6A - PROGRAMMING

Why an android app?

The objective of the project is to design and fabricate a toy which helps enhance the learning and cognitive skills of a child with Down's syndrome. Taking into consideration their attraction to soft toys, round objects and textures, the Octobud was proposed.

The Octobud is a constant companion for the child. Adding a permanent screen would not only make it costly but also reduce the soft toy factor from the Octobud. Since the Octobud can be thrown around, cuddled with etc, a removable screen was the next best option.
Keeping in mind the feasibility and as an attempt to make the toy economical, mobile screens were an appropriate solution as a replacement for the permanently, potentially breakable screen.

An android application that can be installed in the parent/guardian's phone and can be plugged in for 15-20 minutes so the child to learn. Android phones are common in most households and the application runs on API 21 and higher thus targeting more than 96 per cent of Android users. The phone can be removed from the toy and used as usual.

About the application:

The main objective of the application is to provide visual and audio aid.Android studio IDE is used for developing the whole application.

The application can be used for multiple children as well. Since internet connection in schools is not always available, this application is offline and needs the internet only once, while installing it. It contains a login page which takes username and password as input to provide an authentication to the app that is only the registered users or the parents/guardians can access the features of the app and also kids should not access the app. There is a registration page also for the first time users to register themselves for starting the app for their kids. This page takes the name, email address and password as input and store these in the database and later they are used in the login page to check whether the user is registered or not.

Hardware Interfaces

• Arduino microcontroller along bluetooth module for connectivity with the app.

• Development supports Android version 4.0 and above.

Database: SQLite database is used for storing the data. Database model contains an ID column, a name column, an email address column, a column for a password, one for child's name, one for product serial number and seven for storing the level kid reached in each of the learning feature provided by pressing the tentacles of the Octobud.

Relation Tables:

Table 1:

name	email_id	child_name	password	product_id

Email_id is the primary for this table.

Table 2:

set	level	email_id

Email_id is a foreign key from table 1 and set is foreign key from table 3.

Table 3:

set	level_def	sr.no.	inf_name	video	level

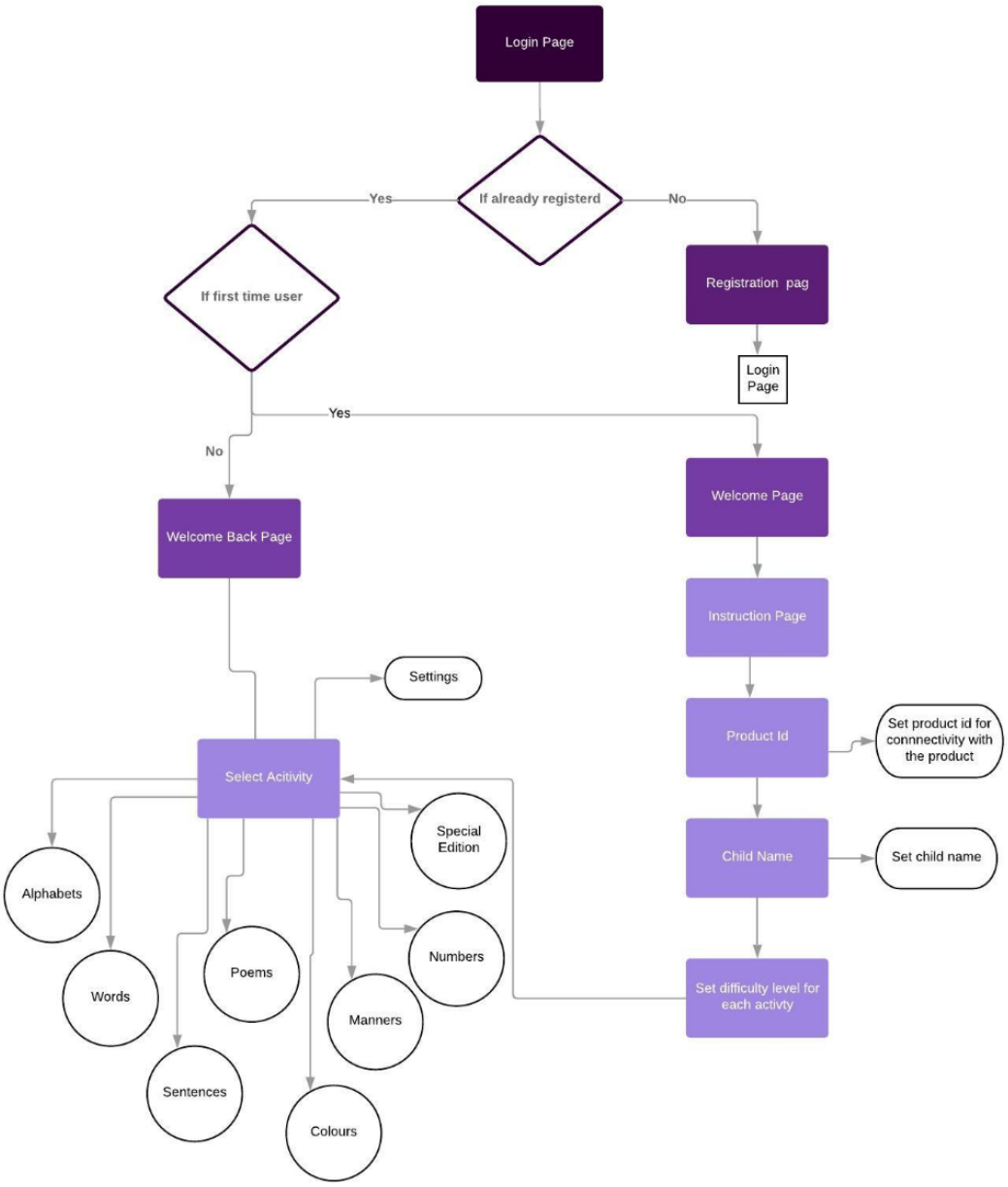
Set and sr.no.(Serial Number) are primary keys for this table.

