AndroCom: P2P Communication without Internet

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Chapter 1
Introduction

1.1 Project Introduction

In today's world, the internet has become such an integral part of our lives that if it were to go down tomorrow, most forms of communication, such as messaging, calls, and video communication, would cease to function. *AndroCom* is an Android app that enables its users to send text messages, make voice calls, and engage in video calls with complete end-to-end encryption when communicating with other users without the need of an internet connection.

AndroCom has significant market potential due to its unique features. It can work in places with no internet, help universities with daily tasks, and serve as a reliable backup during internet outages or emergencies. Its versatility and special capabilities make it valuable in various situations, making it an important tool in the market.

This functionality is implemented through an AD HOC network that is created using a microcontroller, specifically a Raspberry Pi, which serves as a critical component of the system. A server is created on the Raspberry Pi using Python, enabling packet transfer between the Raspberry Pi and the devices using AndroCom. This innovative setup ensures secure and efficient communication while bypassing the need for a traditional internet connection, addressing the challenges posed by internet interruptions or limited access scenarios.

1.2 Existing Examples / Solutions

At present, a noticeable gap exists in the market for apps that offer communication functionality independent of an internet connection. AndroCom, by enabling text messaging, voice calls and video calls with end-to-end encryption using Raspberry Pi, distinguishes itself as an innovative solution that fills this void. Unlike conventional applications that rely on internet connectivity, AndroCom offers users a novel approach to communication in scenarios where such connectivity may be unavailable or limited, addressing a critical need in today's interconnected world.

1.3 Business Scope

The business scope of AndroCom is promising, offering a unique solution for communication in scenarios with limited or no internet access. It caters to a niche market and educational institutions, presents a valuable tool for disaster recovery and emergency services, and has the potential to serve as a backup communication service during internet outages. With its AD HOC networking capabilities, it can find use in various temporary gathering scenarios. The app's focus on data privacy and security also appeals to users prioritizing secure communication, while its potential global reach ensures a broad user base.

1.4 Useful Tools and Technologies

Following is a list of technologies that are used for designing, development and testing phases of the project:

- Kotlin
- Java
- Android Studio
- Figma
- Raspberry Pi
- Python

In our application development, we will employ a hybrid approach, primarily utilizing Kotlin for its modern features and conciseness, while also integrating Java where necessary for specific algorithms, socket programming and several modules. Android Studio will serve as our development environment of choice, offering a comprehensive set of tools for efficient coding and testing. Notably, our app will not rely on an internet connection due to its offline functionality. An AD HOC network is created using Raspberry Pi with a server implemented in Python.

1.5 Project Work Breakdown

The project work breakdown for the AndroCom is given in Figure 1.1.

