**Android Synchronized Multimedia Integration Language**

**System Requirements Specification (SRS)**

**Version 0.1**

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Executive Overview

The Synchronized Multimedia Integration Language (SMIL) implementation, for the Android platform, seeks to elegantly and seamlessly allow for the creation, distribution, and viewing of SMIL formatted messages. Android SMIL will give the customer an unparalleled ability to create dynamic presentations on a mobile platform and allow them access to their media virtually anywhere via cloud storage.

The **user** objectives for the SMIL are to:

Provide them with powerful mobile tool for creating and viewing presentations.

Enable them to easily add, size, and place media into a presentation.

Allow them to quickly view their presentations.

Allow them to store and access their presentations on the cloud.

Enable them to share their work with other users.

Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | **Version** | **Description** | **Author** |
| 01/28/2012 | 0.1 | Initial Draft. Identified use cases.  Defined Functional Requirements. | Brad Barker |
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# Introduction

The section introduces the system requirements specification (SRS) for the Synchronized Multimedia Integration Language (SMIL) system to its readers.

## Specification Definition

This specification documents the system-level requirements for the SMIL system.

## Specification Objectives

The objectives of this specification of the SMIL are to:

To formally specify:

System overview

Functional requirements.

Non-functional requirements.

## References

This specification references or complies with the following documents:

**SMIL Specification 3.0 W3C:**

W3C’s specifications for the Synchronized Multimedia Integration Language.

Implements, and adheres to core markup elements

**Agile Scrum Conventions:**

Use Case Modeling Guidelines and methodologies.

## Specification Overview

This specification is organized into the following sections:

*Introduction*, describing SMIL and it’s basic functionality to the reader.

*System Overview*, which provides a brief, high level description of the Android SMIL application and it’s interaction between modules.

*Functional Requirements*, which specifies the functional system requirements in terms of a use case model consisting of each external’s use cases and use case paths.

*Non-Functional Requirements*, which specifies the required system factors, accessibility, quality, and security.

# SMIL Overview

This section outlines the high level overview of the Android SMIL application. Defines the interactions between modules and primary objectives.

## Definition

The SMIL application will be a mobile composer and player of SMIL based presentations that can be seamlessly stored on the cloud. The application will give the user the capability to easily create and share media from virtually anywhere.

## User Business Benefits

SMIL will:

Provide its user with a globally accessible cloud storage for their presentations

Give its users the ability to quickly download and play presentations

Enable the user to quickly create a presentation quickly adding text and various media

Enable the user to create a presentation from a template

Enable the user to save their work to the cloud

Provide the user with the ability to share their work with others.

### External Hardware

SMIL interacts, either directly or indirectly, with the following significant external hardware:

**Mobile Device**:

**Android Phone**, for running the application.

**SD Storage,** for locally saving/caching presentations.

**Networking**:

**Internet**, which is the global network used for communication between the cloud and SMIL.

**Google Cloud,** providing WAN storage to facilitate global access.

## SMIL Capabilities

This subsection provides a high-level overview of major capabilities of the GPM. Note that this subsection provides useful information for understanding the following requirements, but does not contain specific testable requirements.

### Summary of System Capabilities

#### User Capabilities

SMIL will provide the following capabilities to our users:

