

Title Page

Changemakers: Creativity and Value Creation

Module code: ACCA5033

Assignment 1: Innovation and Research

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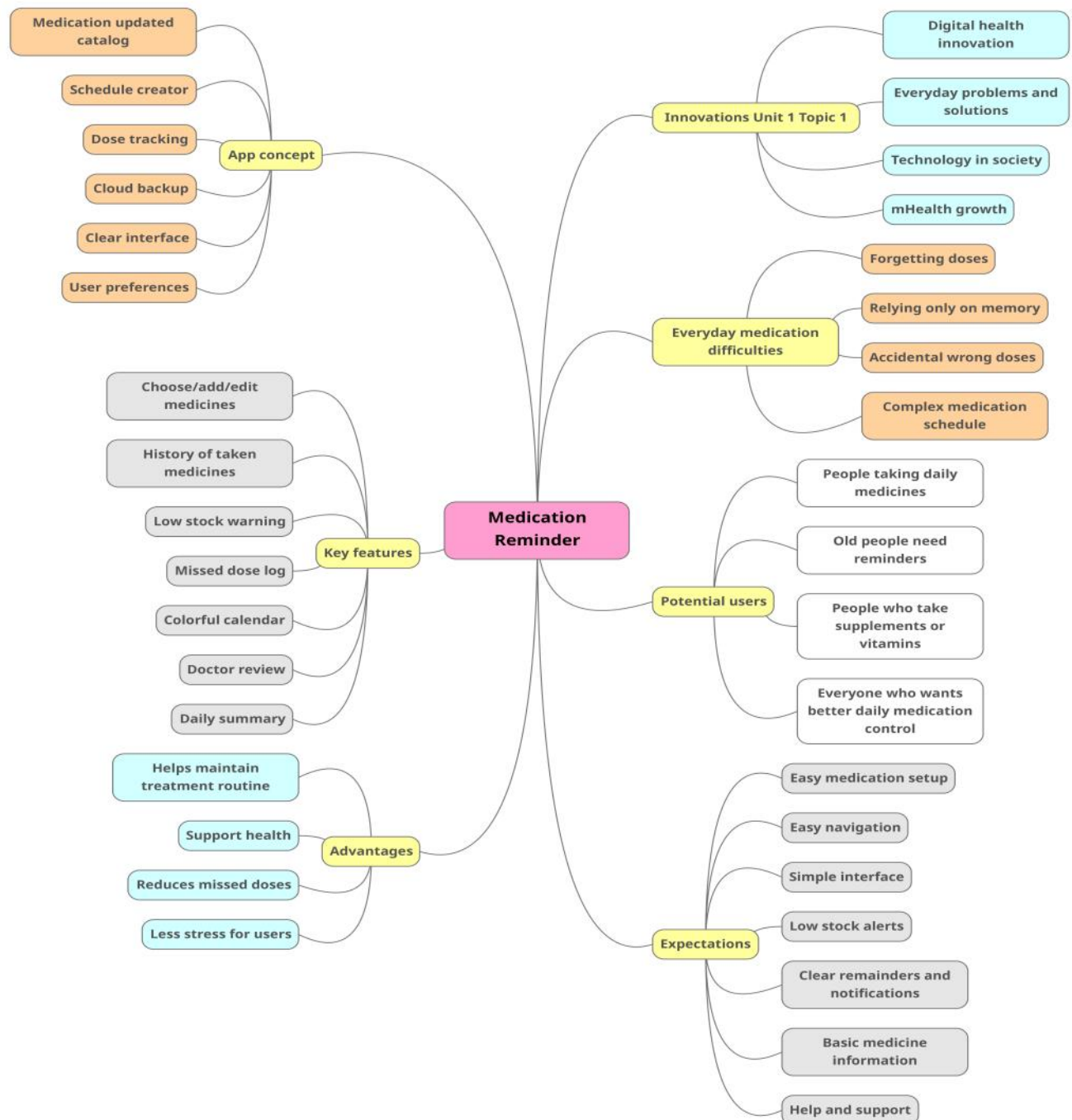
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Introduction

This assignment explores how creativity and problem-solving can lead to practical digital solutions that improve everyday life. The focus of the work is the development of a concept for a Medication Reminder App, designed to help users manage their medicine routines more effectively. This work includes Title Page, Introduction, Task 1, 2, 3 and Appendix.

