جامعة اليمامة
Al Yamamah University

AL YAMAMAH UNIVERSITY

College of Engineering and Architecture

Bachelor of Science in Software and Network Engineering

Muwaqqit: An Elegant, iOS-based Calendar Manager

Graduation Project

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ABSTRACT

ACKNOWLEDGMENT

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1 INTRODUCTION

1.1 Background of the Study

As the world is moving towards globalizing, effective time management is becoming very important. Considering how everything seems to be rushing in today's world, there is a high requirement for an effective user-friendly time management tool. Paper-based calendars have been used for addressing the complexities of managing multiple schedules across various aspects of life such as work, school, and personal commitments. However, they often fall short in providing a comprehensive solution to modern scheduling challenges.

The introduction of the digital calendar has somewhat solved this problem but still, users face a lot of issues in keeping their calendars up-to-date and synchronized. There are still few people that manually input events into their calendars. This could be really tiring, especially when dealing with multiple calendars.

Moreover, the rise of instant messaging platforms like WhatsApp has changed the way we communicate and plan events. Mostly, important dates and appointments are discussed informally leading to a disconnect between where the information is initially shared and where it needs to be recorded for effective time management.

To address these challenges, we are planning an application called *Muwaqqit*, which aims to revolutionize how people manage their time and schedules in the digital age.

1.2 Problem Statement

Users often face challenges in keeping their calendars up-to-date, particularly when dealing with information from various sources, including informal communication mediums like WhatsApp. The process of manually adding events to the calendar is both time-consuming and prone to errors. Additionally, managing multiple calendars—such as those for work, school, and personal life—creates further complexity and increases the risk of scheduling conflicts. The lack of seamless integration with popular communication platforms exacerbates the problem, leading to a higher likelihood of missing important events due to the scattered distribution of information across different calendars and data sources.

1.3 Objectives of the Study

The main objectives of Muwaqqit are:

- To develop an intelligent calendar management system that automatically extracts

events from the communication channels and adds them to the user's main calendar.

- To create a user friendly interface that allows users to automatically add events to the calendar.

- To implement smart resolution system that notifies users of scheduling conflicts and provides easy options for resolution.

- To integrate all the calendars into Muwaqqit's single calendar view to make viewing and managing all the events easy.

- To prioritize and automatically schedule daily routines such as waking time, sleeping time and prayer time.

- To significantly reduce the time users spend on manual calendar management.

1.4 Research Questions and/or Hypothesis

1.5 Scope of the Study

Muwaqqit is not just another calendar application; it's a comprehensive time management tool designed to aggregate and optimize your existing calendars and data sources. The scope of the project includes:

- Development of an iOS application as the primary platform.

- Integration with calendars using CalDAV.

- WhatsApp message parsing for event extraction (subject to technical feasibility).

- Target audience: Busy professionals, students, and anyone juggling multiple schedules.

- User testing phase to ensure ease of use and effectiveness.

Our testing methods will include:

- Beta testing with a diverse group of users.

- Analytics to track user behavior and app performance.

1.6 Significance of the Study

Muwaqqit endeavours to solve problems and its significance can be summarized in the following:

1. **Time is Money**: Time is the only asset you can't get more of, it is being consumed til the last day of your life.

2. **Prayer First Calendar**: Prayer times come first, then your daily scheduled items.

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3. **Streamlined Time Management**: By automatically extracting events from various communication channels, Muwaqqit significantly reduces the time and effort required for manual calendar management, allowing users to focus on more productive tasks.

4. **Reduced Human Error**: Automated event extraction and addition to calendars minimize the risk of missing important events or appointments due to manual input errors or forgetfulness.

5. **Integrated Communication and Scheduling**: By bridging the gap between informal communication (e.g., WhatsApp) and formal scheduling, Muwaqqit addresses a critical pain point in modern time management.

6. **Conflict Resolution**: The smart resolution system helps users identify and resolve scheduling conflicts efficiently, reducing stress and improving overall time management.

7. **Holistic View of Commitments**: By integrating multiple calendars into a single view, Muwaqqit provides users with a comprehensive overview of their commitments across various aspects of life, facilitating better decision-making and work-life balance.

1.7 Limitations of the Study

Nothing is perfect, and our project is not a outlier. The limitations we have figured out about it are as follows:

- WhatsApp integration allows the app to read the users messages, so it would be hard to prove privacy hasn't been breached.

