Developing a Perimenopausal Symptom Tracker to Aid in Symptom Awareness and Identification of Perimenopause

by

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In partial fulfilment of the
requirements for the degree of
Bachelor of Science
in
CS408: Individual Project

Department of
Computer and Information Sciences

April, 2025

Abstract

The abstract is a bird's eye view of the project.

It should not exceed one page. Mention the scope and objectives of the project, the methodology used,the main findings, and significance of your results.

Acknowledgements

I would like to thank the participants who evaluated my project, my supervisor etc.

Contents

1 Introduction

This is a concise and clear overview of your dissertation(more or less 2-3 pages). You can start off the project description provided of the project that was allocated to you and flesh it out.

Include (1) the problem you have tackled, (2) why this problem is worth addressing, (3) what you did to address it - in broad terms. Detail will come later.

i.e., issue(s) on which the research will focus, shall be clearly identified and described. You shall refer to past research work relevant to the topic and objectives, i.e, of the study. You shall outline where applicable the potential research output with respect to research transfer and uptake by the community.

The introduction says: this is an overview of the project. This is why I did it (the problem) and how I tackled it. It is the *runway* into the project. It lets the marker know what to expect of your report.

If you're doing a research project, this would be the place to include the research questions you plan to address. For example:

RQ1: Where did James Bond come from?

RQ2: Why are pumpkins orange?

If you're doing a project of type 1, include a list of objectives. For example:

Objective 1: Provide software to allow James Bond to become invisible.

Objective 2: Provide software to keep track of all loyalty points in one place.

Provide a 'map' of your dissertation. For example: Section 2 reviews the background literature that was reviewed to inform this project. Then Section 3.....

2 Background Literature

2.1 Perimenopause

The American Journal of Epidemiology[6] states that perimenopause is the transition period of a womans life, which starts with a natural shift in ovulation and menstruation patterns and/or increased symptoms, and ends when a woman enters menopause. It classifies menopause as when a woman has not had her period for a year. Thie Lancashire and South Cumbria NHS Foundation Trust's article on Perimenopause, Menoause, and Pain[20] states that during perimenopause, the body's production of estrogen, testosterone, and progesterone fluctuates significantly and can stay low forever if no treatment is taken. This change in hormones drastically changes the way a womans body and mind work. A Swiss Perimenopause study[29] found that women experiencing lower estrogen and progesterone levels had higher suicide intent scores and were more likely to develop depression, which is backed up by another study from the Journal of Psychiatric Research which found a correlation between low progesterone states and suicide[4]. Other effects of perimenopause are much more common, and perimenopause may not be the obvious source. During Perimenopause, 80% of women experience hot flashes[5], 77% joint pain[26], 60% memory issues[15], over 20% experience heart palpitations[27], 1/4 women have really heavy periods[18], 50% of women say it negatively impacts their sex lives[8], and 1/10 women leave their jobs because of menopausal symptoms[7]. It therefore comes as no surprise that almost 90% of women to seek out their healthcare provider for advice on how to cope[17]. However in the US, 3/4 of women who ask for medical help are left untreated causing women to turn to other sources of help and information[30].

2.2 Menopause Education

A University College London publication on women's post reproductive health[2] explores the extent of knowledge women have about menopause. When it comes to menopause, most women are left untreated and unsupported. Without sufficient education, most are left suffering due to hormonal imbalance and lifestyle changes they are unprepared for and do not have the information they need to help cope. In this study of 829 postmenopausal women, 90% were never educated about the menopause. It is rarely included in sexual

eduaction received in school and though awareness is increasing, it is still rarely talked about in the media and considered a taboo and private subject only to be talked about with your doctor[22]. This is further problematic as doctors too are not well educated on menopause[21]. The NHS site on the treatment of menopause[25] states that many menopause symptoms can be effectively treated with hormone replacement therapy (HRT), even symptoms such as hot flushes can improve within a few weeks. However, a study of 3000 british menopausal women who complained to their doctors of low mood or anxiety symptoms found that 66% were offered anti-depressants instread of hormones[24]. In fact, 1/4 of women are on anti-depresseants post menopause[9] despite the fact that antidepressants don't help low mood in menopausal women with hormone imablances, and according to the National Institute for Health and Care Excellence[23] HRT should be offered first. This may be largely due to lack of education doctors receive about menopause. 41% of UK medical schools do not give any mandatory menopause education[21]. Professor Joyce Harper, an internationally renowned, award-winning scientist and a professor of reproductive science at UCL, states that "The data shows that women have a lack of education about this key life stage. Together with a reported lack of education from their healthcare professionals, women may be left undiagnosed and unsupported"[28].

