CMPT 275: Software Engineering I
Fall 2017

HW2 - Requirement Document

Project Group 2 - The Night Owls

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Revision History

Revision	Status	Publication / Revision Date	By
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1.1	Introduction.	10/08/2017	Fahd Chaudhry
1.2	Non-functional Requirements section.	10/09/2017	Karamveer Dhillon
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1.4	Intended Audience List and Features.	10/11/2017	Fahd Chaudhry
1.5	Introduction editing. Glossary additions.	10/13/2017	Shawn Thai
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2.0	Added VA multiple language support and setting option.	10/20/2017	Shawn Thai
2.1	Added details on project goals and what makes app special in “Introduction.” Fixed numbering of references.	11/05/2017	Shawn Thai

1. Introduction

goTalk will focus on one of the most challenging problems that autistic children and their caregivers face in their everyday lives. Autism can manifest in some people as social awkwardness, speech impediments or even an inability to speak . We aim to tackle this problem in a tried and tested way — via an interactive iOS image-board with image-to-speech capability.

What goTalk will do differently from other existing apps will be the ability to save or favourite buttons for easier access in the future. The buttons will be organized into clear and distinct categories, and the images will be taken from Google Images, as opposed to stick figures commonly seen in most symbol-communication apps [1].

Whereas most of the good quality apps that assist non-verbal autistic children are priced from $20 to over $100, such as the popular Proloquo2Go app [2], goTalk will be completely free. The reason is because every child should be able to voice themselves without having any sort of financial burden placed upon them or their parents/caretakers. Children should not feel as if they are locked within their own minds. Therefore, our plans to make goTalk free to the public addresses some financial issues that come with the existing apps in the market.

The stakeholders for goTalk are non-verbal children diagnosed with autism. Anyone that needs to communicate with these children, such as family, relatives, friends and teachers, would also be stakeholders, as this app would directly benefit them as well. goTalk will allow children to use the app to voice out how they are feeling, what they want or do not want, what they like and dislike, and other common aspects of basic communication.

The app aims to be efficient and fast so that users do not become stuck searching for a desired word. goTalk will display items and common phrases for different categories (e.g. food, emotions, drinks). This will allow the child to easily navigate through the app and select from a multitude of pictographic buttons. Upon selection, the display bar will visually aid caretakers on what the user wants to say via the words that appear on the display. After that, they may press the “GO” button and the mobile device will say the phrase they have created in the display bar.

2. Intended Audience List

2.1) Non-verbal Autistic Children

These children do not have the ability to speak at all. This is very troublesome for parents and caretakers as they have to "guess" what the child is saying or wanting to say. It is also very difficult for these children to express themselves and show others information or things they know as they do not have a straightforward way of showing it. They can use only nods, hand gestures and facial movements to answer any questions which limits their potential. This lack in communication may also cause confusion between the child and the person they are interacting with as the reliability of the information being passed is inconsistent. For example, if the child is being asked what they want for breakfast, they can point to certain things in the kitchen but cannot express themselves by telling their parent or caretaker exactly what they want. The goal of goTalk is to allow specific expressions in an intuitive manner that helps in communication between the child and their parent/relative/friend/caretaker.

2.1.1) Expectations

The child needs to be familiar with basic functions of the iOS device being used. They would need to know that the touchscreen will be used to navigate the phone using their hands/fingers and that there are no physical buttons to navigate through the screen. Physical buttons on the device control the volume, silent/mute switch and screen wake/sleep. Among these, the child only needs to use the volume buttons to control the volume and in certain situations the power button to turn the screen on/off.

2.2) Caretakers/Parents/Friends/Relatives

Caretakers/parents/friends/relatives of autistic children have a hard time understanding them. This makes it a challenging task to tend to the needs of the children as it creates a major obstruction in communication. Paper methods can usually work but are extremely slow and inefficient as a paper holds limited amounts of information. Another barrier is that caretaker/parents do not know the child's potential due to the lack of verbal communication. GoTalk will do its best to close that gap so communication between the child and their caretaker/parent/friend/relative will be effective and efficient and free at the same time.

3. Features/Functional Requirements

goTalk's main feature will be to use a graphical user-interface on the iOS platform to allow autistic children to communicate via pictographic buttons on the screen.

3.1) Login Screen

When the app first launches, the app shall prompt the user to create a new goTalk account. If the user has an existing account, then they may directly login. The signup process shall be very simple and requires only the user's name, email and a password. The user's name field will be optional.

When launching the app for the very first time, internet access shall be required for account creation and login. All consequent launches do not require internet. The cloud shall store the login information and shall sync the user's settings and favorites. When the user accesses any other device with the app (i.e. new iPhone, iPad), their settings and favorites can be imported once they login.