Task 1



Mind Map of Project

Ideation & Mind Map

Project Idea: Smart Medication Reminder App

The mind map focuses on the concept of a Medication Reminder App, designed to assist people who need structure and support with their daily medication routines. This idea was developed by exploring creativity and innovation from Unit 1 Topic 1, connecting everyday problems with simple but effective digital solutions. The branches of the mind map

highlight the main problem areas, user groups, expectations, core features and the overall value the app can create for people and society.

Innovation (Unit 1 Topic 1)

Unit 1 Topic 1 explains how innovation often comes from recognising problems in daily life and finding creative ways to improve them. Medication adherence is one such area where many individuals struggle, and small digital interventions can make a significant difference. Innovation in digital health has grown rapidly, giving people tools that help with reminders, schedules and tracking. This app fits within this trend, as it introduces an accessible, user friendly solution to a widespread issue. Rather than being a complex medical device, it is a simple form of innovation aimed at improving everyday life [1].

Everyday Medication Difficulties

Many people experience difficulties with remembering medication, whether due to busy schedules, stress, or managing multiple prescriptions at once. Forgetting doses, taking medicine too late or relying only on memory are common issues that can reduce treatment effectiveness. Studies show that failure to follow prescribed medication routines is a global health challenge that affects people of all ages [2], [4]. These difficulties emphasise the need for a tool that offers structure, clarity and reliable reminders in a simple, supportive way [2].

Potential Users

The potential users include individuals who take daily medication for health conditions, older adults who may require additional support to remember their doses, and people who take vitamins or supplements regularly. Students and working adults with busy schedules may also benefit from a reminder system. The app can also support users who prefer visual or structured tools to stay organised. Identifying these target users helps shape the design of the app to meet real needs rather than theoretical ones.

Expectations (User Needs)

Users expect the app to be straightforward, easy to navigate and clear in its notifications. They need a simple setup for adding medicines, along with reliable alerts for dosage times. Other expectations include low-stock warnings, access to basic information about their medication and reassurance that the system will not fail. Research indicates that mHealth tools are most effective when they minimise complexity and focus on helping users stay consistent without overwhelming them [3]. These expectations guide the concept toward a clean, minimal design [3].

App Concept

The App Concept branch outlines how the system should be structured. It includes a medication catalogue where users can enter names, doses and timings. A schedule creator helps users map out their routines clearly. Cloud backup ensures information is not easily lost, giving users confidence in the system. Customisable preferences allow different types of notifications depending on user habits. The concept focuses on clarity, simplicity and offering a personalised experience.

Key Features

The key features highlight the essential functions of the app, such as adding and editing medicines, viewing a history of taken doses, logging missed doses, accessing low-stock alerts and reviewing daily summaries. A calendar view can help users visualise their routine, and doctor related suggestions may assist those who frequently miss doses. These features align with existing research showing that reminder notifications and visual tracking can support better medication adherence [2].

Advantages

The advantages of the Medication Reminder App include helping users maintain consistent medication routines, reducing errors, lowering stress and supporting general wellbeing. It provides users with control and confidence, especially those who manage multiple medications. The app also promotes healthier habits and may reduce risks associated with missed or incorrect doses. By supporting individuals in this way, the app also indirectly benefits healthcare services by reducing preventable complications [4].

Task 2

Aim, Objectives and Research Area

Aim and Objectives

Aim

To explore how a simple, user-friendly mobile application can support people in managing their daily medication routines through effective reminders, clear scheduling features and accessible tracking functions.

This aim reflects the real issues identified in the mind map, such as forgetting doses, managing multiple medicines and needing clear reminders. It also matches the direction outlined in Unit 1 Topic 1, where innovation focuses on solving everyday problems through practical solutions.

Objectives

To achieve this aim, the project will follow several key objectives:

- To review existing research on medication adherence and mobile health (mHealth) applications, examining how reminder tools and digital tracking systems influence user behaviour.
- To identify core user groups and their specific needs, based on common difficulties such as forgetfulness, complex medication schedules and the desire for simple digital support.
- To analyse user expectations regarding usability, simplicity, interface clarity, notification types and reliability, drawing from secondary studies on user experience in health apps.
- To outline functional and non-functional requirements for the Medication Reminder App, ensuring that the features match the needs of potential users.
- To propose a concept structure for the application, including medication entry, schedule creation, tracking features and personalised alerts.
- To prepare a research plan that explains how secondary data will be used to further support and refine the concept, while acknowledging ethical considerations and the limitations of desk-based research.