Different java classes are used for each activity like activity_alphabets, activity_colors, activity_manners etc. and corresponding xml layouts are made with colors and fonts based on our research with down syndrome kids. Suitable java classes and xml layout files are made for instructions pages, pages to set difficulty for each learning activity, login page and register page. Also, android tools like AppCompatActivity, RelativeLayout, etc. are used to make the application visually appealing and easy to use.

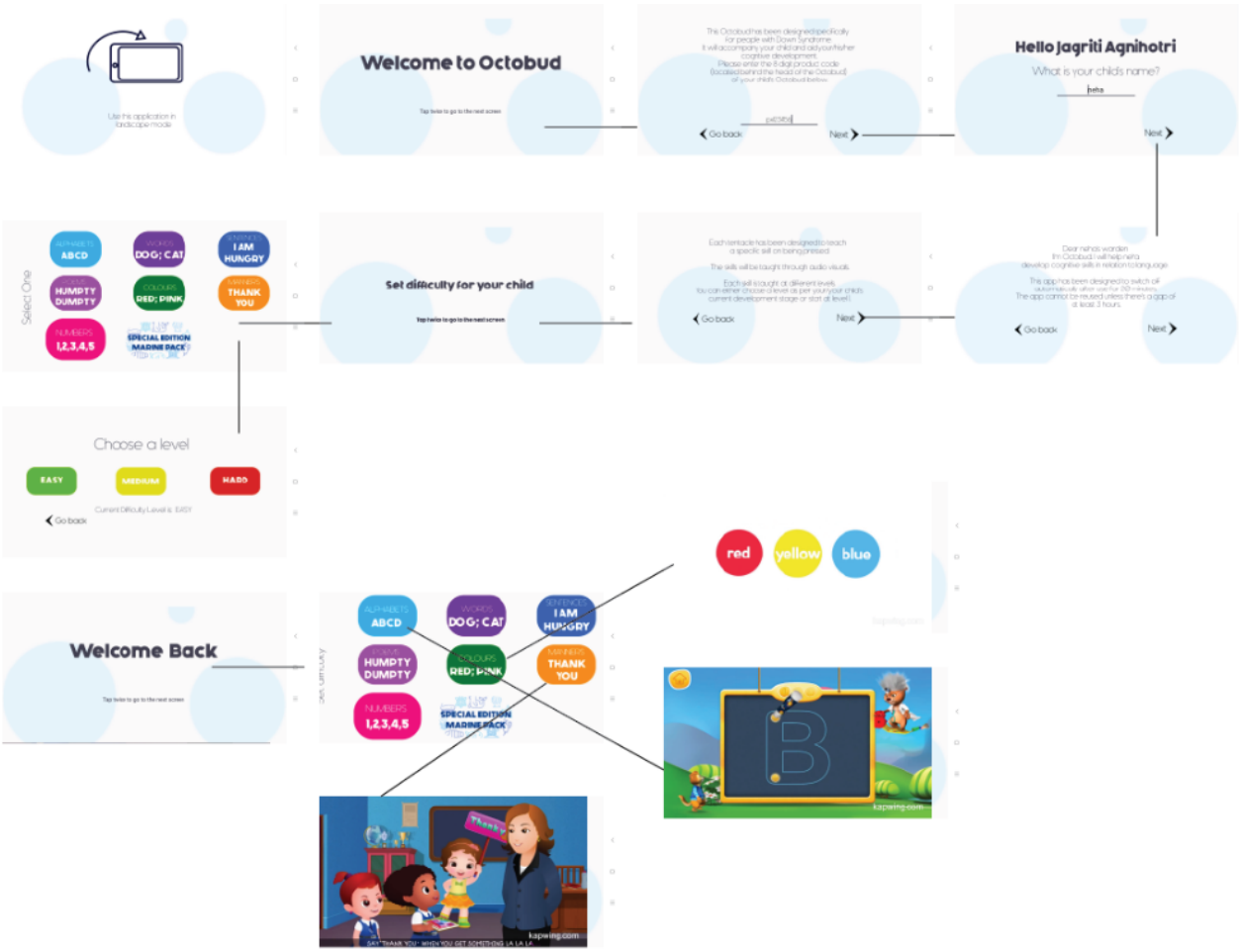
Child's name is asked once the login is done and used in later stages of the app to address the kid. Levels are initialised to one and continuously updated as the kid proceed to higher levels by learning.

Once this is done, a page appears showing seven options each for an activity for learning alphabets, words, sentences, poems, colours, manners or numbers and an extra option for the special edition marine package. On applying pressure on a tentacle, an activity will start corresponding to that

tentacle. Some videos and study material is shown to the child. Each material corresponds to a certain difficulty level. The level that can be perceived by the child is to be determined by the warden and the default setting will be EASY. With the help of videos and quirky animations, the app will have a visual impact on the child thus enabling him/her to retain information and have fun exploring new content and singing along to fun activities. There is a time limit, after which the user or child cannot use the app so that kids do not get addicted to the mobile.



