SOFTWARE REQUIREMENTS SPECIFICATION

Galaxy Wearable app (For Galaxy Buds+)

Version 1.0

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CMPT 376W Project

Contents

1 Introduction

1.1 Purpose

- To connect Galaxy Buds+ to a mobile device, the users must install the Galaxy Wearable app on their mobile device. Using the Galaxy Wearable app, users can view the Galaxy Buds+ status and customize their settings. The purpose of this document is to build the Galaxy Wearable app. This is the vision 1.0, and this document include introduction, overall description, system features, external interface requirements and nonfunctional requirements.

1.2 Document Conventions

- Bold fonts for emphasizing.

1.3 Intended Audience and Reading Suggestions

- This document is useful for both software development team and users. The rest of this document contains overall description, system features, external interface requirements and nonfunctional requirements. Suggest all readers read this document form beginning to end, step by step.

1.4 Project Scope

- The purpose of Galaxy Wearable app is to build a smartphone app to help Galaxy Buds+'s user easier manage their Galaxy Buds+, such as see the battery level, adjust the ambient sound, adjust the equalizer, manage notifications, change the functions of touchpad, find earbuds and earbuds software update, etc. The users will have better experience using their Galaxy Buds+ with this app.

1.5 References

- https://github.com/jpeisenbarth/SRS-Tex/blob/master/srs.tex.

- https://krazytech.com/projects/sample-software-requirements-specificationsrs-report-airline-database

- https://www.samsung.com/uk/support/mobile-devices/how-do-i-pair-and-set-up-my-galaxy-buds/

- https://www.cnet.com/how-to/master-samsungs-galaxy-buds-plus-with-these-tips-and-tricks/

- https://mobilesyrup.com/2019/01/07/samsung-one-ui-usability-visual-comfort/

- https://www.samsung.com/us/support/owners/app/galaxy-wearable-watch

- http://downloadcenter.samsung.com/content/UM/202003/20200306091703477/R175_-UG_CA_ENG_D2.pdf

2 Overall Description

2.1 Product Perspective

- Galaxy Wearable app for Galaxy Buds+ is a member of the whole Galaxy Wearable app, which also include Galaxy Watch, Galaxy Fit/Fit e, Galaxy Watch Active/Active 2 and Galaxy Buds, etc. The Galaxy Wearable app helps user manage all their Galaxy wearable devices better and easier.

2.2 Product Functions

1. Battery level for earbuds and case

2. Ambient sound
   - Set the earbuds to hear surroundings clearly while user are listening to music outdoors and control the ambient sound volume depending on the situation or place.

3. Equalizer
   - Select an equalizer preset user want to use.

4. Notifications
   - User will receive notifications from the mobile device's apps via the earbuds.

5. Touchpad
   - Change the touchpad usage settings.

6. Advanced
   - Activate the advanced sound features for earbuds.

7. Find My Earbuds
   - If user misplace earbuds, use the Galaxy Wearable app on mobile device to find it.

8. General
   - Reset earbuds

9. Earbuds software update
   - Update earbuds' software via the firmware over-the-air (FOTA) service.

10. Tips and user manual
    - View how to use the Galaxy Buds+.

11. Labs
    Check out experimental features.

12. About earbuds
    - View the information of the Galaxy Buds+.

2.3 User Classes and Characteristics

- All Galaxy Buds+ user should have the same access to this app.

2.4 Operating Environment

- Android
    - Android OS 5.0 and above
    - RAM 1.5GB and above
    - Permissions
        * Location: Used to search for nearby devices through Bluetooth
        * Storage: Used to transmit and receive the stored files
        * Telephone: Used to check device-unique identification information for updating apps and installing plug-in apps
- iOS
    - iOS 10.0 and above
    - iPhone 7 and above

2.5 Design and Implementation Constraints

1. Operation system: Android and iOS

2. Database: SQLite database

3. Language: Java(Android) and Swift(iOS)

2.6 User Documentation

1. User manual

2. Quick start guide

3. Legal information

4. Online chat

5. Discussion forum

2.7 Assumptions and Dependencies

1. Users' device support Bluetooth.

2. Bluetooth Profiles: A2DP,AVRCP,HFP

3 System Features

3.1 Functional Requirements

1. Battery level
   - Check out the battery level for for both earbuds and case.

2. Ambient sound
   - Set the earbuds to hear surroundings clearly while user are listening to music outdoors and control the ambient sound volume depending on the situation or place.
     - Off
     - Low
     - Medium
     - High

3. Equalizer
   - Select an equalizer preset user want to use.
     - Normal
     - Bass boost
     - Soft
     - Dynamic
     - Clear
     - Treble boost

4. Notifications
   - User will receive notifications from the mobile device's apps via the earbuds.
     - On/Off
     - Read aloud while using phone (On/Off)
       - Set the earbuds to receive notifications from the mobile device even when user are using the mobile device.
     - Apps to get notifications from
       - Select the apps user want to receive notifications from and change the notification settings for each app.

