

Stuttherapy : Software requirements specification

Change history

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Introduction

Purpose

The purpose of this document is to describe the software requirements specification of the mobile application *Stuttherapy*. It will describe the applicaiton purpose, its features, its constraints and uses-cases specifications.

The application is developped at UTP as an internship project, this document is intended for everyone who continue the development of *Stuttherapy*.

Scope

Stuttherapy is a mobile application developed for Android and ideally on iOS devices. Its purpose is to help stuttered people to reduce their stuttering with exercises and guides about stuttering. A therapist will be able to access to the exercises results and progressions of his patients.

Definitions, acronyms, and abbreviations

Term	Definition
Stutter	(<i>Wikipedia</i>) speech disorder in which the flow of speech is disrupted by involuntary repetitions and prolongations of sounds, syllables, words or phrases as well as involuntary silent pauses or blocks in which the person who stutters is unable to produce sounds.
(speech) therapist	Clinican user specilised in the audiology, behavior analysis, optometry, occupational therapy, clinical psychology, physical therapy, special education fields to help stuttered users.
Patient	User that need help from therapist to reduce its stuttering.
External database	Database stores in the cloud.

References

- IEEE Recommended Practice for Software Requirements Specifications
(<http://www.cse.msu.edu/~chengb/RE-491/Papers/IEEE-SRS-practice.pdf>)

Overview

General description

The application is intended for :

- **Stutter user** : person who wants to do exercises to improve its flow of speech ;
- **Therapist** : a person able to give feedbacks (rate exercises, give advices, suggest exercises).

Product perspective

Stuttherapy is a mobile application available on Play Store and eventually on iOS app store. Users can create an account. An account have two purposes :

- Synchronise data on the cloud ;
- Use features that required to be logged (e.g. : communication between a therapist and their students).

If user is logged, data can be save on an external database, if the user is not connected, data will be save on the user device. To access data from the database, user have to be logged. Two authentications methods will be available :

- **standard authentication** with an email and a password ;
- **social authentication** with an Google account.

