

Automatic Time Management System (ATOMS)

CS 3337 Software Engineering

Application Requirements Specification Document

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Table of Contents

<i>Section Number</i>	<i>Section Name</i>	<i>Page Number</i>
0.0	Document Revision History	<u>3</u>
1.0	Introduction	<u>4</u>
1.1	Purpose	<u>4</u>
1.2	Intended Audience and Reading Suggestions	<u>4</u>
1.3	Product Scope	<u>4</u>
1.4	Definitions, Acronyms, and Abbreviations	<u>4</u>
1.5	References	<u>5</u>
2.0	Overall Description	<u>6</u>
2.1	Product Perspective	<u>6</u>
2.2	Product Functions	<u>6</u>
2.2.1	DFD - 1	<u>7</u>
2.3	User Classes and Characteristics	<u>7</u>
2.4	Operating Environment	<u>7</u>
2.5	Design and Implementation Restrains	<u>8</u>
2.6	User Documentation	<u>8</u>
2.7	Assumptions and Dependencies	<u>8</u>
2.8	Apportioning of Requirements	<u>8</u>
3.0	External Interface Requirements	<u>8</u>
3.1	User Interfaces	<u>8</u>
3.2	Hardware Interfaces	<u>8</u>
3.3	Software Interfaces	<u>9</u>
3.4	Communications Interfaces	<u>9</u>
4.0	Requirements Specification Per Module	<u>10</u>
4.1	External Interface Requirements	<u>13</u>
4.2	Logical Database Requirements	<u>13</u>
4.3	Design Constraints	<u>13</u>
5.0	Other Nonfunctional Requirements	<u>13</u>
5.1	Performance Requirements	<u>14</u>
5.2	Safety Requirements	<u>14</u>
5.3	Security Requirements	<u>14</u>
5.4	Software Quality Attributes	<u>14</u>
5.5	Business Rules	<u>14</u>
6.0	Other Requirements	<u>14</u>

Document Revision History

<i>Version #</i>	<i>Revision Author</i>	<i>Revision Summary</i>	<i>Revision Date</i>
0.1	Austin Vargason	Initial Draft	2/23/19
0.2	Austin Vargason	Meeting Template Requirements	3/9/19
0.3	Carlos Gomez	Added Performance and Safety Requirements	3/13/19
0.4	Austin Vargason	Completed Section 2 and 3	3/14/19
0.5 - 0.7	Austin Vargason	Completed Initial Document Submission	3/15/19
0.8	Austin Vargason	Cleanup of Requirements	3/24/19
0.9	Carlos Gomez, Micky Chan, Austin Vargason, Montague LaFrance	Document Review and DFD addition	3/30/19

1.0 Introduction

This document seeks to outline the software requirements for the Automatic Time Management System (ATOMS) android application. ATOMS is an Android Application that helps the user automatically manage their time. The ATOMS application allows users to schedule projects, assignments, goals, or other activities around their current schedule. ATOMS allow users to integrate their existing Google Calendar data, which creates an intuitive scheduling experience. The goal of the ATOMS development team is to improve time management and reduce stress for our users.

1.1 Purpose

This SRS document version 0.6 contains specifics for the ATOMS application for Android. In this document, the overall description of the product, as well as the product's functional, interface, design, and, security, and safety requirements will be outlined. The architects involved in the completion of the ATOMS project shall use this document to create an overall Solution Design Document (SDD).

1.2 Intended Audience and Reading Suggestion

This document is intended to be viewed by developers and architects involved with the ATOMS application to fully understand the requirements of the application and the interfaces it presents. This document may also be viewed by third-parties under the scope of product presentations.

1.3 Product Scope

The scope of the ATOMS application is Android Users on operating systems at or above: Android version 7.1.

1.4 Definitions and Acronyms

Android Studio: Development environment to develop Android Applications

Java: Object Oriented Programming Language

GUI: Graphical User Interface

ATOMS: Automatic Time Management System

API: Application Programming Interface

OS: Operating System

XML: extensible markup language

Strictly Scheduled Event: A calendar event that has a pre-defined start and end time

Automatically Scheduled Event: A calendar event scheduled by the defined ATOMS algorithm

