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# **Initial Plan**

## Building a Decentralised Social Media Platform

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CM3203 - ONE SEMESTER INDIVIDUAL PROJECT

40 CREDITS

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# 1 Project Description

## 1.1 Context and Overall Aims

With internet users spending more time on social media per day than the length of a typical movie and the number of users predicted to continue climbing, the rise of social media platforms plays an evermore important role in our lives.<sup>[1][2]</sup> However, over the last couple of decades we have become more aware of the flaws various social media platforms. Only last year, Meta (at the time called Facebook) had a major outage that affected Facebook, Whatsapp and Instagram.<sup>[3]</sup> Data breaches and cyberattacks are also problems faced by centralised platforms.<sup>[4][5]</sup> Additionally, several major platforms have also come under controversy around data privacy and biased algorithms in recent years, such as the Facebook-Cambridge Analytica scandal or YouTube's algorithms recommending conspiracy videos.<sup>[6][7]</sup> Despite this, the underlying model of many social media platforms has not significantly changed since their inception - where data is primarily stored and controlled (to varying extent) by platform owners rather than users.

I am aiming to build a decentralised social media platform that does not use dedicated servers to store data, developing in the Agile methodology. User data will be primarily stored locally on the user's device and can be permissively shared with peers as the user wishes. This means that the platform doesn't rely on a central point of failure, while end users fully control their data. The proliferation of smartphones, better internet speeds and greater device storage capacity enables development of such a platform.<sup>[8][9]</sup>

I will develop this platform in the form of a peer-to-peer social media app for Android as an alternative to existing social media. I will likely build this app in JavaScript with React Native with the libp2p library, though I will also consider using Flutter.<sup>[10][11][12]</sup> Various decentralised social media projects have started up over the years, some more successful than others. Some apps such as Manyverse and Berty come very close to the solution I am proposing, but have deficiencies that I would like to address in this project.<sup>[13][14]</sup> For example, Manyverse does not allow you to delete posted content, which I would consider a fundamental flaw in the design when considered as an alternative social platform.

## 2 Project Aims & Objectives

### 2.1 Core Objectives

1. Identify key features and problems in popular centralised social media platforms, then compare these with existing decentralised alternatives.
2. Determine the requirements of a generic decentralised social media platform based on identified features and problems, and specify more specific MVP (Minimum Viable Product) requirements for a mobile application.
3. Investigate peer-to-peer networking technology and how it can be used to emulate key features of social media platforms, including but not limited to direct messaging and content feeds.
4. Design a peer-to-peer social media application for Android mobile devices that considers user experience while minimising network usage.
5. Build a peer-to-peer MVP social media application for mobile devices that:
  - a. Does not store user generated content or personal data on a server.
  - b. Uses a peer-to-peer network for sharing multimedia content between users, including text and images.
  - c. Lets users explicitly configure who can or cannot view their content.
6. Carry out user testing and survey the participants for feedback.
7. Evaluate the application, comparing it to other social media platforms and determine whether it meets these objectives.

### 2.2 Stretch Goals

These are additional aims to target if the core objectives are met ahead of schedule, allowing more time to be spent improving the project.

1. Build more features into the app to meet additional requirements identified for core objective 2 that do not comprise the MVP.
2. Add support for distributing and caching user generated content across peer users in the app so content can be accessed even when the source user is offline, taking care to keep the impact on network and device usage low.
3. Deploy the app for use in a web browser, either as a dedicated web app or a web browser extension.
4. Add support to the app for controlling user data across multiple devices.