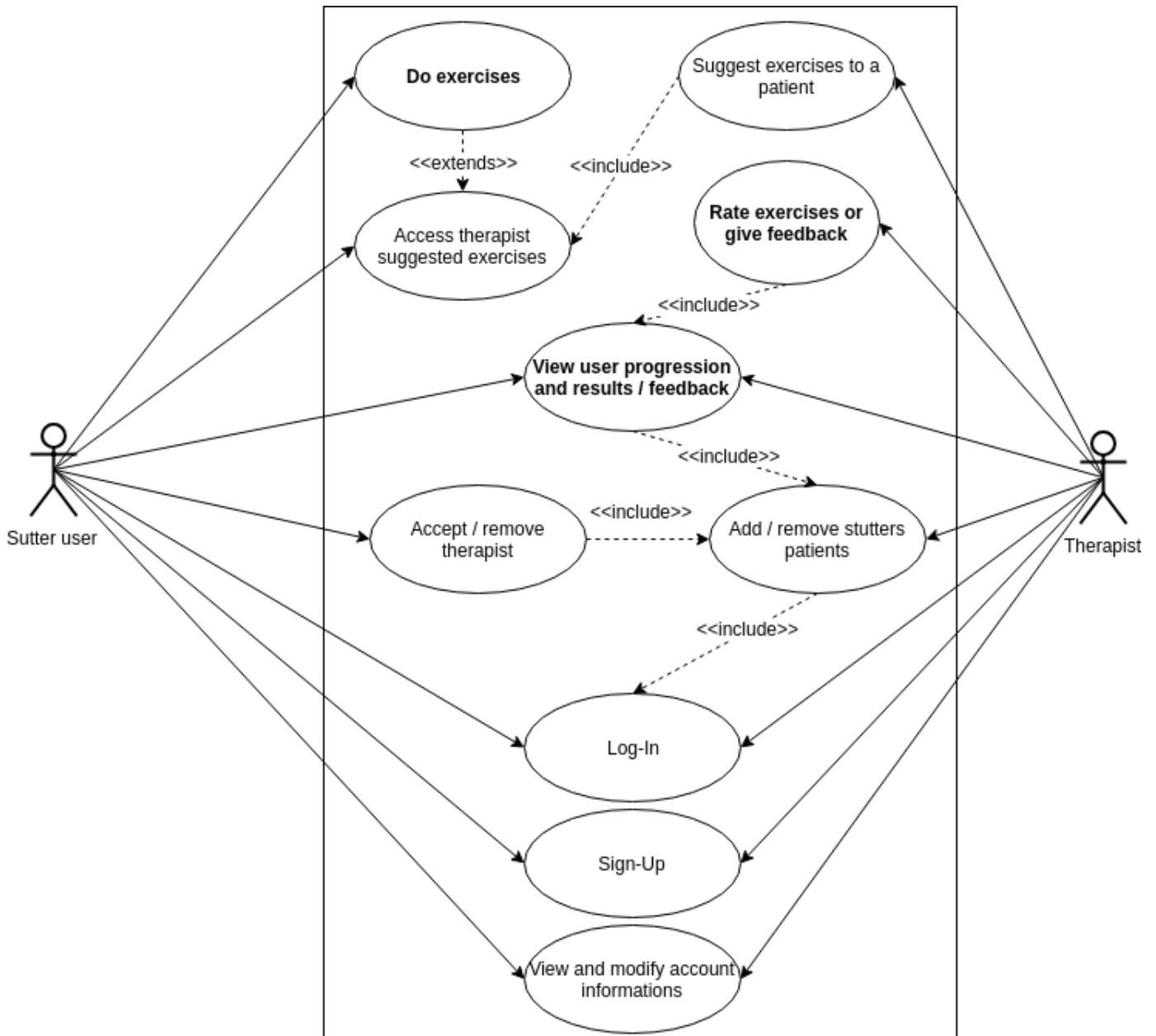
Hardware

Basics hardware requirements can be required for some features :

- **Internet accesss**
- **Microphone** (e.g. : delayed auditory feedback)
- **Front-facing camera** : (e.g. : mirroring)

Product functions

Here an use-case diagram to recap all features :



Constraints

User data are stored on an external database, these data can only be visible by the user himself or by a therapist if the user **authorize** a therapist to access to his data. Data privacy policy has to be clear, user has to know which data is available to other, which data is **strictly** personal.

No sensible informations will be stored by the application itself (*credit card informations, password of other services, etc.*).

The application is intended to be available on app marketplace (Play Store and App Store), the application can be available on different country. The application have to follow regulation and laws in the country chose to distribute the application (*data policy, etc.*).

Specific requirements

The section explain and describe first the data synchronisation and then system use-cases (see *use-case diagram above*).

Data Synchronisation

Data synchronisation is only available with an account and with an internet access. Data are not automatically synchronise from/in the external database. There are two types of data store in the external database :

- **Personal data** : exercises progression logs and personal information (email / id / password / ...)
- **Shared data** : typically exercises data (texts / short sentences / words / ...)

Therefore, the user has to handle independently the synchronisation of these two databases, the one to upload personal data on the external database, the other to update / download exercises data.

Use-case : Sign-Up

	Description
Function	Create an account for a user
Requirements	Internet connection
Description	<p>A non-logged user can create a new account to save data in the cloud and access to some features available with an account (see use-cases with <i>Stutter account</i> or <i>Therapist account</i> requirement).</p> <p>Two methods of authentication are available :</p> <ul style="list-style-type: none">- Standard method : a form with an email, password, password verification fields.- Social authentication : User can create an account with a Google account, form with the email and password is handled by the Google authentication service, the application keeps only information available by API provided by Google authentication service <p>After this first form, the user is logged and has to indicate its status to continue : <i>Stutter user</i> or <i>Therapist user</i></p> <p>The account information is saved on an external database.</p>

Use-case : Log-In

	Description
Function	Logged the user in the app
Requirements	Internet connection - Stutter account OR Therapist account
Description	<p>If the user have already an account (stutter or therapist) he can log to the app with two different methods, depending of its initial sign-up method :</p> <ul style="list-style-type: none"> - Standard form : email and password fields - Social buttons : Google authentication button, and it's google that handle the form (Google e-mail / password) <p>After connection process if form is correct and if the user have an account, the user will be logged to the app will be redirected to the homepage</p>