**Editors**. The SMIL will enable users to:

Create a blank presentation

Create a presentation from a template

Edit layout settings

Add, move, and resize text

Add and modify images, audio, and video

Adjust element timing

Save and share presentations

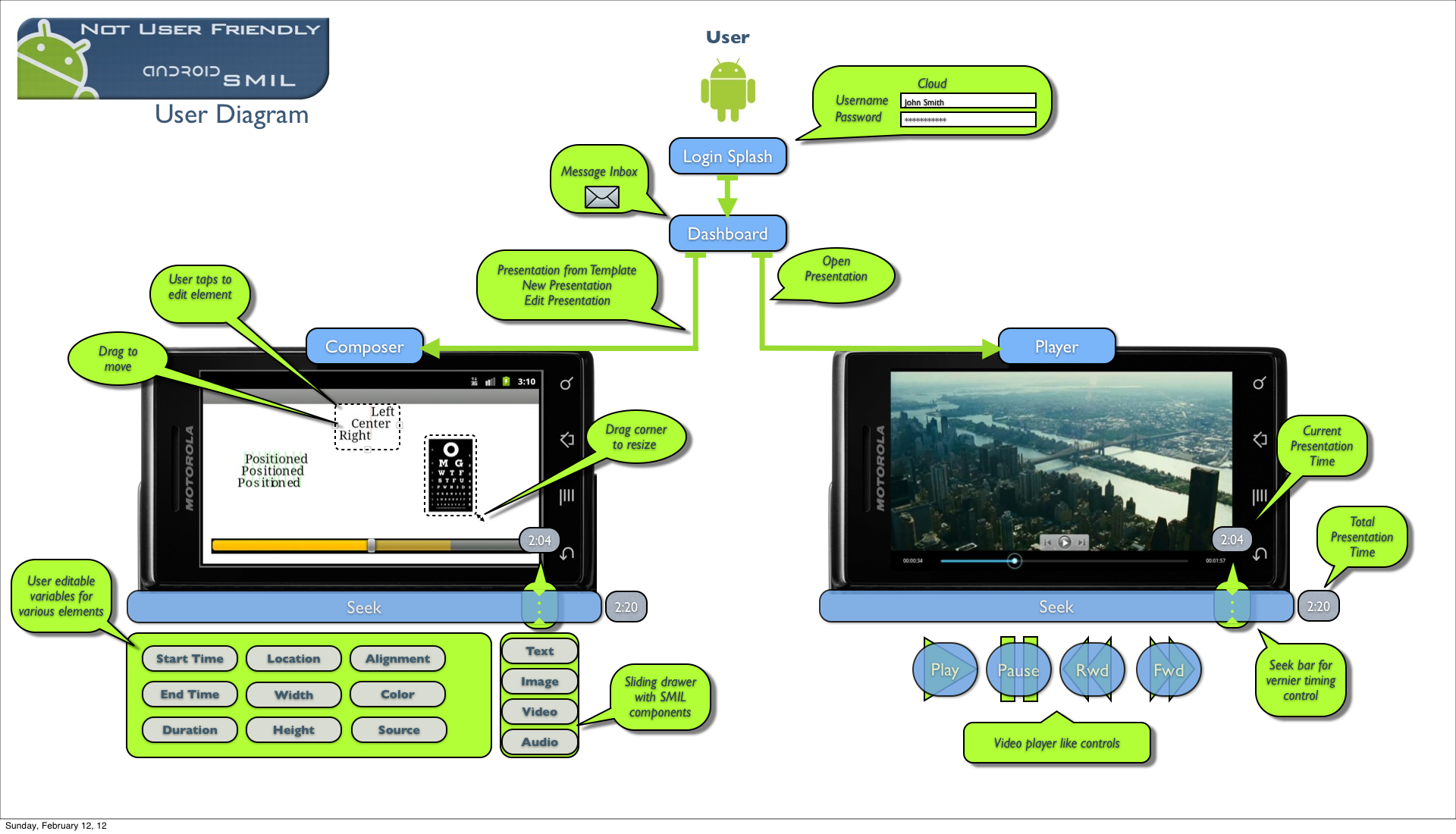
**Viewers**. SMIL presentations will be able to:

Open presentations

Play, pause, and rewind presentations

#### Other Capabilities

**Google Cloud**. SMIL will make use of Google’s Cloud technology to:

Store and retrieve presentations

* Figure 1: User Diagram

# Functional Requirements

The section of the SRS specifies the functional requirements of SMIL in terms of use cases and their associated use case paths.

### User

The subsection specifies the functional requirements primarily associated with users.

Definition

A *user* is the role played by a person who uses SMIL.

Required Capabilities

A user needs the following required technical expertise, experience, and training to effectively interact with GPM:

Use a personal computer to log onto and navigate a user-friendly website.

States

A user can be in the following states:

Login / Home:

Viewing Message

Sending Message

Composing:

Adding Components

Editing Components

Playing:

Playing

Paused

Rewinding / Fast Forwarding

Use Cases

User Login

User sends SMIL message

User views SMIL message

User creates SMIL message

User edits SMIL message

User saves SMIL message

#### Use Case: User Login / Home

Use Case Requirement

The user will login to their account before being taken to the home screen. This will allow the user to enter their Google account credentials that will give them access to their information on the cloud.

Business Justification

Separate user accounts provide accountability and privacy.