## 3 Work Plan

### 3.1 Weekly Tasks and Milestones

TABLE 3.1.1

Week	Tasks	Milestones
1	<ol style="list-style-type: none"><li>1. Research background about problems with existing social media platforms and consider how decentralisation could be used to solve some of these issues.</li><li>2. Write up this initial plan document.</li></ol>	<ul style="list-style-type: none"><li>- Project starts.</li></ul>
2	<ol style="list-style-type: none"><li>1. Research key social media platform features and design patterns.</li><li>2. Writeup MVP requirements.</li><li>3. Create user personas.</li><li>4. Create MVP use case diagram.</li><li>5. Create initial MVP use case scenarios.</li></ol>	<ul style="list-style-type: none"><li>- <b>Initial plan submission.</b></li><li>- Weekly supervisor meetings arranged (Mondays at 14:00).</li><li>- Start final report.</li></ul>
3	<ol style="list-style-type: none"><li>1. Design the user interface for creating an identity and messaging another user.</li><li>2. Start working on the Android app.</li></ol>	<ul style="list-style-type: none"><li>- <i>First sprint.</i></li><li>- Start of app development.</li></ul>
4	<ol style="list-style-type: none"><li>1. Writeup additional non-MVP requirements.</li><li>2. Design the user interface to catalogue and message other users.</li><li>3. Add the ability to connect multiple users peer-to-peer, send messages and automatically cache data in the app.</li></ol>	<ul style="list-style-type: none"><li>- <i>First sprint ends.</i></li><li>- Peer-to-peer messaging implemented.</li><li>- Ethics approval request submitted.</li></ul>
5	<ol style="list-style-type: none"><li>1. Design the user interface for viewing, creating and interacting with multimedia content posts.</li><li>2. Implement peer-to-peer content viewing, creation and interactions in the app.</li></ol>	<ul style="list-style-type: none"><li>- <i>Second sprint.</i></li></ul>
6	<ol style="list-style-type: none"><li>1. Design the user interface for configuring content sharing and other settings.</li><li>2. Implement settings configuration section in the app.</li></ol>	<ul style="list-style-type: none"><li>- <i>Second sprint ends.</i></li><li>- Content posts and sharing working.</li></ul>

7	<ol style="list-style-type: none"> <li>3. Design and implement app notifications.</li> <li>4. Design and implement onboarding hints in the app.</li> <li>5. Update app settings section to include notifications and onboarding hints configuration options in the app.</li> </ol>	<ul style="list-style-type: none"> <li>- <i>Third sprint.</i></li> <li>- Final components of MVP app implemented.</li> </ul>
8	<ol style="list-style-type: none"> <li>1. Create test cases based on use cases.</li> <li>2. Carry out thorough testing to identify bugs in the app and then fix them as necessary.</li> </ol>	<ul style="list-style-type: none"> <li>- <i>Third sprint ends.</i></li> <li>- Notifications, onboarding and most bugs fixed.</li> <li>- First progress meeting with supervisor.</li> </ul>
9	<ol style="list-style-type: none"> <li>1. Carry out user testing for app feedback.</li> </ol>	<ul style="list-style-type: none"> <li>- User testing week.</li> </ul>
10	<ol style="list-style-type: none"> <li>1. Follow up feedback from user testing, make amendments to app design as necessary.</li> <li>2. Make changes to the implementation as per any amendments to app design.</li> </ol>	<ul style="list-style-type: none"> <li>- <i>Fourth sprint.</i></li> </ul>
11	<ol style="list-style-type: none"> <li>1. Fix any outstanding bugs in the app.</li> <li>2. Tidy up app code and documentation.</li> <li>3. Writeup steps for installing the app.</li> <li>4. Begin writing the project evaluation.</li> <li>5. Record video demo of the app working.</li> </ol>	<ul style="list-style-type: none"> <li>- <i>Fourth sprint ends.</i></li> <li>- Final version of the Android app completed.</li> <li>- Second progress meeting with supervisor.</li> </ul>
12	<ol style="list-style-type: none"> <li>1. Evaluate the project and compare the Android app to other social media apps.</li> <li>2. Finish writing the final report.</li> </ol>	<ul style="list-style-type: none"> <li>- <b>Final report submission with code, app and video demo.</b></li> </ul>

I will continue to update sections of the final report in finer detail throughout the project. The term *design* encompasses development of use cases, diagrams, UI mockups and other aspects of the design process to be detailed in the final report. I will submit an ethical approval document by week 4 such that I can carry out user testing of the app in week 9 and receive feedback via a questionnaire. Official deliverables are shown in **bold** type in the Milestones column of table 3.1.1.

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