Use-case : View and modify account informations

	Description
Function	View profile information and modify them
Requirements	Internet connection - Stutter account OR Therapist account
Description	<p>A logged user can access to its account to handle its personal informations :</p> <ul style="list-style-type: none"> - Change sign-up informations as email or passwords - View its unique and personal identification key - Delete definitely its account (personal informations + data) - Reset its account data (progression, results, allowed therapist, patients, etc) - For therapist only : Add comment status (see <i>Use-case : Give patient exercises feedbacks</i>)

Use-case : Handle stutter patients

	Description
Function	Add patient (stutter user) to follow to track its progression / give feedbacks / ...
Requirements	Internet connection - Therapist account
Description	<p>A therapist is able to add stutters to follow to :</p> <ul style="list-style-type: none"> - Track their progressions - Give results, feedback of exercises done by the stutters - Give exercise to stutters <p>To add a patient the therapist has to have the stutter user key (a unique key associated to the account). This key is available in the app, in the account informations. The stutter informations is not directly available for the therapist, the stutter have to accept the therapist request, to summarize there are 4 states after the request :</p> <ul style="list-style-type: none"> - Request pending : the request has be sent but the stutters user do not yet approved ; - Request approved : stutters accept the request, the therapist can access to the stutters informations ; - Request refused : the stutters reject the request, the therapist cannot access to the stutters informations ; - Request revoke : the stutter user revoke the access, this state is possible only if the stutter user approved the request before. <p>The therapist can see at any time the list of his patients and delete them of his list of patients.</p>

Use-case : Handle allowed therapists

	Description
Function	Add a therapist allowed to access to the progression associated with the account
Requirements	Internet connection - Stutter account
Output	Add a therapist to the list of allowed therapist account
Description	<p>Once a therapist made a request to add a stutters account to his patients, the stutter user receive this request and he can accept or refuse the request. If the stutter user accepts, the therapist will have an access to the stutter user progressions / results, and the therapist will be able to give some feedbacks about exercises and suggest exercises to do.</p> <p>At any time, the stutter user can see the allowed therapists list and remove an allowed therapist of its account (=revoke the access of its informations to a therapist).</p>

Use-case : View exercises results / progression / feedbacks

	Description
Function	Visualize stutter user exercises progression charts and feedback give by a therapist about these progression charts
Requirements	<i>None</i> (internet connection and account unblock features)
Description	<p>Stutter user can visualize charts about his progression over day, week, month and year.</p> <p>They can see the history of their exercises and access to the exercise logs (recording, responses, data, etc.). Each exercises defined its format of the chart and of the logs, see <i>Use-case : Do exercises</i> to have more informations about these informations.</p> <p>A therapist can also visualize these informations for their patients.</p>

Use-case : Communicate with patient

Therapist can interacts with his patients with 3 ways :

- **Comments** : general comments, just some texts (it can be advice for example)
- **Exercise suggestion** : therapist can suggest exercise to the patient (with custom settings and resources)
- **Exercise feedback** : comments, feedbacks about exercises done by patients

Comments

Exercise suggestion

Exercise feedback

	Description
Function	Provide feedbacks / advices / comments about exercises
Requirements	Internet connection - Therapist account
Description	<p>For each patient, the therapist can visualize the log and add a feedback to help the stutters user. A feedback is composed of 3 fields :</p> <ul style="list-style-type: none">- Status: pre-filled comment (eg: “👍 <i>Perfect !</i>”) ;- Comment: text field to enter some advices, comments, whatever ;- Date (automatic field) : current date when the feedback is submitted. <p>At least one of <i>status</i> or <i>comment</i> have to be filled. A therapist can save its own status on its profile. At any time, the therapist can delete or modify his comments.</p>

Use-case : Do exercises

An exercise is independant : it has structure and data that does not depend of other exercises. Data can contain exercises content and user informations (e.g. results of previous exercises). Exercises can also share data with other exercises, so an exercise can managed its data as it want :