Use Case Paths

New Account Created

Account Already Exists

User information invalid

##### Path: New Account Created

Path Requirement

The user will be give the option to create a new user account

Externals

Google Cloud

Preconditions

The initial activity will provide fields for a username and password as well as a link for new user registration

User has a Google Gmail account

Username or email is not already registered

Interactions

* 1. The user clicks the link for “new user registration”
  + 2. The link will forward the user to Google to register their gmail account

Post conditions

The users now has access to the Google cloud interface

Upon returning to the login screen the users Google account credentials will be used for login

Categorization

**Volatility**: Low

**Frequency**: High

**Criticality**: High

**Probability of Defects**: Low

**Risk**: High

# 

##### 3.2.1.2 Path: Account Already Exists

Path Requirement

The user will be prompted with fields to enter a username and password. The user information is valid and has permissions for the cloud

Externals

Google Cloud

Preconditions

The initial activity will provide fields for a username and password

User has a Google Gmail account

Username or email is already registered

Interactions

1. The user will enter their username or email address into the username field
2. The user will then enter their password into a password field
3. The user will then click submit
   1. The Cloud connection will validate the user information with Google
4. The username and password are valid and the login activity will close opening the home screen

Post conditions

The user will then be taken to the home screen

Categorization

**Volatility**: Low

**Frequency**: High

**Criticality**: High

**Probability of Defects**: Low

**Risk**: High

##### 3.2.1.3 Path: User Information Invalid

Path Requirement

The users login email address and/or password are incorrect.

Externals

Google Cloud

Preconditions

The initial activity will provide fields for a username and password

Interactions

1. The user will enter their username or email address into the username field
2. The user will then enter their password into a password field
3. The user will then click submit
   1. The Cloud connection will validate the user information with Google
4. The username and/or password are incorrect and the user will be notified.

Post conditions

The user will remain at the login screen

A message will be displayed to notify the user of the error

Categorization

**Volatility**: Low

**Frequency**: Medium

**Criticality**: High

**Probability of Defects**: Low

**Risk**: High

#### Use Case: User Sends a Message

Use Case Requirement

At the home screen the user will be given their inbox with the option to edit/view/send an existing message or to create a new one. The user will be able to share their message with other users on the cloud

Business Justification

Allows sharing of information while maintaining privacy through user account.

Use Case Paths

User selects recipient and SMIL message

Recipient does not exist

##### 3.2.2.1 Path: User selects recipient and SMIL message

Path Requirement

The user in fact has a SMIL message in their inbox. The intended recipient has a registered account

Externals

Google Cloud

Preconditions

The user has selected a SMIL message

The user has clicked on the send button

Interactions

1. The user will enter the intended recipients email address
2. The user will then click send
   1. The cloud connector will copy the message to the intended users inbox
3. Dialog message will be displayed to verify receipt

Post conditions

The user will be taken back to the inbox

Categorization

**Volatility**: Medium

**Frequency**: Medium

**Criticality**: Medium

**Probability of Defects**: High

**Risk**: Medium

##### 3.2.2.2 Path: User selects recipient and SMIL message

Path Requirement

The user in fact has a SMIL message in their inbox. The intended recipient does not have a registered account.

Externals

Google Cloud

Preconditions

The user has selected a SMIL message

The user has clicked on the send button

Interactions

1. The user will enter the intended recipients email address
2. The user will then click send
   1. The cloud connector will be unable to find recipients inbox
3. Dialog message will be displayed to inform user of the error

Post conditions

The user will be given the chance to correct the email address for the intended recipient.

Categorization

**Volatility**: Medium

**Frequency**: Medium

**Criticality**: Medium

**Probability of Defects**: High

**Risk**: Medium

#### Use Case: User Views a Message

Use Case Requirement

At the home screen the user will be given their inbox with the option to edit/view/send an existing message or to create a new one. The user will be able to open a SMIL message, which will then cause the player activity to open and render their presentation.

Business Justification

Provides the user with the ability to play their presentations.

Use Case Paths

User selects SMIL message to play

User plays / pauses the message

User fast forward or rewinds the message

Closes the message

##### 3.2.3.1 Path: User selects SMIL message to play

Path Requirement

The user does in fact have a SMIL message in their inbox.

Externals

Google Cloud

Local SD Storage

Preconditions

The user has selected a SMIL message

The user has clicked on the view button

Interactions

1. The user has selected a presentation from their inbox to play
   1. The presentation will be retrieved from the cloud and cached locally
   2. The components will be extracted and added to the player window
2. The user will then be shown the player activity
   1. The player will resemble common video players with similar controls
   2. The user will be shown:
      1. Play/Pause button
      2. Fast forward button
      3. Rewind button
      4. Scroll / Seek bar
      5. Current / Total time

Post conditions

The user will then be able to perform paths 3.2.3.2 through 3.2.3.4

Categorization

**Volatility**: Medium

**Frequency**: High

**Criticality**: High

**Probability of Defects**: Medium

**Risk**: Medium

##### 3.2.3.2 Path: User Plays / Pauses the message

Path Requirement

The player has successfully opened and loaded the presentation.