2.3 Symptom Tracking Apps and Technology

When women do not receive education from school, their communities, or their doctors about peri-menopause, they will look for tools and education from other sources such as websites or apps to research, track, and analyse their experience. Over 50 million women worldwide use apps to track their menstrual cycle and examine a variety of other cycle-related factors[19]. There are 300 menstrual tracking applications available for download and an estimated 200 million downloads worldwide[13]. Symptom monitoring and appraisal methods are effective for reducing menopausal symptoms, and improving health awareness, shared decision-making, patient-doctor communication, and treatment goal setting[3]. While these apps can be effective tools for dealing with symptoms, one of the most prominent issues with these apps are the lack of privacy. The apps often earn profits by selling users' data to third parties, even if there is a promise of privacy advertised by the companies[16]. An article by the Director of Research for Sexual and Reproductive

Health and Rights, Population Institute in Washington, DC titled, "Missed period? The significance of period-tracking applications in a post-Roe America" highlights the increased concerns around this surveillance capitalism since the June 2022 overturning of Roe vs Wade in the US stating that the right to abortion is not constitutionally protected[11]. It further explores how users personal tracking data may be used against them in court as evidence of having an abortion regardless of miscarriages, irregularities in menstrual cycles, and/or imperfect engagement with a period-tracking app. Some apps have even gone on record to say they will hand over users data to law enforcement if asked. The article even explains how some experts advise people who menstruate to track their periods on paper as opposed to using an app for their own protection. FemTech mobile apps currently fall outside of the scope of the Health Insurance Portability and Accountability Act, which protects sensitive health information from being disclosed by covered entities without the patient's consent or knowledge[14]. This highlights the ever increasing need for privacy in menstrual tracking apps. A study[10] exploring the design experience of digital period trackers found that to best design digital period trackers for users, Hertzum's images of universal, situational and cultural usability should be used. This correlates with Dawsons concepts of evidence-based, usable, readable, interactive, and culturally sensitive design choices for health apps [12]. It found that a good period tracking app should know the users life stage, medical "situation", contraception, purpose of tracking, and tracking interests. It also highlights the need for education resources within these health apps and the importance of users having access to relevant, reliable health information such as including external links to information. Not only do these peri-menopause apps have to be free, private, and personalised, but they must be accessible to all who want to use them. The European Accessibility Act (EAA) becomes law on the 28th of June 2025. The EAA is a landmark legal change that will improve the lives of disabled people by ensuring equal access to digital products and services for European Union (EU) consumers[1]. The EAA requires products and services to be Perceivable, Operable, Understandable, and Robust (known as POUR).

3 Specification & Design

Describe all details of the design and procedures used to achieve the project objectives. Do this chronologically.

It should be detailed enough to allow for an assessment of the rigour of your process, and, in the case of research projects, in terms of how well grounded your research is in the research literature. In these cases, refer back to relevant sections in the previous chapter.

Say which software lifecycle approach you used e.g., Waterfall, Spiral, Agile.

How did you gather user requirements?

3.1 Methodology

Which methodology did you choose?

3.2 Analysis

How did you decide on the particular software artifact you decided to develop?

3.3 Requirements

Here you explain what the functional and non-functional requirements are. Explain how you prioritised them. See `https://www.nuclino.com/articles/functional-requirements` for more information.

Functional requirement: "The system must **do** [requirement]."

Non-functional requirement: "The system shall **be** [requirement]."

Well-written functional requirements typically have the following characteristics:

Necessary: Although functional requirements may have different priority, every one of them needs to relate to a particular business goal or user requirement.

Concise: Use simple and easy-to-understand language without any unnecessary jargon to prevent confusion or misinterpretations.

Attainable: All requirements you include need to be realistic within the time and budget constraints set in the business requirements document.

Granular: Do not try to combine many requirements within one. The more precise and granular your requirements are, the easier it is to manage them.

Consistent: Make sure the requirements do not contradict each other and use consistent terminology.

Verifiable: It should be possible to determine whether the requirement has been met at the end of the project.

3.3.1 Functional Requirements

This is the **WHAT** of your artifact.

Functional requirements are product features that developers must implement to enable the users to achieve their goals. They define the basic system behavior under specific conditions.

Functional requirements need to be clear, simple, and unambiguous.Examples:

- The system must send a confirmation email whenever an order is placed.
- The system must allow blog visitors to sign up for the newsletter by leaving their email.
- The system must allow users to verify their accounts using their phone number.