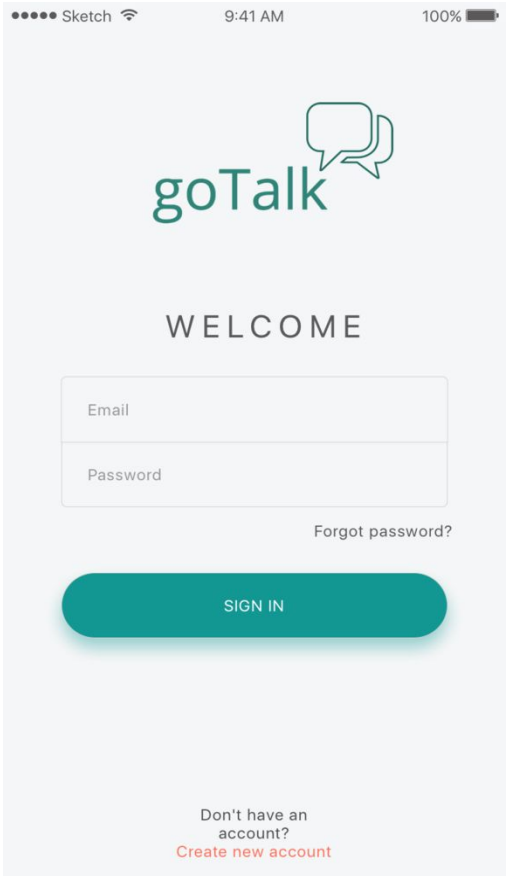

Figure 3.1.1: Login Screen

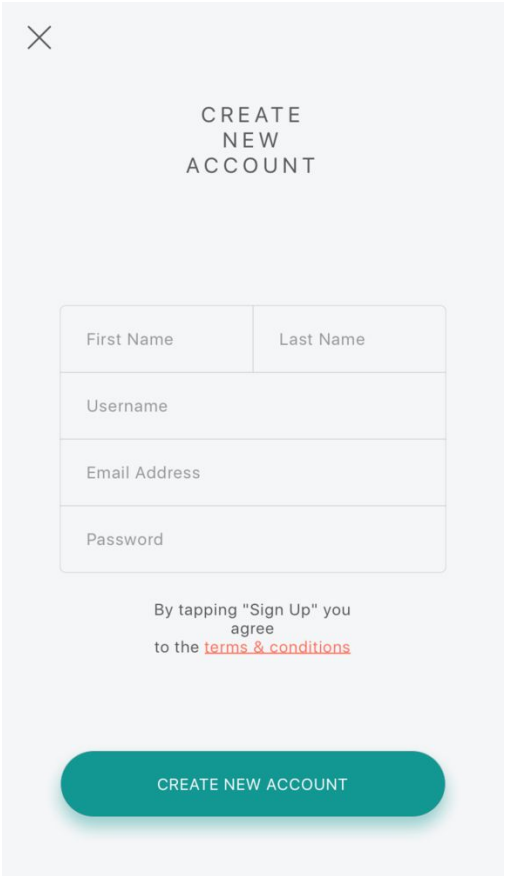

Figure 3.1.2: Registration Screen

3.2) Main Screen

On the main screen, the app has pictographic buttons which when pressed via the device's touchscreen, a voice assistant (SIRI) shall say out loud the word/phrase entered into the Display Bar.

The layout of the main screen will be simple and concise. At the very top, there shall be the Menu Window button and the goTalk logo. Below this, there shall be the Display Bar. To the right of the bar, there shall be an "X" button and a "GO" button. Below the Display Bar will be the Categories Row. Below that shall contain pictographic buttons corresponding to the selected category. The default category selected is the Favourites Category.

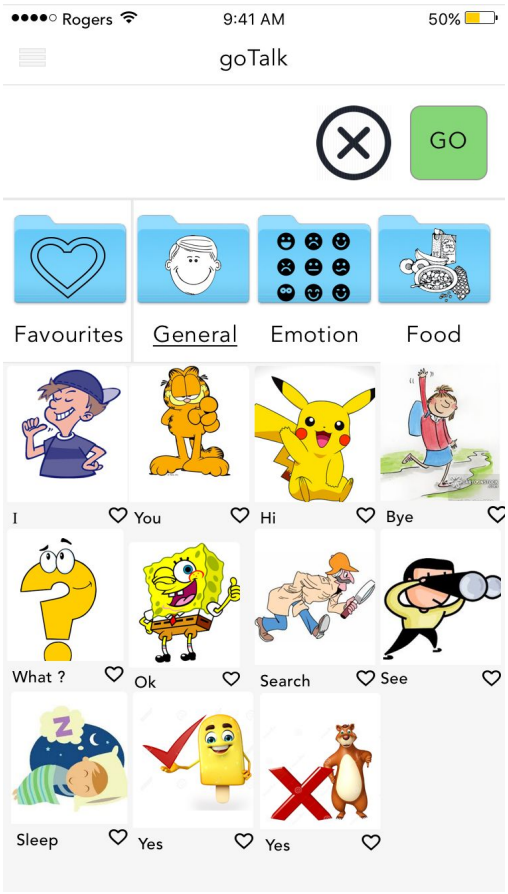

Figure 3.2: Main Screen

3.3) Menu Window

At the top-left of the main screen (*see 3.1*), there will be a menu button symbolized by three horizontal lines. When the user taps on the menu button, a side bar covering half the screen shall slide out from the left which the user can use to navigate through additional options and settings.