Preconditions

The player has loaded

Interactions

1. The user pressed the play button
   1. The play button icon will change to a pause icon
   2. The timer will begin and the presentation will play
2. The user presses the pause button
   1. The pause button icon will change to a play icon
   2. The timer will pause and the presentation will stop
3. Recursive

Post conditions

The user will be able to continue this path or perform paths 3.2.3.3 and 3.2.3.4

Categorization

**Volatility**: Low

**Frequency**: High

**Criticality**: High

**Probability of Defects**: Medium

**Risk**: Low

##### 3.2.3.3 Path: User FFW / Rewinds the message

Path Requirement

The player has successfully opened and loaded the presentation.

Preconditions

The player has loaded

Interactions

1. The user holds the rewind button
   1. The timer will decrement until the button is released or the timer reaches zero
2. The user holds the fast forward button
   1. The timer will increment until the button is released or the end is reached
3. The user moves the slider/seek bar
   1. The timer will be adjust to the point in which the slider is release

Post conditions

The user will be able to continue this path or perform paths 3.2.3.2 and 3.2.3.4

Categorization

**Volatility**: Low

**Frequency**: High

**Criticality**: High

**Probability of Defects**: Medium

**Risk**: Low

##### 3.2.3.4 Path: User closes the message

Path Requirement

The player has successfully opened and loaded the presentation.

Preconditions

The player has loaded, the user leaves the presentation or application

Interactions

1. The user pressed the close button
   1. The presentation state will be saved in the cache
   2. The player will be destroyed

Post conditions

The user will be taken back to the home screen

Categorization

**Volatility**: Low

**Frequency**: High

**Criticality**: High

**Probability of Defects**: Medium

**Risk**: Low

#### Use Case: User Creates a Message

Use Case Requirement

At the home screen the user will be given their inbox with the option to edit/view/send an existing message or to create a new one. The user will be able to create a new SMIL message from either a template or from scratch. These actions will invoke either an empty composer activity or one containing default elements.

Business Justification

Provides the user with the ability to create presentations.

Use Case Paths

User creates blank message

User creates message from template

##### 3.2.4.1 Path: User creates blank message

Path Requirement

The player has successfully logged.

Preconditions

The home screen is loaded

Interactions

1. The user selects the “New” button
   1. The user selects “new blank presentation” from a list
2. A prompt will allow the user to name the presentation

Post conditions

The composer will open with no current elements

Categorization

**Volatility**: Medium

**Frequency**: Medium

**Criticality**: Medium

**Probability of Defects**: Low

**Risk**: Low

##### 3.2.4.2 Path: User creates message from a template

Path Requirement

The player has successfully logged.

Preconditions

The home screen is loaded

Interactions

1. The user selects the “New” button
   1. The user selects a template from a list
2. A prompt will allow the user to name the presentation

Post conditions

The composer will open with the default elements for the given template elements

Categorization

**Volatility**: Medium

**Frequency**: Medium

**Criticality**: Medium

**Probability of Defects**: Low

**Risk**: Low

#### Use Case: User Edits a Message

Use Case Requirement

At the home screen the user will be given their inbox with the option to edit/view/send an existing message or to create a new one. Once a message has been selected the user will be taken to the composer where the presentation will be loaded for editing

Business Justification

Provides the user with the ability to modify a presentation.

Use Case Paths

User edits the layout

User adds/edits a text field

User adds image

User adds video

User adds audio

User performs player actions

##### 3.2.5.1 Path: User edits the layout

Path Requirement

The user has opened a presentation for editing.

Preconditions

The composer has loaded the presentation

Interactions

1. The user will open the elements dropdown list.
   1. Select the layout item
2. The layout form will open with fields to edit
   1. Background color
   2. Width
   3. Height
3. The user closes the layout form
   1. The composer will re-render the presentation based on the new layout

Post conditions

The composer will reflect the new layout options

Categorization

**Volatility**: Low

**Frequency**: High

**Criticality**: Medium

**Probability of Defects**: Medium

**Risk**: Low

##### 3.2.5.2 Path: User adds/edits a text field

Path Requirement

The user has opened a presentation for editing.

Preconditions

The composer has loaded the presentation

Interactions

1. The user will advance the presentation to the time to add the text
2. The user will open the elements dropdown list.
   1. Select the text item
3. The text form will open with fields to edit
   1. Value
   2. Width
   3. Height
   4. Color
   5. Z-index
   6. Size
   7. Font
   8. Start time
   9. End time
4. The user closes the text form
   1. The composer will add the text field
5. The user can then tap and drag the text field to the desired location
6. Tapping will allow editing of the text field
7. Double tapping will reopen the text form for manual editing

Post conditions

The composer show the new text field

Categorization

**Volatility**: High

**Frequency**: High

**Criticality**: High

**Probability of Defects**: Medium

**Risk**: High

##### 3.2.5.3 Path: User adds image

Path Requirement

The user has opened a presentation for editing.