5. Touchpad
   - Change the touchpad usage settings.

   - Tutorial for using touchpad

     - Tap

       * Play or pause track.

     - Double tap

       * Play next track.

       * Answer or end call

     - Triple tap

       * Play previous track.

     - Touch and hold

       * User's choice (change in settings).

       * Decline call.

   - Lock touch pad (On/Off)
     - Lock the earbuds' touchpads. To use the touchpad lock feature, tap the switch to activate it.

   - Touch and hold the touchpad
     - Select a feature to be used as a preset tap-and-hold feature.

     - Left

       * Voice command
         - Active voice assistant (Bixby, Google Assistant, etc.).

       * Ambient sound
         - Turn on/off ambient sound.

       * Volume down

     - Right

       * Voice command
         - Active voice assistant (Bixby, Google Assistant, etc.).

       * Ambient sound
         - Turn on/off ambient sound.

       * Volume up

6. Advanced
   - Activate the advanced sound features for earbuds.

   - Use Ambient sound during calls (On/Off)
     - Activate ambient sound mode during calls.

7. Find My Earbuds
   - If user misplace earbuds, use the Galaxy Wearable app on mobile device to find it.

     - Start/Stop

8. General

   - Reset earbuds
     - User can reset all earbuds settings.

9. Earbuds software update
   - Update earbuds' software via the firmware over-the-air (FOTA) service.

     - Download and install
       - Check for and install updates manually

     - Auto download over Wi-Fi (On/Off)
       - Set the earbuds to download updates automatically when connected to a Wi-Fi network.

     - Last update
       - View the information for the latest software update.

10. Tips and user manual
    - View how to use the Galaxy Buds+.

      - Tutorial
        - Use touchpad
        - Ambient sound
        - Charging with user's phone
        - Case battery level
        - Pairing with a phone or tablet

      - User manual
        - Jump to user manual's website.

11. Labs

    - Double tap earbud edge
      - Double tap the edge of the left earbud to turn the volume down, or the edge of the right earbud to turn the volume up.

    - Extra-high ambient volume
      - Add an extra volume level so user can play ambient sound at a higher than normal volume.

    - Gaming mode
      - Minimize audio delay for vivid, synchronized gaming sound.

12. About earbuds
    - View the information of the Galaxy Buds+.

    - Name
      - Edit Galaxy Buds+'s name

    - Serial number

    - Model number

    - Legal information
      - View the legal information for the Galaxy Buds+.

    - Software information
      - View the earbuds' software information.

    - Battery information
      - Check the earbuds and charging case's battery information.

3.2 Example

3.2.1 Connecting New Device(Samsung)

Use Case Name
 - Connect new device
Trigger
 - The user open the charging case with the buds in it.
Precondition
 - The user's device Bluetooth must be on.
Path

1. Place the earbuds into their corresponding slots in the charging case.
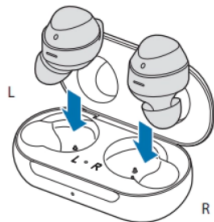
2. Close the charging case.

3. Open the charging case
   (The earbuds will automatically enter pairing mode and a pop-up window will appear on user's device)

4. Tap **Connect** on the pop up window.
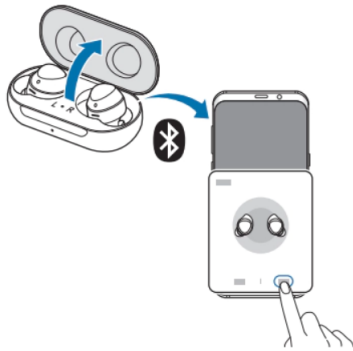
Post-condition

- Once the Galaxy Buds+ have been connected, they will automatically try and connect to user's device every time user open the charging case while the earbuds are inside.

3.2.2 Connecting New Device(non-Samsung)

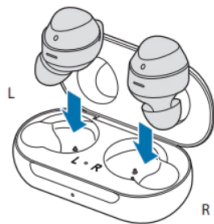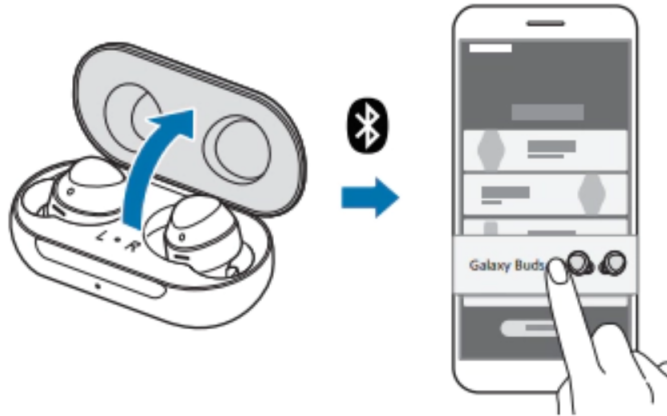**Use Case Name**

- connect new device

Trigger

- The user open the charging case with the buds in it.