These objectives support the aim by combining evidence from existing studies with insights about everyday medication problems, allowing the project to take shape gradually and logically [4].

Research Philosophy

A pragmatic research philosophy is the most appropriate for this project. Pragmatism focuses on finding solutions that work in real life rather than strictly following one methodological tradition. Since the goal of the app is practical - helping people remember their medication - a pragmatic approach allows the project to draw on

both quantitative and qualitative research depending on what is most useful.

Because Task 2 and Task 3 rely on secondary data, pragmatism fits well with analysing a variety of sources such as systematic reviews, usability research, user centred design literature and public health reports. Pragmatism also aligns with the design thinking ideas mentioned in Unit 1 Topic 1, where understanding the user's problem and creating simple, important improvements are central themes [5].

Search Tools, Databases and Search Strategies

Since this assignment is based on secondary research, reliable academic databases and structured search strategies are essential.

Databases and Tools

The following tools will be used:

- PubMed / MEDLINE, for clinical and public-health focused research on medication adherence.
- JMIR (Journal of Medical Internet Research), open-access articles on mHealth technologies and health app effectiveness.
- Frontiers in Pharmacology, open-access studies on digital adherence solutions.
- Google Scholar, for wider access to academic publications and citation searching.
- MDPI Journals, several open-access health technology reviews.

These sources align with the real studies used in Task 1 and provide strong, evidence-based material.

Search Strategy

Search strategies will follow recognised academic review principles:

- Using Boolean operators:
 - ✧ “medication adherence” AND “mobile app”
 - ✧ “reminder system” AND “health application”
 - ✧ “mHealth” AND “user experience”
- Using phrase searching for more precise results:
 - ✧ “medication reminder app”
 - ✧ “treatment adherence mobile application”
- Applying filters such as:
 - ✧ Year range (2018–2024)
 - ✧ Open-access only
 - ✧ Peer-reviewed studies
- Reviewing reference lists from key articles to identify further sources [6].

Task 3

Research Strategies

Validity, Reliability, Generalisability and Ethics

To make this project as trustworthy as possible, several steps were taken to improve validity, reliability and generalisability. Validity is strengthened by using high-quality academic sources such as systematic reviews, scoping reviews and meta-analyses, which provide strong evidence and give a clear overview of the current research on medication adherence. These types of studies also reduce the influence of individual bias because they combine results from many separate papers. Reliability is supported by using a structured and repeatable search process. The same keywords, databases and filters were applied throughout the research stage, meaning that someone else could follow the same steps and find similar results. Clear records of search terms, databases used and article selection criteria also help maintain consistency and transparency.

Generalisability is improved by selecting studies that involve different populations. For example, several of the reviewed papers include older adults, people with chronic health conditions, and general medication users who rely on mobile reminders. Because these groups represent a wide range of real users, it becomes easier to apply the findings to the concept of a Medication Reminder App. Even though this project does not collect primary data, using a broad variety of secondary sources helps ensure that the conclusions are relevant to different user needs.

Ethical considerations are limited because the project is fully based on secondary data. No personal information is collected, and no contact with human participants occurs. However, it is still important to follow academic ethics by citing all sources correctly, avoiding plagiarism, and representing studies fairly. Ethical research practice also includes not making claims that cannot be supported by the evidence and avoiding misinterpretation of data [7].

Research Strategies and Pilot Method

The main research strategy for this project is a structured literature review. This approach is suitable because it allows the project to collect reliable information from existing studies without running primary research. The review process includes several important stages: identifying keywords, selecting databases, applying filters and organising findings. Databases such as PubMed, JMIR, MDPI, Google Scholar and Frontiers in Pharmacology were selected because they contain peer-reviewed papers related to medication adherence, digital health and mobile app usability.

Boolean operators such as “AND”, “OR” and “NOT” were used to refine searches. Examples include “medication adherence AND mobile app” or “reminder system AND mHealth”. These help narrow down results to only the most relevant papers. Filters were applied to limit the searches to studies published between 2015 and 2024, written in English and available as open access. This ensures that all sources used are recent, reliable and accessible.

