Initial Plan

Title: Developing an app that uses smart reminders to support habit formation

Author: Sophie Wells

Project Supervisor: Dr Katarzyna Stawarz

Project Moderator: Bailin Deng

Module Name and Number: One Semester Individual Project – CM3203

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Contents:

Project Description

Habits are automatic behavioural responses to environmental cues [1]. Study findings showed forty percent of the actions people perform each day were not conscious decisions but habits [2], highlighting the importance of people retaining healthy and sustainable habits.

The use of mobile devices has become an integral part of modern life with more than five billion people across the globe estimated to have a mobile device [3] and many people do not have the time or motivation to spend hours researching the psychology behind forming a habit effectively. As a consequence, many people are unable to develop and maintain positive habits and continue to be dictated by their unhealthy habits. Therefore, an app that embodies this research and supports people to develop healthy habits would conveniently fit into a modern lifestyle. Having easy access to the tool via their mobile device will encourage more people to actively attempt to form a chosen habit and stick to it. This is because, all the knowledge required will be at their fingertips and the ease of installation for users is shown by the fact 194 billion mobile phone apps were downloaded in 2019 [4].

Habit formation apps that are currently on the market rely heavily on daily reminders and manual tracking such as Strides and Streaks [5]. However, this method forms a long term reliance on the reminders as opposed to forming the habit itself [6]. Such apps are predominantly dependent on time frames which are not always practical for every habit. There are also numerous websites available that detail step-by-step guides to forming habits but do not support the user in doing so [7].

The aim of this project is to develop an Android app that is based around psychological theories to aid the process of forming a habit that is not solely based around reminders. In contrast to previous technologies with set timings, the intention of this app is to help users condition behaviours into their everyday routines [8] as well as direct them to helpful external tools such as books, websites and research papers to support their journey. This will be done based on the research into psychological theories and existing evidence detailed in the literature review, including but not limited to the following papers [8] [9] [10] [11]. The app is intended for short term until the user has formed the habit of their choosing and/or developed the skills to do so, which is estimated to take around sixty-six days [12].

After the app prototype has been developed, user questionnaires will be completed to assess the functionality and accessibility of the app. The system usability questionnaire will be used because it is a reliable tool for measuring usability with a universally used scale that is quick and easy to evaluate [13]. This is necessary because the app needs to be easy to navigate in order to encourage people to use it and not give up. There will not be sufficient time to test whether users are able to form a habit using the app because there is evidence to believe that a habit takes sixty-six days on average to form fully [12]. For this reason, self-report data will be collected to determine if any of the practices embedded in the app resonate with the users in the two-week period they had, allowing an insight into whether the app is on track to effectively aid the user in their habit development process. In addition to this, interviews will be conducted with all participants at the end of their two-week testing period and once they have completed the two questionnaires detailed over. The intention of this is to generate a better understanding of how the app was utilised with personal feedback and experiences. Such questionnaires and interviews will require ethical approval which will be applied for in week 3 of the project.

The proposed output of this project will be a functional prototype of an Android app that applies practices from psychological research to support the formation of healthy habits, that has been tested and evaluated on a brief timescale of two weeks.

Project Aims and Objectives:

<u>Aims</u>

- Develop a functional prototype of an Android app that is based around psychological theories of successful habit formation and is not based solely around regimentally timed reminders
- Tracking of the user's journey will be implemented and will have the option to be presented to the user in graphical form.
- User's will be provided additional resources to further learn the act of forming a habit.

<u>Objectives</u>

Research and Planning:

- Literature Review: Learn the basic psychology about how habits are formed in humans
- Literature Review: Research theories based around habit formation
- Determine how or if these theories are feasible to implement in a technological form
- Investigate current apps and websites already on the market, noting any useful techniques

Identify and Define Requirements:

- Using the literature review, generate a list of functional and non-functional requirements for the system.
- Review the functional and non-functional requirements and ensure the app will differ from those already on the market.

Design and Implementation of the App:

- An alternative to constant regimentally timed reminders will be implemented based on findings in the literature review
- Design will be based around the psychological theories researched
- The app will contain a form of tracking for the user's habit formation journey
- Additional resources will be linked in the app such as books, websites and research papers.

Test and Evaluate:

- Allow a two-week period for testing the app
- Collect data on usability using the system usability questionnaire
- Generate self-report data to get an insight on participant's experience with the app
- Conduct interviews with participants about their experiences and feedback

Documentation:

- Documentation will be done continually throughout to ensure details of the development process are not missed.
- The main body of documentation will be split into: introduction, background, approach, implementation, results and evaluation, future work and conclusions

Initial Requirements and Constraints

The mobile application will:

- Be developed for the Android platform exclusively
- Require device permissions to allow for notifications
- Require the user to have a desired habit in mind before use of the application
- Requires a device that is able to present the statistical analysis of their journey in graphical form

Work Plan:

The development of this mobile application will take on an agile development approach, allowing work on multiple things simultaneously such as documentation and app development. This will ensure that all milestones in the development are adequately documented because documentation will be done when the events occur ensuring important details are not forgotten or missed. The work plan will be adapted if appropriate after consultation with my supervisor.