Precondition

1. The user's device Bluetooth must be on.

2. The user's device must have the Galaxy Wearable app.

Path

1. Place the earbuds into their corresponding slots in the charging case.

2. Close the charging case.

3. Open the Charging case.
   (The earbuds will automatically enter pairing mode)

4. Open the Galaxy Wearable app and click on Galaxy Buds+

Post-condition

- Once the Galaxy Buds+ have been connected, they will automatically try and connect to user's device every time user open the charging case while the earbuds are inside.

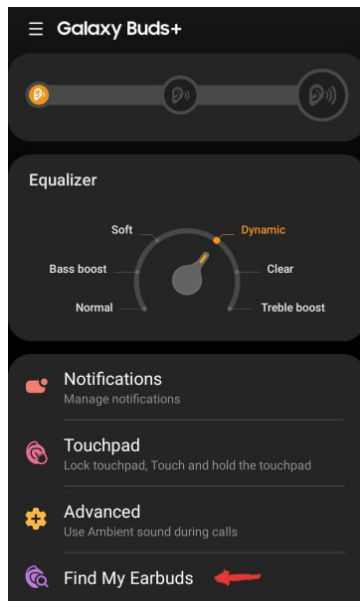### 3.2.3 Find a lost earbud

Use Case Name

- Find My Earbuds

Trigger

- The User click on the Find My Earbuds option in the Galaxy wearable app.
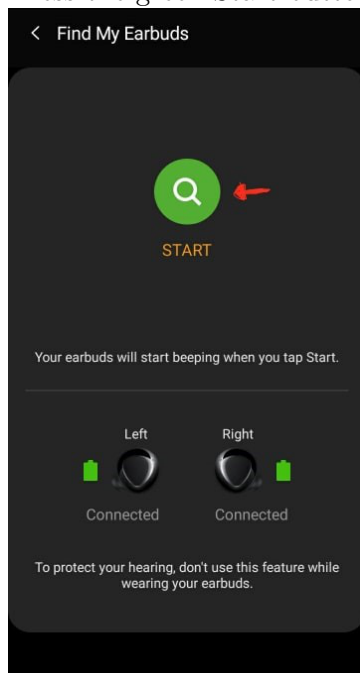
Precondition

- The user's device must be connected to the Galaxy Buds+.

Path

1. Open the Galaxy wearable app and view user's Galaxy Buds+.

2. Select **Find My Earbuds**

3. Press the green Start button

Post-condition

   - Both buds will begin playing a sound, getting louder as it plays, in a bit to help the user find it.

3.2.4 Set up and customize app notifications

Use Case Name
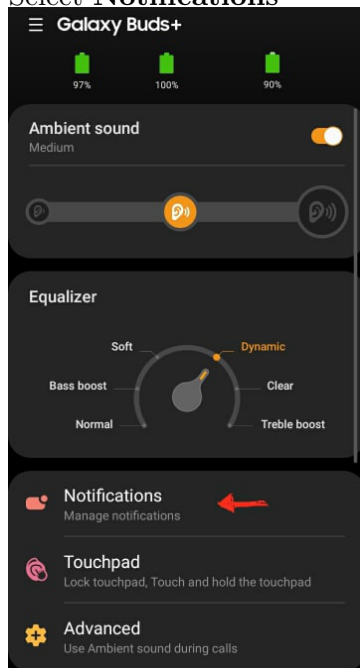 - Notification
Trigger
  - The User click on the Notifications option in the Galaxy wearable app.
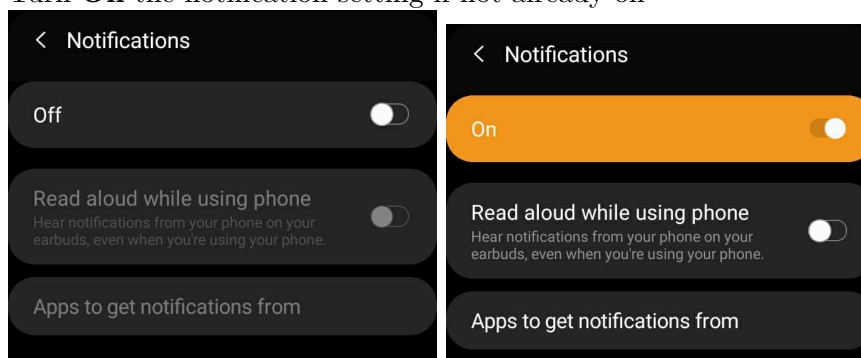**Precondition**
  - The user's device must be connected to the Galaxy Buds+.
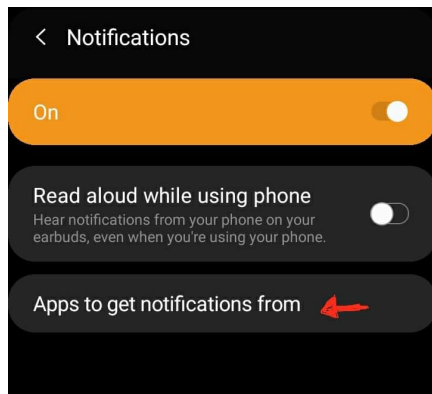**Path**