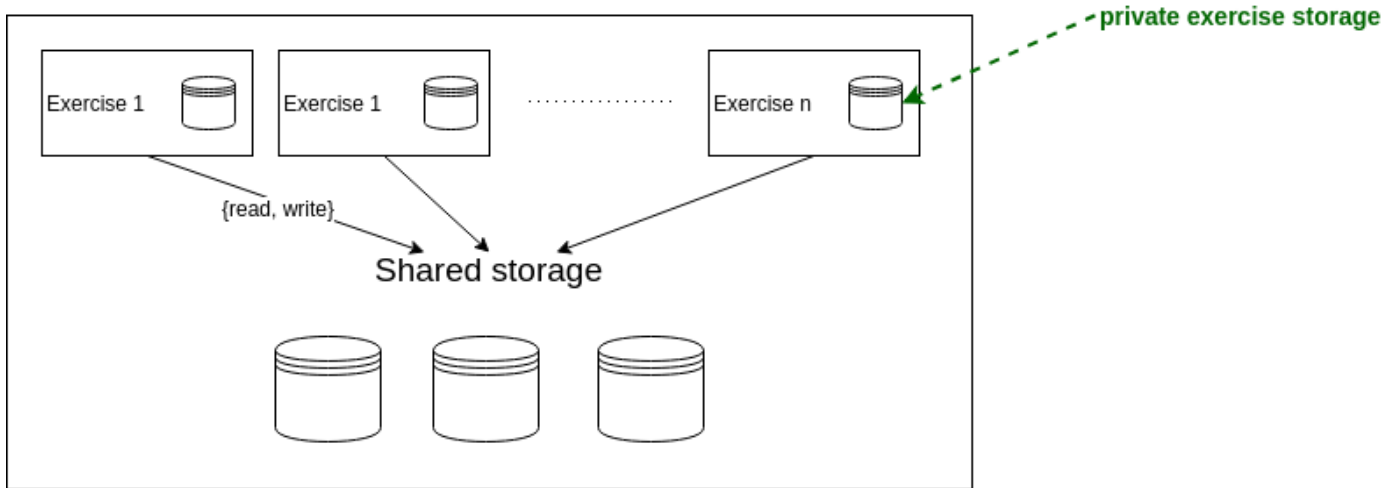
- **private storage** : only accessible (read and write) by the exercise itself
- **share storage** : public storage accessible by all exercises (to write, read, delete data)

A complte exercise structure is composed of two parts :

- **Exercise structure** : which data is usefull to use, where to store data (private storage / share storage), how to dislay the exercise, how to answer, etc.
- **Progression structure** : which data has to be used to display progression, type of chart, etc.

Each exercise have to be complete with this following informations :

- How to do the exercise
- What is the purpose, how it can help the stuttering ?



Resources for exercises

Type	Description
Medium/long text	Long texts of several sentences, user can chose the text he want to do the exercices and he can also add texts to its favorite texts. To chose a text, the user can order them by the number of words and select only among his favorite texts.
Short sentences	Collection a sentences, few words. Short sentences are picked automatically
words	Only one word, words are picked automatically

See *appendix A* to know more about the storage policy.

Exercise can :

- **Chose a resource** for the exercice
- **Let user chose** among chosen resources (all, only among 2 type, ...). In this case, user have to chose the resource he want at the beginning of the exercises.

Ways to percept resources

- **Permanent text** : the resource is displayed without any restrictions
- **Covered text** : the resource is dislayed during few amount of time (eg: $2\text{sec} \times \text{number of words}$), and then the resources is covered. The user can still press the covered area to display them.
- **Vocal text (only for words and short sentences)** : The resource is read by a computer generated voice, the user can replay the voice.

Exercise can :

- **Chose itself** how user have to percept resources
- **Let user decide** how he want to percept resources

Tap to add to stutter words list feature

The user can select words from resources that he cannot say correctly (each exercises can :

- **require** this feature,
- **disable** this feature
- **let the user decide** if he wants this feature at the beginning of the exercise

Following a description how the feature have to be implementing depending of resources :

- **medium/long exercise** : at the end of the exercise the user can select words if the feature is enable
- **short sentences** : between each sentences displayed the user can select words if the feature is enable
- **words** : to display an other word the user have to say if he correctly pronounce the words or not (if the feature is enable)

Exercise progression

A progression is composed of :

- **Video or audio recording** : video or audio record of the exercise (if available) with a progress bar to go wherever the user wants
- **(Annotated) resource** : resource used for the exercise, if user chose to check his pronunciation, words can be marked.
- **Exercise settings** : settings used for the exercise

A chart for each exercise is available. There is a maximum of 3 charts (one for each resources) : the chart data is the ratio of *correct words* / *total words*.