- WhatsApp integration might not always be there, they are a third-party.

- Learning new technologies for iOS development might require more time than anticipated.

- Accuracy of our algorithms to detect keywords indicating an event agreement has happened, especially for languages other than English.

- Time and manpower constraints may limit the number of features we can implement.

- Dependency on third-party calendar APIs and their limitations.

1.8 Organization of the Senior Project

Our project plan can be illustrated in the following gantt chart, **Figure 1.1**.
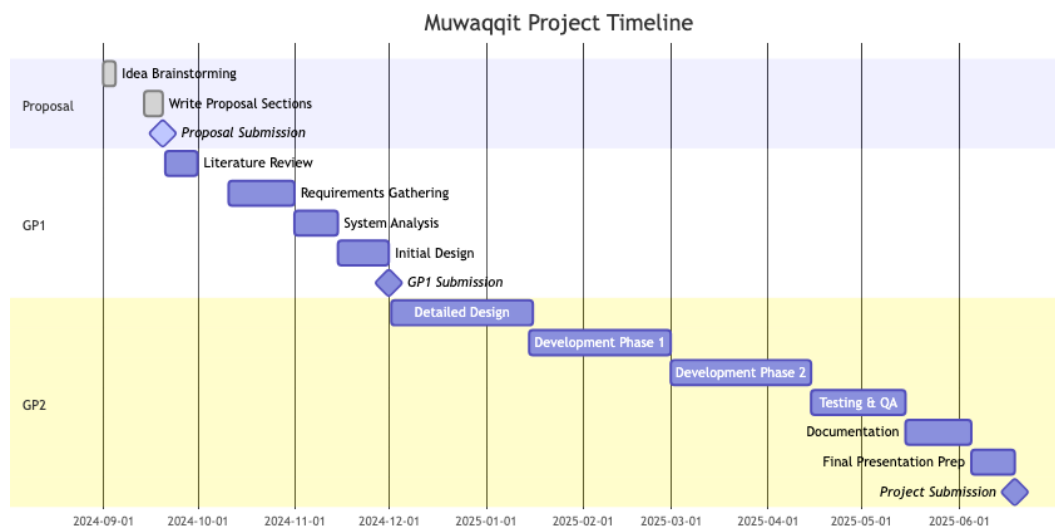
Figure 1.1: Project Gantt Chart

2 LITERATURE REVIEW

In developing Muwaqqit, we have drawn inspiration from and built upon existing research and products in the field of intelligent calendar management. Some key references include:

- **Clockwise (https://www.getclockwise.com/):** A smart calendar assistant that optimizes schedules and manages team coordination [Clockwise, 2024]. Clockwise's approach to intelligent time blocking and meeting optimization provides valuable insights for Muwaqqit's automated scheduling features.

- **Motion (https://www.usemotion.com/):** Motion's Intelligent Calendar takes your meetings, your tasks, your to-do list, your activities, and creates one perfect, optimized schedule to get it all done [Motion, 2024].

- **Reclaim AI (https://reclaim.ai/):** An intelligent time management tool that helps optimize schedules and automate tasks [Reclaim, 2024].

- **Calendi (https://calendi.ai/):** Calendi describes itself as: "Calendi is an AI calendar system. Use it for scheduling tasks, automating meetings, and witness the future of calendar." [Calendi, 2024]

- **An Exploratory Study of Calendar Use:** "Prospective remembering is the use of memory for remembering to do things in the future, as different from retrospective memory functions such as recalling past events." [Tungare et al., 2008]

- **WhatsApp Integration:** Our research indicates that direct WhatsApp integration for event extraction has not been widely implemented in existing calendar applications, making this a unique feature of Muwaqqit.

Feature	Muwaqqit	Clockwise	Motion	Reclaim AI	Calendi
Open Source	✅	❌	❌	❌	❌
WhatsApp Integration	✅	❌	❌	❌	❌
CalDAV Support	✅	✅	✅	✅	?
Conflict Resolution	✅	✅	✅	✅	?
Prioritize Prayer Times	✅	❌	❌	❌	❌
iOS Application	✅	✅	✅	✅	?