Preconditions

The composer has loaded the presentation

Interactions

1. The user will advance the presentation to the time to add the image
2. The user will open the elements dropdown list.
   1. Select the image item
3. The image form will open with fields to edit
   1. Source
   2. Width
   3. Height
   4. Z-index
   5. Start time
   6. End time
4. The user closes the image form
   1. The composer will add the image to the current frame
5. The user can then tap and drag the image to the desired location
6. Touching and dragging in the lower right will allow resizing of the image
7. Double tapping will reopen the image form for manual editing

Post conditions

The composer show the new image with the given specifications

Categorization

**Volatility**: High

**Frequency**: High

**Criticality**: High

**Probability of Defects**: Medium

**Risk**: High

##### 3.2.5.4 Path: User adds video

Path Requirement

The user has opened a presentation for editing.

Preconditions

The composer has loaded the presentation

Interactions

1. The user will advance (seek) the presentation to the time to add the video
2. The user will open the elements dropdown list.
   1. Select the video item
3. The video form will open with fields to edit
   1. Source
   2. Width
   3. Height
   4. Z-index
   5. Start time
4. The user closes the video form
   1. The composer will add the video field
5. The user can then tap a drag the video to the desired location
6. Touching and dragging in the lower right will allow resizing of the video
7. Double tapping will reopen the video form for manual editing

Post conditions

The composer show the new video

Categorization

**Volatility**: High

**Frequency**: High

**Criticality**: High

**Probability of Defects**: High

**Risk**: High

##### 3.2.5.5 Path: User adds audio

Path Requirement

The user has opened a presentation for editing.

Preconditions

The composer has loaded the presentation

Interactions

1. The user will advance (seek) the presentation to the time to add the audio
2. The user will open the elements dropdown list.
   1. Select the audio item
3. The audio form will open with fields to edit
   1. Source
   2. Start time
   3. End time
4. The user closes the audio form
   1. The composer will add the audio field
5. Opening the elements menu will show audio components

Post conditions

The composer add the audio file

Categorization

**Volatility**: High

**Frequency**: High

**Criticality**: High

**Probability of Defects**: High

**Risk**: High

##### 3.2.5.6 Path: User performs player actions

Path Requirement

The user has opened a presentation for editing.

Preconditions

The composer has loaded the presentation

Interactions

1. The user will have the same user paths as in case 3.2.3.
   1. The composer is an extension of the player

Post conditions

The composer will render the frame based on the timer allowing editing of the displayed elements

Categorization

**Volatility**: High

**Frequency**: High

**Criticality**: High

**Probability of Defects**: High

**Risk**: High

# System Requirements

This section specifies the required system quality factors that are not related to the specific functional requirements documented in the use case model.

### Timeliness

This subsection specifies the following requirements concerning the degree to which the system must ensure that its persistent information is current (i.e., up-to-date):

SMIL presentations and their associated media files will be stored in Google’s cloud service but upon initial access they will be copied locally to speed up repeat access.

SMIL presentations will also be stored in serialized form to further reduce access time.

## Installation

This subsection specifies the following usability requirements associated with the ease with which the system can be installed.

The SMIL application can easily be installed by adding the APK package to an android device.

The application will additionally require a Google account with privileges to the app engine.

## Interoperability

This subsection specifies the following requirements associated with the ease with which the system can be integrated with other system (e.g., browsers, legacy applications, and required databases).

SMIL will be designed to work with Android versions 2.3.3 and later.

## Integrity

Data integrity between the cloud and the cache must be maintained to minimize loss of information. Cached information will be stored for a limited period of time and the cache will represent a combination of the most recent and most frequently accessed presentations.

* Cache storage
  + Created upon opening a file (if none existent)
  + Contains last 3 presentations to be opened
  + Contains 3 most viewed presentations
  + Contains object serial files for quick restart
  + Synced with cloud when application is closed
* Cloud storage
  + Contains all user files
  + Contains no serialized files
  + Supersedes local files in case of data mismatch
  + Updated on application closed

## Security Requirements

The SMIL application connects to Google’s cloud and authenticates using the uses Google account information. The application will not store or transmit any credentials unencrypted. The application will keep each user’s files in separate buckets and ensure their information remains private from other users.

## Quality

The SMIL implementation will be tested using a combination of automated unit testing and usability testing. The non-user interface components will be tested using JUnit tests. The user interface will be tested through usability testing and evaluation. For thorough testing information refer to the SMIL test plan.