3.3.2 Non-Functional Requirements

This is the **HOW** of your artifact. Example non-functional requirement: "When the submit button is pressed, the confirmation screen must load within 2 seconds."

3.4 Design

3.4.1 Interface Design

Explain how you used wireframes, and how you tested these to design the user interface.

3.4.2 System Design

Show how you designed your database (if appropriate) and how you designed your system architecture, and the individual parts. Use UML and an Entity Relationship diagram

4 Product

4.1 Implementation

Provide implementation details: language used, architecture (e.g. server and client, or hub and spoke). Explain how you secured personal details.

4.2 Verification & Validation

How did you verify that your software was debugged and worked correctly?

How did you validate that you had implemented all the functional and non-functional requirements?

5 Results & Evaluation

Results are often presented in tables, figures and other relevant illustrations. Include text that refers to these figures/tables.

5.1 Evaluation Process

If you involved humans in the evaluation, how many did you have? What can you say about the demographics of your participants? (If you did collect these)

In terms of the *user interface*, how did you carry out a usability evaluation, how did you go about doing this? How did you recruit participants?

In terms of delivering *functionality*, did you carry out user acceptance testing? (see attached guidance).

5.2 Results of Evaluation

This Section includes a direct interpretation of the gathered data and evaluation processes.

5.3 Returning to the Research Questions

Return to research questions or objectives as appropriate.

5.3.1 RQ1

It is clear from our findings that James Bond was born in Wigtown in Scotland. However, he grew up in Diss, in Norfolk. We know this because ....

5.3.2 RQ2

We were not able to answer this question from our studies, although some suggestions were made. These could not be proven.

5.3.3 Objective 1

5.3.4 Objective 2

6 Discussion & Reflection

6.1 Interpreting the Results

Here you will discuss your findings. This is especially relevant for research projects. You might interpret what the data and evaluation implies, both for future research and for practice (if appropriate).

The discussion is **not** a review of literature. You should try to compare research findings with previous work, provide explanations for your findings, discuss research findings, in terms of their contribution.

6.2 Reflection

Look back and think about what you would do differently if you were going to start the project with the knowledge you have now. Be honest about your mistakes or missteps.

6.3 Challenges

This is not the place to mention personal circumstances but rather challenges related to the work involved in the project.

6.4 Limitations

Acknowledge things like: small number of participants, software wasn't completely debugged, or whatever else went wrong and affected your project. *Include as appropriate*

6.5 Future Work

If someone else wanted to build on your project's product, what would be cool to do next?

7 Conclusion

The conclusion is similar to when a plane lands. You don't rewrite the introduction. You say something like - I addressed the problem outlined in the introduction, and I built some software to do this. I tested the software like this ADD FEW WORDS.

Summarize main findings drawn from the project work. Mention the objectives or research questions. Do not repeat points raised in the discussion and reflection Section. If applicable, you can make recommendations. The conclusion should NOT contain any references.

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A Appendix

This is where you can include your documentation.

Remember that the marker is not required to read this, but might well check to ensure that you have included product documentation, and ethical approval, as required.

A.1 Ethical Approval Form

If your project required you to do any evaluation with humans, you MUST include this. It can be downloaded from the Ethics system.

`https://local.cis.strath.ac.uk/wp/extras/ethics/index.php`

A.2 Participant Information Sheet

If your project required you to do any evaluation with humans, you MUST include this

`https://www.strath.ac.uk/ethics/informationsheetandconsentform/`

A.3 Consent Form

If your project required you to do any evaluation with humans, you MUST include this.

`https://www.strath.ac.uk/ethics/informationsheetandconsentform/`

A.4 Marking Scheme

REMEMBER TO DELETE THIS. IT IS ONLY INCLUDED FOR your INFORMATION.

11.2. Marking Schemes

There are three marking schemes which weight the assessment criteria as follows.

	Software Development Based	**Experimentation-based with Significant Software Development**	**Experiment-based**
Project progress presentation	10%	10%	10%
Product			
Implementation (including documentation as this indicates maintainability)	25	20	10
Verification and Validation	10	5	5
Product Total:	35%	25%	15%
Process			
Methodology, analysis and documentation	15	20	20
Design	10	5	5
Process Total	25%	25%	25%
Results and Evaluation			
	15%	25%	35%
Report Presentation			
	10%	10%	10%
Student Performance			
	5%	5%	5%