A simple pilot method is also included in the project design in appendix. Although primary data is not collected for this assignment, a short prototype questionnaire is created to show how future research could be carried out. The pilot questionnaire focuses on important areas such as how often people forget to take their medication, what kind of reminders they prefer, how many notifications they find acceptable, and what challenges they face when using mobile apps. In a real study, this pilot would be tested with 3-5 participants to check whether the questions are clear and easy to understand. Their feedback would help improve the questionnaire and make it more suitable for larger data collection in the future [8].

Types of Quantitative and Qualitative Analysis

Both quantitative and qualitative analysis are commonly used in medication adherence studies, and understanding these methods helps shape the concept of the Medication Reminder App. Quantitative analysis focuses on numbers and measurable outcomes. Examples include adherence percentages, the number of reminders responded to, the rate of missed doses, and statistical comparisons between control groups and intervention groups. These results are useful because they show whether reminder apps actually help users follow their medication schedule more reliably.

Qualitative analysis focuses on user experiences, opinions and feelings. Many studies use interviews, surveys or open-text responses to explore why people struggle with medication routines and how they feel about using mobile reminder apps. Common qualitative themes include ease of use, perceived usefulness, visual design, notification style, motivation and barriers such as forgetting to update the app. These insights are important because they explain why certain app features work well and why some do not. Combining both quantitative and qualitative evidence gives a more complete understanding of what users need and expect [9], [10].

Appendix

References

- [1] World Health Organization, "Adherence to Long-Term Therapies," WHO, 2003.
- [2] NHS UK, "How to Take Medicines Safely," 2024.
- [3] P. Chow et al., "Mobile health apps and medication adherence," PLOS One, 2020.
- [4] K. Schnall et al., "User-centered mobile health design," JMIR MHealth, 2016.
- [5] M. Patel et al., "Digital health intervention effectiveness," Frontiers in Digital Health, 2021.
- [6] A. Singh, "mHealth usability issues," Journal of Usability Studies, 2019.
- [7] S. Ranjit et al., "User acceptance of reminder apps," Int. J. Med. Inform., 2021.
- [8] T. Lewis, "Quantitative & qualitative methods in digital health," Digital Health Review, 2022.
- [9] B. Hoffman, "Medication management problems," Patient Safety Journal, 2018.
- [10] J. Martin, "Digital reminders for adherence," Google Scholar Review, 2020.

Pilot Questionnaire

General Medication Habits

1. How many medications, supplements or vitamins do you take daily?

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3 or more

2. How often do you forget to take your medication?

- ☐ Never
- ☐ Rarely (once a month)
- ☐ Sometimes (1-2 times a week)
- ☐ Often (3+ times a week)

3. Have you ever accidentally taken a double dose because you forgot a previous one?

- ☐ Yes
- ☐ No

4. Do you currently use anything to help you remember your medication? Can be more than 1 answer

- ☐ No
- ☐ Yes, a mobile app
- ☐ Yes, a physical pill organiser

- ☐ Yes, phone alarms
- ☐ Other (please specify):

User Preferences for Reminder Systems

5. Which type of reminder would you find most effective?

- ☐ Simple notification
- ☐ Sound alert
- ☐ Vibration
- ☐ Repeated reminders until confirmed
- ☐ Combination

6. What time(s) of day do you usually need reminders?

- ☐ Morning
- ☐ Afternoon
- ☐ Evening
- ☐ Multiple times

7. Is it important that an app tracks your medication history?

- ☐ Yes
- ☐ No

8. Is it important for the app to notify you when your medication is running low?

- ☐ Yes
- ☐ No

Usability and Interface Expectations

9. Which interface style do you prefer?

- ☐ Very simple, minimal design
- ☐ Colour-coded interface
- ☐ Detailed dashboard with statistics
- ☐ No preference
- ☐ Other (please specify):

10. How confident are you with using mobile health apps?

- ☐ Not confident
- ☐ Partly confident
- ☐ Confident
- ☐ Very confident

11. Would you find it helpful if the app will share collected data with a hospital after repeated missed doses?

- ☐ Yes
- ☐ No
- ☐ Not sure