Figure 2.1: Feature Comparison Table

3 SYSTEM ANALYSIS AND DESIGN

3.1 Functional Requirements

- The user shall be able to access their account using either Google or Email.

- The user should receive a welcome emil if they are a new user.

- The user should be able to connect a calendar using CalDAV.

- The user should be able to connect their WhatsApp account.

- The user should be able to add events manually and set priorities optionally.

- The user should be able to view integrated calendar.

- The user should be able to configure daily routines.

- The user should be able to manage scheduling conflicts.

- The user should be able to schedule prayer times.

- The user should be able to receive event notifications.

- The user should be able to have a personalized experience by being asked questions.

- The user should be able to see events he agreed with people on in WhatsApp in the calendar, and if a conflicst arises, he can fix it through a notification.

3.2 Non-Functional Requirements

- The app should run on iOS only.

- The system should be fast and efficient.

- The app should have good user experience, and be easy to use.

3.3 System use-cases

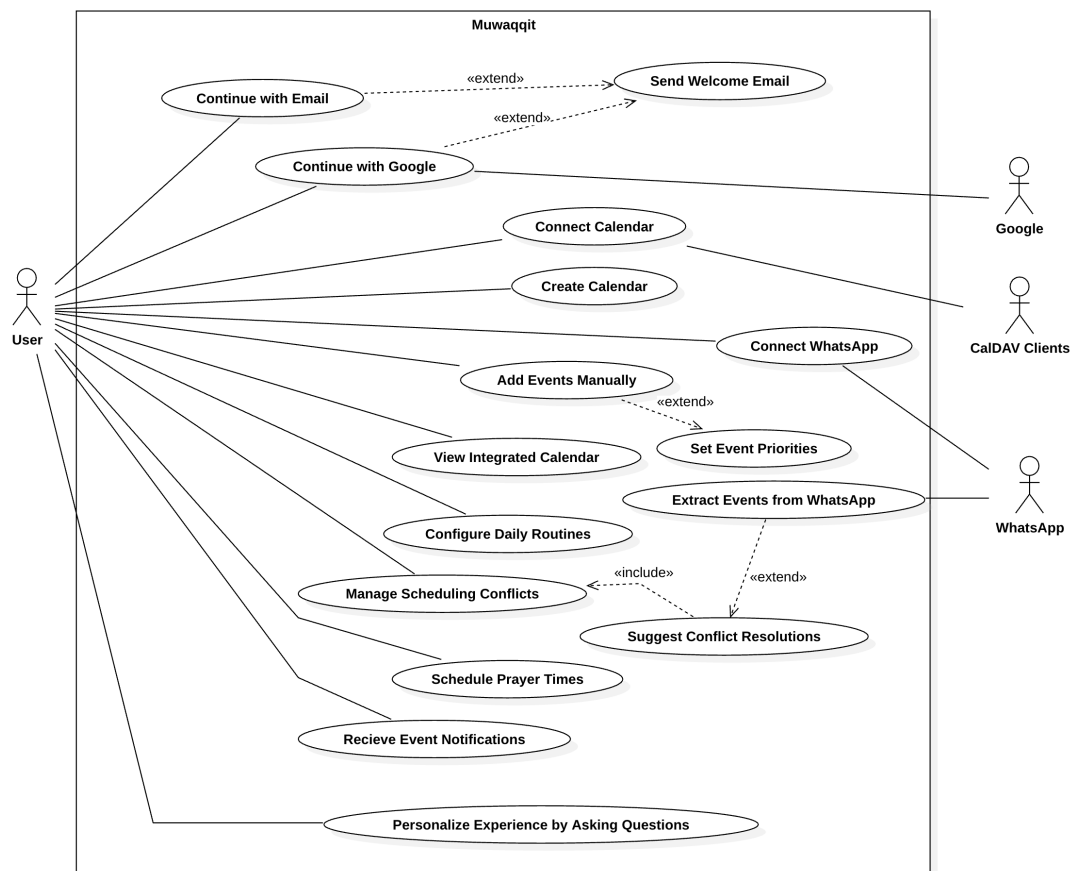**Figure 3.1** shows the use case diagram for the system of Muwaqqit.

Figure 3.1: Use Case Diagram of Muwaqqit

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[Tungare et al., 2008] Tungare, M., Perez-Quinones, M., and Sams, A. (2008). An exploratory study of calendar use.