a problem in the future. (*SMART Health IT, 2018*) By making the application to the standards that are in place currently, it enables it to link in with existing programs, and improve the maintainability of the codebase in the future. (*HI7.org, 2018*)

HI7.org. (2018). *Overview-dev - FHIR v3.0.1*. [online] Available at: http://www.hI7.org/implement/standards/fhir/overview-dev.html [Accessed 2 Feb. 2018].

SMART Health IT. (2018). *Why Use SMART*?. [online] Available at: https://smarthealthit.org/an-app-platform-for-healthcare/why-use-smart/ [Accessed 2 Feb. 2018].

Bernell, S. and Howard, S. (2016). Use Your Words Carefully: What Is a Chronic Disease?. *Frontiers in Public Health*, 4.

Project Aims and Objectives

Due to the large scope of the application, by focussing on one medical condition, but making it extensible to others, will allow me to keep development to the time frame of 15 weeks. I will do this by choosing a subset of data entries and graphs related to one condition to create and display. This can be extended for a more general application in the future.

Essential Objectives

- The Application will be developed on an appropriate platform, which takes into account the ease of use of the system.
- The data that is input needs to be stored securely in a database and must comply to the current standards.
- The application will be able to store profile information for the user.
- For the specific chronic condition, the user should have set related fields for the user to upload data.
- The user should also be able to create more fields if the above set is not sufficient for their use.
- The data which is input should be displayed in useful concise graphs for the user to track their data over time.
- The application needs a healthcare professional area, showing raw data and graphs, which are useful to medical practitioners and specific to the patient.
- Usability testing to ensure the application is easy and simple to use with the correct functionality.

Additional Project Objectives

- The system will ideally be able to compare different datasets in graph formats. For example, being able to compare and overlay the weight graph and
- Data mining to discover normal levels for the patient will enable the system to alert the user when data isn't at an abnormal level and there may be cause for concern.

Testing

The application will have to undergo testing in terms of security, functionality and usability.

By security testing, I will test that the data that is stored in the database is secure.

Functionality and Usability testing will focus on user centred testing. This will be carried out on volunteers, who may or may not have the chosen chronic condition, to test the application and give feedback on the design, usability and functionality.

Ethics

As the data that's used for usability testing will be dummy data, and there is no real patient data being used, there is no need to undertake ethical training.

Work Plan

A breakdown of the tasks can be found here with a general time allocation. A more detailed week by week plan can be found in the appendices in the form of a Gantt chart.

Milestones

- Supervisor Review 1 Application requirements have been finalised.
- Supervisor Review 2 Project preparations have finished, implementation can begin
- Supervisor Review 3 Implementation has been finished, user testing can begin.
- No further development on application Evaluation and report can be written.

Week 1:

- Write Initial Plan
 - \circ ~ Compile Project Aims and Objectives
 - o Create Work Plan

Week 2:

- Chronic Condition Research
 - Choose a condition to focus the application on
 - Research into chosen condition
 - Find what data users would want to store about specific condition
 - o Find what graphs would be useful to both health professionals and users
 - Write up research of background and justifications for choosing chronic condition.
- Gather Project Research
 - Research other solutions that are available
 - Analyse coverage of functionality
- Find Requirements
 - Gather requirements from research into previous solutions, from medical professionals and chronic illness research.
 - Decide platform of application.
 - Finalise Requirements with supervisor.

Week 3:

- Write up Requirements and justifications for final report.
- Write up justifications for platform.
- Research and choose available technologies
 - Database Technologies
 - Backend Technologies
 - Frontend Technologies
 - Graphs
 - Security research
 - Finalise with supervisor
 - Write up research and justifications of technologies
- Milestone: Supervisor Review 1

Week 4:

- Design a User Interface
 - Use Cases
 - o UML
 - Wire Frames of UI
 - Finalise with supervisor
 - Write up the designing of the application.

• Milestone: Supervisor Review 2

Week 4 - 9:

This time will be for implementing the software using my chosen technologies and other preparations. As I implement the application, I will also be writing unit tests after each section is completed.

During week 9 I will be carrying out user tests on the software, and implementing final changes to the system if there's time.

Implementation Tasks

- Basic profile
- Database Architecture
- Ability to add data
- Ability to add new data fields
- Data alerts
- User graphs
- Medical professional area
- Medical professional graphs
- Security implementation
- Extra Implementations and improvements from user testing.

Testing Tasks:

- Writing unit tests to ensure maintainability of the system
- User testing research for usability
- User testing implementation

Milestone: Supervisor Review 3

Milestone: No further development on application.

Week 10:

The system will be evaluated in terms of how it relates to the initial proposal, this initial plan and the usability of the system. I will consider feedback from users to be able to justify my reasoning behind this.

Week 11 – Submission:

Compiling and writing the final report.

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Chronic Condition Research							
Choose chronic condition							
Researching chosen condition							
Choose relevant data fields							
Requirements							
Requirements Gathering							
Requirements Finalising							
Research into tools							
Choosing database technologies							
Choosing backend technologies							
Choosing frontend technologies							
Security research							
JI Design							
Creating use cases							
Creating UML diagram							
Wire frames of UI							
mplementation							
Basic Profile							
Ability to add data							
Ability to add new data fields							
User graphs							
Medical professional area set up							
Medical professional graphs							
Security Implementation							
Extra Implementation and improvements							
esting							
Unit testing of the system							
User testing research							
User testing							
system evaluation							
inal report compilation and write up							