Exercises

Following are the specification for each exercises

Exercise 1 : Metronome

	Description
Function	Exercise to recording his voice with a metronome
Requirements	Microphone
Description	<p>The user have to read a medium/long text or a succession of short sentences with a tempo defined by a metronome.</p> <p>Metronome the stutter user can change the value of the metronome interval (beats per minute). Once the exercises is launched, each metronome pulse is perceptible thanks to :</p> <ul style="list-style-type: none"> - <i>A sound</i> : A sound is emitted for each pulse (it can be disable) ; - <i>A visual information</i> : A visual information is displayed for each pulse
tap to add to stutter words list	Let user decide at the begining.
Ways to percept resources	Let user decide at the begining
Storage used	<ul style="list-style-type: none"> - Medium/long texts - Short sentences - Favorite texts - Sutter words - Exercise logs : private exercise storage

Exercise 2 : Delayed auditory feedback

	Description
Function	Delayed auditory feedback exercise
Requirements	Microphone
Description	<p><i>(Wikipédia) Delayed Auditory Feedback (DAF) is a type of altered auditory feedback that consists of extending the time between speech and auditory perception</i></p> <p>The stutter user have to read a medium/long text or a succession of short sentences, and he listen its voice with a delay (<1s).</p> <p>Voice perception delay User can chose the delay time and adjust the intensity of the sound (he can speak to test the settings)</p>
tap to add to stutter words list	Let user decide at the begining
Ways to percept resources	Let user decide at the begining
Storage used	<ul style="list-style-type: none"> - Medium/long texts - Short sentences - Favorite texts - Sutter words - Exercise logs : private exercise storage

Exercise 3 : Reading

	Description
Function	Reading texts or words and track difficult words
Requirements	<i>None</i>
Description	<p>Users have to read succession of words, succession of short sentences or a medium/long text. There are 3 ways to perceive these resources.</p> <p>The user can choose to record the exercise or not. The user can stop the exercise when he wants.</p>
tap to add to stutter words list	Required
Ways to perceive resources	Let user decide at the beginning
Storage used	<ul style="list-style-type: none"> - Medium/long texts - Short sentences - words collection - Favorite texts - Stutter words - Exercise logs : private exercise storage

Exercise 4 : Mirroring

	Description
Function	Speech with video recording to analyse his physical behaviour during the speech
Requirements	Front facial camera - Microphone
Description	Users has to read succession of words, succession of short sentences or a medium/long text and his face is recorded to analyse his muscles, his behaviour during the stuttering, ... When he launch the exercise the front facial video recording is also started. He can chose to dislay or not the video feedback.
tap to add to stutter words list	Let user decide at the begining
Ways to percept resources	Let user decide at the begining
Storage used	<ul style="list-style-type: none"> - Medium/long texts - Short sentences - Favorite texts - Sutter words - Exercise logs : private exercise storage

Exercise 5 : Stutter rate

	Description
Function	
Requirements	
Description	
tap to add to stutter words list	<i>No resource used</i>
Ways to percept resources	<i>No resource used</i>
Storage	

Use-case : Suggest exercises to a patient

	Description
Function	
Requirements	Internet connection - Therapist account
Description	

Use-case : Access therapist suggested exercises

	Description
Function	
Requirements	Internet connection - Stutter account
Output	
Description	

Conclusion

This document defined the purpose of *Stutter Manager* application and how it should be. Every application modification or improvements has to be add in this document to keep a cohesion between the technical part (the application itself) and the specification parts (this document). The modification logs (short summary of performed modifications) are available at the beginning of the document.

Appendix

A : Shared storage database

id	description	user data
1	Collection of texts	no
2	Words collection	no
3	Sentences collection	no
4	Favorite texts	yes
5	Sutters words	yes