CFS Pacing Program

Project Outline

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1 Project Description

The goal of this project is to create a program that can help people with Chronic Fatigue Syndrome, also known as Myalgic Encephalomyelitis, to keep track of their energy levels and identify patterns in them. More information on Chronic Fatigue Syndrome can be found here [1].

Chronic Fatigue and chronic fatigue-like symptoms have become more and more prevalent since the COVID19 pandemic. One study found that 13.3% of individuals who caught COVID19 developed "Long Covid" and 97% of them reported fatigue as a major symptom[2]. According to an article in the journal of translational medicine, a majority of studies found that pacing resulted in at least one highlighted improvement in a measured symptom [3, fig.2].

According to the NHS website, pacing is one of the major ways in which CFS is managed [4]. Pacing can be done with a mix of techniques, but one of the major ones is keeping an energy management diary [4][5].

This project aims to streamline the process of filling out a pacing diary or energy record through the use of technology. This would be accomplished using is a calendar system, with hourly increments and four columns for each day with four columns for each day, representing the four types of energy: physical, mental, emotional, and social. The user then needs to fill these in with five colours, representing how much energy they used.

This project also aims to enable users to easily identify patterns in the data, using an AI system. There will also be the possibility to integrate weather and daylight information from the MET Hub into the pattern recognition system.

Ideally, there would also be a system for a user to track other variables, such as when they are ill or menstrual cycles. This, however, is outside the scope of the current project.

2 Proposed tasks

2.1 Project Management Style

The plan for this project is to work in an agile style, using Kaban principles. Agile has a short development cycle (explain Agile and Kaban here with references).

2.2 Planning Phase

These tasks must be done before the rest of the project can commence.

- Choosing a platform:
  - Will this be a web-based application or a mobile one? Or perhaps a windows-based application? A functional means analysis needs to be done for this (see deliverables).
- Choosing a programming language:
  - A appropriate programming language needs to be chosen for this project. This will depend slightly on the platform chosen. A functional means analysis should also be done for this (see deliverables).

2.3 Design Phase

As this project is being done in an agile way, these tasks do not have a particular order that they must be done in, and can even be returned to a later point if something needs to change.

- Write Documentation
  - This project will need a design specification, a test specification, a test report, maintenance manual, and a user interface specification. I will also need to write my own general documentation standards document to ensure all the documentation is standardised and complete.

- Create GUI
  - This project will need an easy-to-use interface that can quickly be learnt by new users. It needs to be intuitive and accessible. The design for the GUI will be created as part of the Use Case documents.
- Create SQL database
  - This project will rely on a SQL database to hold all of the data that the user inputs.
- Link GUI and Database
  - The GUI and the SQL database need to be linked in such a way that the user can access their data securely, and only their data.
- Create AI to look for patterns in data
- Create system to get data from MET office Hub
- Think about encryption and ensure system is secure
- Create Git Repository for project

3 Project Deliverables

The project deliverables are divided into two sections, Documentation and Software.

3.1 Documentation

- Project Outline
  - This document needs to be completed by the (date) and submitted.
- General Documentation Standard
  - The General Documentation standard will define how the rest of the documentation looks, and therefore should be completed as soon as possible.
- Design Specification
  - The design specification will contain two parts - a requirements and concept analysis, and a functional analysis, describing the way the software will be broken into parts for implementation, and the relationships of those parts to each other.
- Use Case Specification
  - This document is made up of two parts - an article explaining the potential users and use cases and a presentation with a mock-up of the GUI for each use-case.
- Test Specification and Report
  - This document will specify all of the tests to be conducted and their results. If an automated testing system is implemented, that will be described here.

- Maintenance Manual
  - This document will specify how to use the software from a user perspective, how to troubleshoot it, and how to upkeep it.
- Final Report
  - This is the final report for the project worth (x)% , and must be submitted by (blank). It will contain (summary of final report).

3.2 Software

As this is an agile project, the exact software that gets delivered may differ slightly from this list as requirements change.

- SQL Database
  - This is the database which will hold all of the users' information.
- GUI Software
  - The Graphical User Interface needs to be needs to be accessible and intuitive.
- MET Office Hub Data Retrieval
  - This system needs to retrieve data from the MET Office Hub and integrate it into the database.
- AI Pattern Recognition
  - This system needs to analyse the information in the SQL database and identify patterns to present to the user.
- Integrated Software
  - This is the final software, where all parts of the code have been integrated and tested.

4 Bibliography

[1] `Myalgic encephalomyelitis or chronic fatigue syndrome (ME/CFS)', nhs.uk. Accessed: Feb. 01, 2024. [Online]. Available: https://www.nhs.uk/conditions/chronic-fatigue-syndrome-cfs/

[2] C. H. Sudre et al., `Attributes and predictors of Long-COVID: analysis of COVID cases and their symptoms collected by the Covid Symptoms Study App'. medRxiv, p. 2020.10.19.20214494, Dec. 19, 2020. doi: 10.1101/2020.10.19.20214494.

[3] N. E. M. Sanal-Hayes et al., `A scoping review of "Pacing" for management of Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS): lessons learned for the long COVID pandemic', Journal of Translational Medicine, vol. 21, no. 1, p. 720, Oct. 2023, doi: 10.1186/s12967-023-04587-5.

[4] `Myalgic encephalomyelitis or chronic fatigue syndrome (ME/CFS) - Treatment', nhs.uk. Accessed: Feb. 01, 2024. [Online]. Available: https://www.nhs.uk/conditions/chronic-fatigue-syndrome-cfs/treatment/

[5] `Pacing A5 booklet Oct 2023 aw.indd'. Action for ME, Oct. 2023. [Online]. Available: https://www.actionforme.org.uk/uploads/pdfs/Pacing-for-people-with-ME-2022.pdf

5 Version

Version	Author	Date	Description
0.1	Mrs12	31/01/2024	Document Created
0.2	Mrs12	01/02/2024	wrote drafts for both project decsription and proposed tasks
0.2.1	Mrs12	01/02/2024	fixed formatting on title page
0.2.2	Mrs12	01/02/2024	re-wrote the description with references
0.3	Mrs12	01/02/2024	wrote the proposed tasks and project deliverables
0.3.1	Mrs12	01/02/2024	spell-checked

Table 1: Version history