1. Open the Galaxy wearable app and view user's Galaxy Buds+.
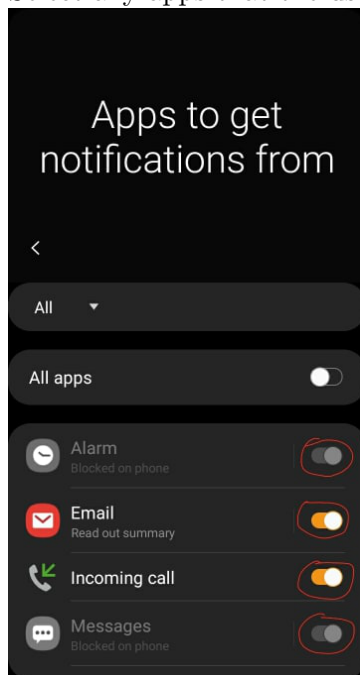
2. Select **Notifications**

3. Turn **On** the notification setting if not already on

4. Select **Apps to get notifications from**

5. Select any apps that the user want to or does not want receive notification

Post-condition

  - The user will receive an alert sound while wearing galaxy buds+, if the user get any notification from the selected apps.

4 External Interface Requirements

4.1 User Interfaces

4.1.1 Front end software

Samsung One UI
  - Split the app in half, upper half is the **Viewing** component and the lower half is the **Interaction** component. In the **Viewing** area will be the space for the user to see the content. In the **Interaction** area will have all the tabs, buttons and other things users interact with - within reach of their thumb.
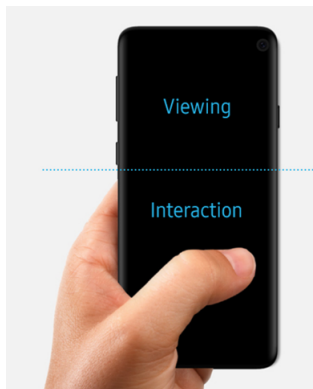
4.1.2 Back end software

SQLite
  - Used to transmit and receive the stored files with device.

4.2 Hardware Interfaces

- Android
- iOS

4.3 Software Interfaces

Following are the software used for the Samsung Galaxy Wearable app.

Software used	Description
Operating system	We have chosen Android and iOS for more customer coverage and user-friendliness.
Database	To transmit and receive the stored files with Gear we have chosen SQLite database.

4.4 Communications Interfaces

- The Samsung Galaxy Wearable app supports all types of devices with Android 5.0 and higher or iOS 10.0 and higher as it operating system.

5 Nonfunctional Requirements

5.1 Performance Requirements

- The app must be interactive and the delays involved must be close to 0. So in every action-response of the app, there are no immediate delays. For accessing the database, to transmit and receive the stored files with device, there should be no delays and the operation is performed in less than 1 seconds. For connecting to the Samsung Galaxy Buds+, the app must performed this action with less than 2 seconds delay, starting as soon as the user input the buds into his/her ears.

5.2 Safety Requirements

- Information transmission should be securely transmitted between the user and server without any changes in information.

5.3 Security Requirements

- The main security concern is that the app has accessed to the user's device database. Hence, proper alert notification should be used to notified the user that the app is connected to Samsung Galaxy Buds+ to avoid hacking. In case, the app is connected to an unknown Samsung Galaxy Buds+, the user must be able to disconnect it immediately with no delays.

5.4 Software Quality Attributes

- **AVAILABILITY:** The app must be available to user all the time, with all of it's features unlock if the user's device is connected to the Samsung Galaxy Buds+.

- **CORRECTNESS:** The app must displayed the right information about the Samsung Galaxy Buds+ that is currently connected to the user's device. When the user change the setting, the app must correctly applied it the Samsung Galaxy Buds+.

- **MAINTAINABILITY:** If the app need any maintenance or update, the user must be able to manually do it through Play Store app. In case the user's device is connected to the Play Store app with their android ID and set the app as automatic update, the app must be able to connect to the server and receive the update by itself.

- **USABILITY:** The app interface must be easy to learn how to use and easy to remember how to use. User should not be required to consult a manual each tie they need to change any setting.