1.5 References

- 1.5.1 Google Sign-In and Google Play Services Authentication
Author: Google
Version Number: 16.0.1
Source: <https://developers.google.com/identity/sign-in/android/start-integrating>
- 1.5.2 Android Calendar Provider
Author: Google
Version Number: n/a
Source: <https://developer.android.com/guide/topics/providers/calendar-provider>
- 1.5.3 Google OAuth Client
Author: Google
Version: 1.23.0
Source: <https://developers.google.com/api-client-library/java/google-oauth-java-client/>
- 1.5.4 Firebase Application Integration
Author: Google
Version: 16.0.8
Source: <https://firebase.google.com/docs/android/setup>
- 1.5.4 Google Code Labs for Android Development
Author: Google
Source: <https://codelabs.developers.google.com/android-training/>
- 1.5.5 Android Studio Documentation
Author: Google
Source: <https://developer.android.com/studio/intro>

2.0 Overall Description

The ATOMS application has been conceived as an Android application for use on Android phones at or above OS level 7.1. The ATOMS application establishes a connection to the user's Google account through an initial sign in screen the first time the app is launched. Once logged in, the user will be taken to a screen showing the user's events for today's date with a floating action button in the bottom corner. The floating action button gives the user to add auto-scheduled events to their calendar, or strict events (those events with a defined start and end time). The main screen will also have an options button that will allow the user to change the theme of the app as well as sign out, switch user accounts, or change the calendar view to a daily, weekly or monthly view. The user may also use gesture controls (swipe left, or right) to navigate throughout their calendar.

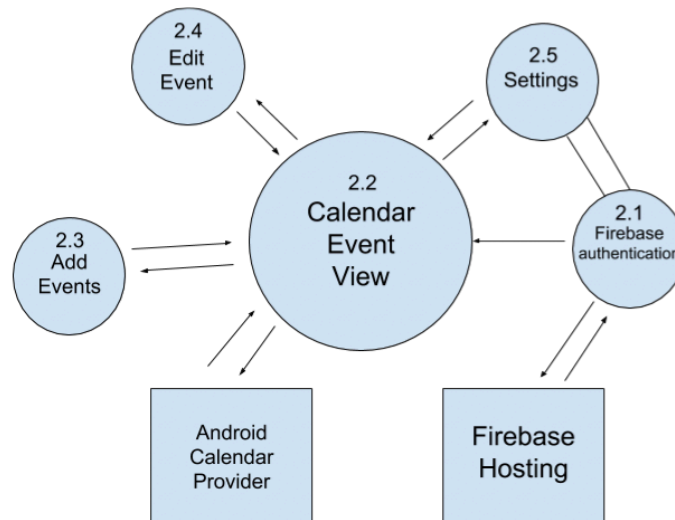
2.1 Product Perspective

Many applications have designed for the task of time Management, but many of them feel unintuitive and require too much effort to justify consistent use. The ATOMS development team has the perspective that the ATOMS application can be a powerful time management tool that is also easy to use.

2.2 Product Functions

- **Login:** User is able to log in through their Google Account
- **Calendar Views:** Presents the choice of Daily, Weekly, or Monthly Calendar View
- **Adding Events:** The user may add a strictly scheduled event or an automatically scheduled event
- **Theme Options:** The user shall have the ability to change the color theme of the app
- **Gesture View Switching:** The user shall have the ability to use a swipe-left or swipe-right gesture to switch to the next day, week, or month's events depending on the current view provided
- **Account Switching:** The user may have the ability to switch the user account through an option in the options menu
- **Data Backup:** All calendar changes shall be applied to the user's Google calendar data. If the user chooses to undo their changes, the user may have the ability to undo the previous added event or go back to their original calendar import.

2.2.1 DFD-1



2.3 User Classes and Characteristics

- General Assumptions:
 - Technical Expertise: Basic Smartphone Usage
- Business Professionals:
 - Frequency of Use: High
 - Characteristics: Uses ATOMS with business meetings present in Google Calendar and uses ATOMS scheduling abilities to schedule project workloads or deadlines
- Students:
 - Frequency of Use: High
 - Characteristics: Uses ATOMS with classes present in Google Calendar and Uses ATOMS scheduling abilities to schedule workloads for assignments and studying.
- General Consumer:
 - Frequency of Use: Medium
 - Characteristics: Uses ATOMS with general meetings or events present in Google Calendar and uses ATOMS scheduling abilities to schedule out chores, work, or general day to day tasks.

2.4 Operating Environment

The ATOMS application requires Android version 7.1 and above.

2.5 Design and Implementation Restraints

- Hardware Limitations:
 - Limited to Android devices
- Memory Constraints
- Capabilities of Google APIs

2.6 User Documentation

- Help documentation present in ATOMS application

2.7 Assumptions and Dependencies

- API Dependencies: Google Calendar and Google Sign In
- This application uses a minimum API version of Android in order to support as many devices as possible as presented in [2.4 Operating Environment](#)

2.8 Apportioning of Requirements

- User Theme Creation: Would allow users to define a custom theme for the application instead of choosing a preselected theme.
- Account Switching: Allows Users to switch accounts in the application if using multiple email accounts
- Undo: Ability to undo a previously submitted change to the User's calendar in scheduling.