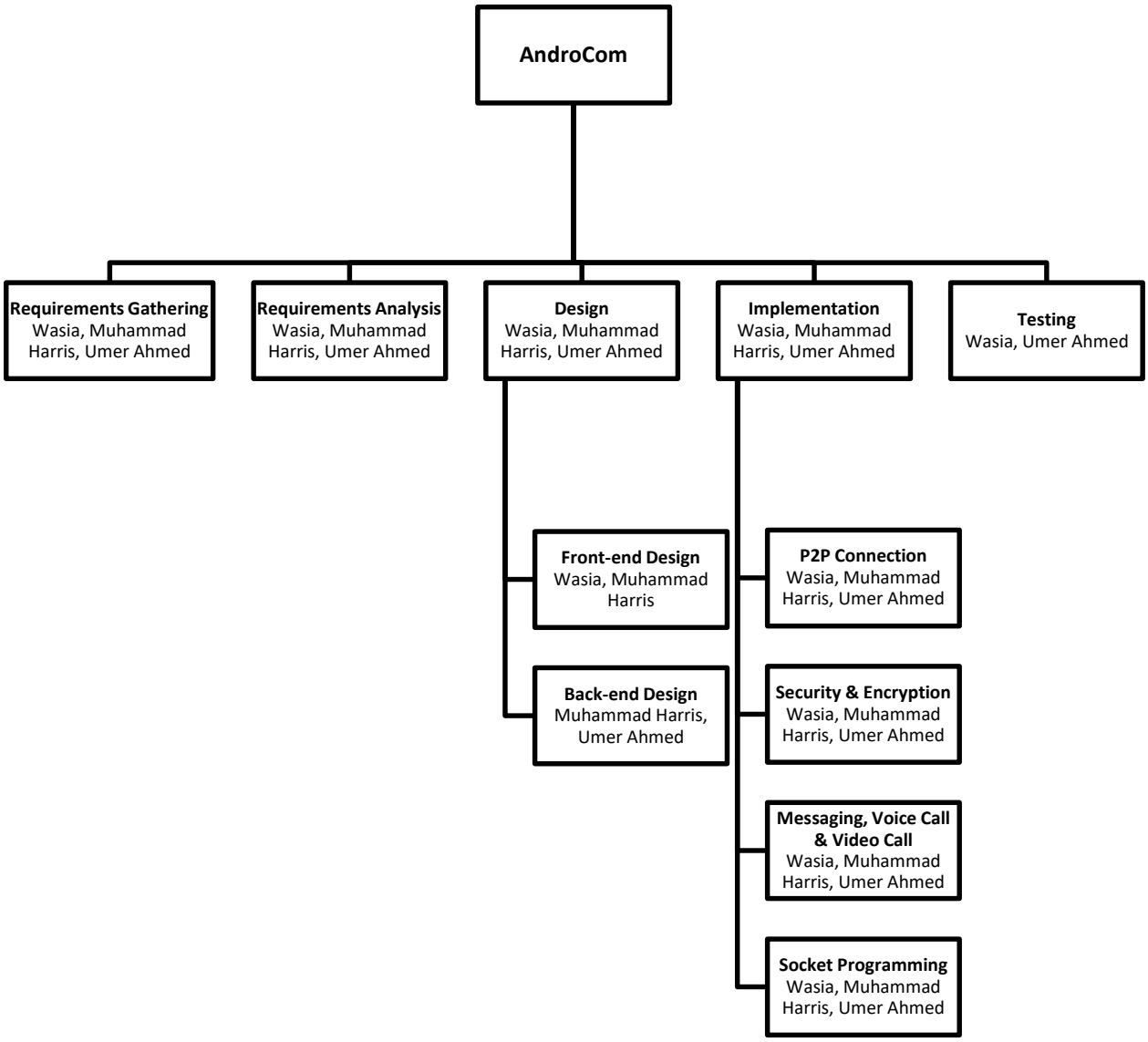

Figure 1.1: Project Work Breakdown

1.6 Project Timeline

The project timeline for AndroCom is given in Figure 1.2.

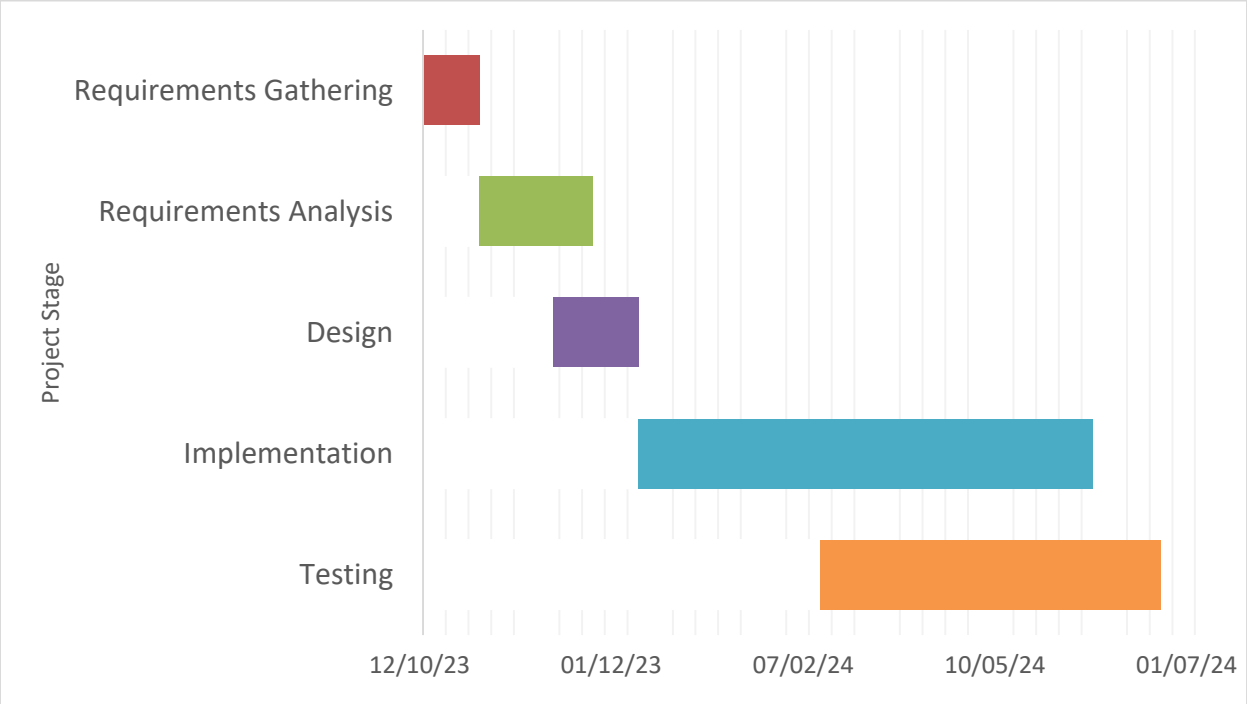

Figure 1.2: Project Time Line