Overview of deliverables:

Deliverable	Due Date
Initial Report	08/02/2021
Final Report	14/05/2021
Application Source Code	14/05/2021

Week 1 (1st – 7th Feb):

- Complete the following for the Initial Report:
    - Project Title
    - Project Description
    - Project Aims and Objectives
    - Work Plan including a risk plan and Gantt chart
    - References
- Research successful habit formation in humans

Week 2 (8th – 14th Feb):

- Further research on habit formation, finding theories that could be implemented in the app.
- Begin to set up development environment
- Start working on ethics application

Deliverable – Initial Report 08/02/2021

Week 3 (15th – 21st Feb):

- Start app development

- Start documentation of design
- MILESTONE - submit ethics application
- MILESTONE - send supervisor background chapter draft

Week 4 (22nd – 28th Feb):

- Continue app development – have a basic interface with some functionality
- Add to implementation documentation
- MILESTONE - send supervisor approach chapter draft

Week 5 (1st – 7th March):

- The app should have basic reminders and tracking system
- Document the progress of the apps features
- Should have heard back from the ethics board – adapt plan accordingly
- MILESTONE - send supervisor introduction chapter draft
- MILESTONE – basic functionality of the app implemented

Week 6 (8th – 14th March):

- Start implementation of psychological theories found
- Begin evolution of reminders to researched alternatives

Week 7 (15th – 21st March):

- Continue work on from week 6
- Document apps additional functionality progression

Week 8 (22nd - 28th March):

- Improve interface of the app
- Document all of the apps features and its interface
- MILESTONE - send supervisor implementation chapter draft
- MILESTONE - finish app prototype

Easter Recess (29th – 18th April):

- 3-week buffer period (catch up if needed)

Week 9 (19th – 25th April)

- Ensure participants have filled out a consent form and read the participant briefing
- Test the app on a sample of participants
- Document the process of ethical testing with consent forms, participant briefing and debriefing forms
- Start evaluation of the app

Week 10 (26th – 2nd May)

- Continued participant testing
- Finish individual evaluation of the app
- Ensure participants receive a participant debrief at the end of the testing week
- MILESTONE – complete testing phase
- MILESTONE – send supervisor future work chapter draft

Week 11 (3rd – 9th May)

- Start of the week – conduct interviews with participants
- Document the interview process
- Collate data collected from testing
- Complete results and evaluation chapter
- MILESTONE – send supervisor results and evaluation chapter draft
- MILESTONE – final look over from supervisor

Week 12 (10th – 14th May)

- Make improvements suggested in final look over from the supervisor
- MILESTONE – Finish and submit final report

Deliverables – Final Report 14/05/2021 and Application Source Code 14/05/2021

Risk Plan:

Risk	Likelihood	Impact	Mitigation
Illness (Coronavirus or other)	High	Medium	Maintain regular contact with supervisor and apply for extenuating circumstances if necessary.
Loss of Data	Low	High	Ensure regular documentation and source code is regularly backed up.
Not having enough time to complete app development, testing and/or documentation.	Medium	High	Follow the work plan and ensure milestones are being met on time. Prioritise requirements with supervisor to ensure the core functionality is there if time becomes an issue.
Struggle finding participants	Low	Medium	Use all resources available to me such as social media platforms to find participants, eg. Putting a status on Facebook asking for participants or asking family members.
Participants becoming ill and unable to complete the evaluation.	Medium	Low	If there is time, find a new participant. Else, cut the participants partial results and explain in the evaluation why the sample size is smaller than intended. The intention is to have 15-20 participants, anticipating that 5 will not drop out or not complete the study, leaving a sufficient sample size of 10-15.
Delays in app development	High	High	A three-week buffer during the Easter recess is scheduled to ensure any complications in app development will not result in delays to testing.

Gantt Chart:

Task	01/02/2021	08/02/2021	15/02/2021	22/02/2021	01/03/2021	08/03/2021	15/03/2021	22/03/2021	29/03/2021	05/04/2021	12/04/2021	19/04/2021	26/04/2021	03/05/2021	10/05/2021
Initial Report	■														
Ethics application		■	■												
Introduction chapter		■	■	■											
Introduction draft to supervisor				■	■										
Background chapter	■	■													
Background draft to supervisor			■												
App - core functionality		■	■	■	■										
Approach chapter		■	■												
Approach draft to supervisor				■											
App - additional functionality						■	■	■							
Implementation chapter		■	■	■	■	■	■								
Implementation draft to supervisor								■							
Completion of app development									■						
Easter recess (catch-up if needed)									■	■	■	■			
App testing												■	■	■	
App evaluation												■	■	■	
Conduct interviews												■	■	■	
Collate test data												■	■	■	
Future work chapter												■	■	■	
Future work draft to supervisor												■	■	■	
Results&evaluation chapter												■	■	■	
Results&evaluation draft to supervisor														■	
Supervisors final look over														■	
Final changes and submission															■

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