3.0 External Interface Requirements

3.1 User Interfaces

User Interface described in detail in section [4.0](#) per module.

3.2 Hardware Interfaces

The supported hardware are devices that run Android version 7.1 and later.

3.3 Software Interfaces

3.3.1 Google Sign-In and Google Play Services Authentication

Author: Google

Version Number: 16.0.1

Source: <https://developers.google.com/identity/sign-in/android/start-integrating>

3.3.2 Android Calendar Provider

Author: Google

Version Number: n/a

Source: <https://developer.android.com/guide/topics/providers/calendar-provider>

3.3.3 Google OAuth Client

Author: Google

Version: 1.23.0

Source: <https://developers.google.com/api-client-library/java/google-oauth-java-client/>

3.3.4 Firebase Application Integration

Author: Google

Version: 16.0.8

Source: <https://firebase.google.com/docs/android/setup>

3.4 Communication Interfaces

- Google Sign In is handled through Google Play Services API
- Google Calendar and Oath work through Google's REST API communication methods

4.0 Requirements Specification Per Module

Those requirements represented using the language “shall” will be implemented into the final application. Those using the language “may” should only be implemented given that time restraints permit. The Requirements in this section shall be split into the following modules: Firebase Authentication, Calendar Event View, Add Events, Edit Events, and Settings

Module 2.1: Firebase Authentication

<i>Requirement Number</i>	<i>Requirement Description</i>
4.0.2.1.1	The login screen shall be presented to the user when previous authentication is not present
4.0.2.1.2	The login screen shall present a button to login with Google Sign In, this will redirect the user to the standard google sign in screen as Implemented in the API
4.0.2.1.3	The login screen shall only redirect to the main app upon proper retrieval of a Google Authentication
4.0.2.1.4	The Login Screen shall use Google Sign-In for a Firebase Authentication to keep track of online storage for users
4.0.2.1.5	The main app screen shall present the user with the day’s current calendar event (see section 4.1 for functional specifics)
4.0.2.1.6	The login screen shall present the ATOMS logo at the top of the layout

Module 2.2: Calendar Event View

<i>Requirement Number</i>	<i>Requirement Description</i>
4.0.2.2.1	The center of the main app screen shall consist of card views, each representing a calendar event.
4.0.2.2.2	Each card view shall be color-coded based on the priority of the event.
4.0.2.2.3	The default view for events on the main screen shall be the daily view.
4.0.2.2.4	The main app screen shall have an easily accessible floating action button in the right corner of the screen to add a new event to the current view (dynamically scheduled, or statically scheduled).
4.0.2.2.5	The main app screen shall have a settings menu in the upper right-hand corner of the screen presenting the items: “Settings”, and “Log Out”
4.0.2.2.6	The main app screen shall be easily navigable and scroll when necessary.
4.0.2.2.7	Calendar events shall be loaded upon load of the main app screen and upon submission of a new calendar event.
4.0.2.2.8	The main app screen shall consist of sidebar that presenting the view choice items: “Daily”, “Weekly”, and “Monthly”.
4.0.2.2.9	Event views shall update the main screen to a new view type (weekly, monthly, daily).
4.0.2.2.10	The main app screen’s sidebar shall present predefined theme choice options to be specified in the SDD.
4.0.2.2.11	The user shall be notified that changes in the app to calendar events will affect their underlying Google Calendar through the Android Calendar Provider.
4.0.2.2.12	The Floating Action Button on the main app screen shall redirect to the Add Events module.
4.0.2.2.13	The Settings menu item “Settings” shall redirect to the Software Settings Module
4.0.2.2.14	A long press of an Event on the main module screen shall redirect to the Edit Event Module