An example of the flow of the app -


Use this application in landscape mode
Welcome to Octobud
Tap twice to go to the next screen
This Octobud has been designed specifically for people with Down Syndrome. It will accompany your child and aid your his/her cognitive development.
Please enter the 8-digit product code (located behind the head of the Octobud) of your child's Octobud below.
Go back
Next
Hello Jagriti Agnihotri
What is your childs name?
heha
Next
Select One
ALPHABETS ABCD
WORDS DOG; CAT
PHRASES I AM HUNGRY
HUMPTY DUMPTY
COLOURS RED; PINK
MANNERS THANK YOU
NUMBERS 1,2,3,4,5
SPECIAL EDITION MADINE PACK
Set difficulty for your child
Tap twice to go to the next screen
Each tentacle has been designed to teach a specific skill on being pressed.
The skills will be taught through audio visuals.
Each skill is taught at different levels. You can either choose a level as per your your child's current development stage or start at level1.
Go back
Next
Dear rehab's warden
I'm Octobud.I will help rehb's develop cognitive skills in relation to language.
This app has been designed to switch off automatically after use for 20 minutes.
The app cannot be re-used unless there's a gap of at least 3 hours.
Go back
Next
Choose a level
EASY
MEDIUM
HARD
Current Difficulty Level is: EASY
Go back
Welcome Back
Tap twice to go to the next screen
red
yellow
blue
B
kapwing.com
Thank
kapwing.com