Module 2.3: Add Events Module

<i>Requirement Number</i>	<i>Requirement Description</i>
4.0.2.3.1	The Add Events module shall be launched upon selection of the floating action button in the Main Module.
4.0.2.3.2	The Add Events module's UI shall present a form to the User to gather information about an event that will be added to the Main Module.
4.0.2.3.3	The form specified in requirement: 4.0.22 shall contain a dropdown box to select a Calendar Event type ("auto-scheduled" or "standard").
4.0.2.3.4	The form specified in requirement: 4.0.22 shall be dynamically updated based on the dropdown box item selection.
4.0.2.3.5	The form generated for "auto-scheduled" events shall consist of form options to gather: The event priority on a scale of 1-10 (1 being the highest), when the event should start being scheduled, when the event should be completed by, and the estimated number of hours to complete the event.
4.0.2.3.6	The form generated for "standard" events shall consist of form options to gather: the event start time, the event end time, whether it repeats (if the event repeats the user shall enter the days for which it repeats and when the repetition ends), and the event priority on a scale of 1-10 (1 being the highest).
4.0.2.3.7	"auto-scheduled" events shall be handled by the Add Events module and a schedule shall be generated then outputted to the main module, given the user's current calendar.
4.0.2.3.8	"standard" events shall be handled by the Add Events module and added to the Main Module given the user's input.

Module 2.4: Edit Events Module

<i>Requirement Number</i>	<i>Requirement Description</i>
4.0.2.4.1	The Edit Events module shall be launched upon a press of a calendar event in the main module
4.0.2.4.2	The Edit Events Module shall take the long-held event as input into a form where event properties shall be edited.
4.0.2.4.3	The form specified in requirement: 4.0.22 shall contain all the properties of the event (start time, end time, title, priority, and repetitions) that shall be edited.
4.0.2.4.4	Upon submission of the updated event data, the event shall be updated and outputted to the main module.

Module 2.5: Settings Module

<i>Requirement Number</i>	<i>Requirement Description</i>
4.0.2.5.1	The settings module shall be launched upon selection of the settings menu item: “Settings”.
4.0.2.5.2	The Settings Module shall present settings for the app including: App Theme, Time Format, and Date Format.
4.0.2.5.3	User settings shall be saved and outputted to firebase save data.
4.0.2.5.4	Theme selections shall consist of predefined app themes and update the general color theme of the app accordingly.
4.0.2.5.5	Time format options shall update the displayed time format of events in the main module.
4.0.2.5.6	Date Format options shall update the date format (start of the week, general date display format) in the main module.

4.1 External Interfaces Requirements

<i>Requirement Number</i>	<i>Requirement Description</i>
4.1.1	The ATOMS application shall interface with Firebase for storing user Google Accounts and settings.
4.1.2	The ATOMS application shall interface with Google Sign In.
4.1.3	The ATOMS application shall interface with the Android Calendar Provider to deal with user’s calendar data.

4.2 Logical Database Requirements

<i>Requirement Number</i>	<i>Requirement Description</i>
4.2.1	Firebase online database shall store user’s settings preferences based on a user id.
4.2.2	Firebase online user storage shall store all previously authenticated user’s to ATOMS and when they last logged in.

4.3 Design Constraints

- **OS Level Constraints:** Operating system must be a supported Android Version
- **Google Calendar Access:** The system may be limited on the access level of private Calendar events depending on previous OAuth
- **Hardware Level Constraints:** Hardware was support newer level Android operating systems, OS updates may depend on carrier / phone manufacturer.
- **Invalid Event Requests:** The system may be unable to create dynamically scheduled events if the user’s calendar is already full to beyond reason.

5.0 Other Nonfunctional Requirements

5.1 Performance Requirements

- The ATOMS application shall perform its functions within a 2 second timeframe and support a single user using their Google Calendar credentials.
- The ATOMS application will process multiple instances of dates and strings obtained through the user's Google account.

5.2 Safety Requirements

- The ATOMS application will be used on an Android device, which may cause eye strain after prolonged use.
- Potentially, the original order of the Google Calendar events may be lost after several iterations of the reorganization feature. To prevent this, the number of times ATOMS uploads to the user's original Google Calendar is limited and requires the user's authorization.

5.3 Security Requirements

- Google Password Data shall not be accessible at any time in plaintext data
- When dealing with account data, all transactions will be handled using Google OAuth
- Calendar Events shall only be editable by the creator of the event

5.4 Software Quality Attributes

- The app shall remain free of crashes and data loss due to app misbehavior
- The app shall maintain quality in terms of meeting the requirements specified in this SRS document
- The app shall be modular in its design and create easily editable source code, using well-defined software design patterns when necessary

5.5 Business Rules

- Any user of the application shall only be able to access those calendar events accessible after Google Authentication
- Only a standard user level shall exist of application privileges. No admin or service level rights shall be defined.

6.0 Other Requirements

- At no point may ATOMS development team be able to access user's calendar data. Only the logged in user may access their calendar data

Appendix A: Glossary

Refer to section 1.4 of section 1.

Appendix B: Analysis Models

This project did not use any analysis models.

Appendix C: To Be Determined List

This project does not intend to use any new references.