The Menu Window shall have the following selections:

- "*Home*" which shall reset the app view to its default state, where the General Category has been selected.
- "*Settings*" which shall direct the user to the "App Settings" (*see 3.11*).
- "*About*" which shall display a short paragraph description of the goTalk app as well as about the group that created the app, *The Night Owls.*
- "*Help*" (*see 3.10*).
- "*Logout*" which shall log the user out of the app. The next time the app is launched, the app shall display the Login Screen (*see 3.1*).

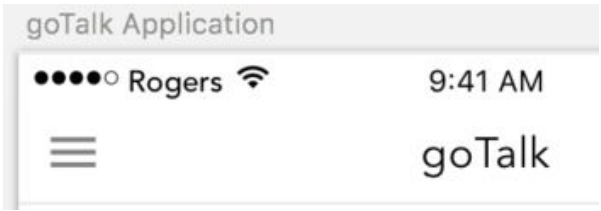

Figure 3.3.1: Menu Window Button

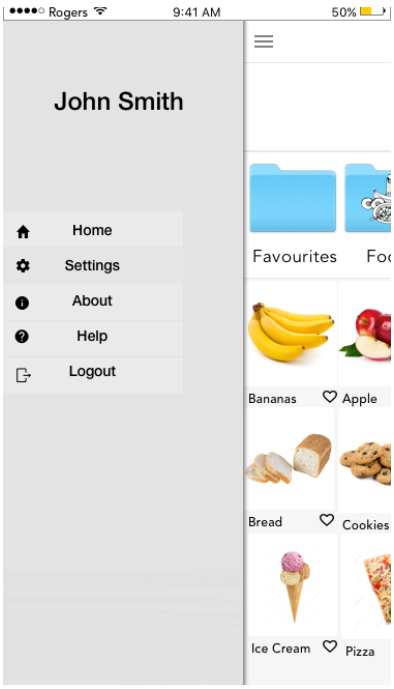

Figure 3.3.2: Menu Window

3.4) Display Bar

At the very top of the main screen, there shall be a long rectangular box called the Display Bar. The Display Bar shall display the pictograph buttons (*see 3.6*) that the user selects. The user can delete the most recent entry into the Display Bar by using the delete button beside it (*see 3.5*).

3.5) "GO" and "X" Buttons

On the right side of the Display Bar (*see 3.2*), there shall be a button labelled with a grey "X" (also known as the delete button) and a green button labelled with the word "GO".

When the user taps on the "X" button, the app shall delete the last entry inserted into the Display Bar. If the Display Bar is empty (no entries), then the "X" button shall do nothing.

When the user taps on the "GO" button, the app shall activate the Voice Assistant (*see 3.4*). This shall make the device speak out the entries/words shown on the Display Bar. If the Display Bar is empty (no entries), then the "GO" button shall do nothing.

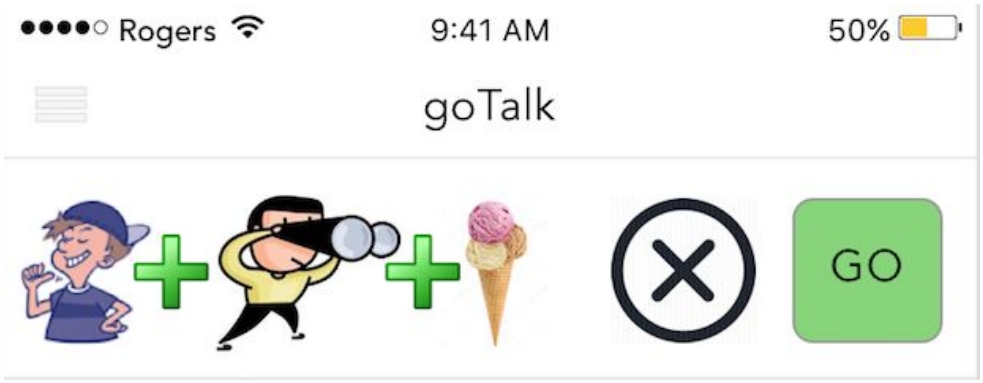

Figure 3.4: Display Bar with "X" and "GO!" buttons.
Three buttons have been selected. (I + See + Ice Cream).

3.6) Voice Assistant

The pre-installed voice assistant, SIRI on iOS, shall be used to voice out the text in the Display Bar. This voice assistant shall support multiple languages, with English as its default. There shall be an option that will allow the user to disable the voice assistant when the user presses a pictographic button. Note, this will NOT disable the voice assistant when pressing the "GO" button.

3.7) Pictographic Buttons

The app shall contain a series of pictographic buttons in the section below the Categories Row (*see 3.8*). These buttons shall be vertically arranged and correspond to the Category selected. The user can select a button that corresponds to their need, and upon tapping it, the button shall be placed into the Display Bar (*see 3.4*) as the most recent entry.

The button will also have an empty (white) heart symbol besides the name of the button. By holding down the button, the user can add the button to the Favourites Category (*see 3.10*). Doing so shall light the heart symbol up in red.

If the user holds down the button again, the button shall be removed from the Favourites Category and the heart symbol shall turn white.

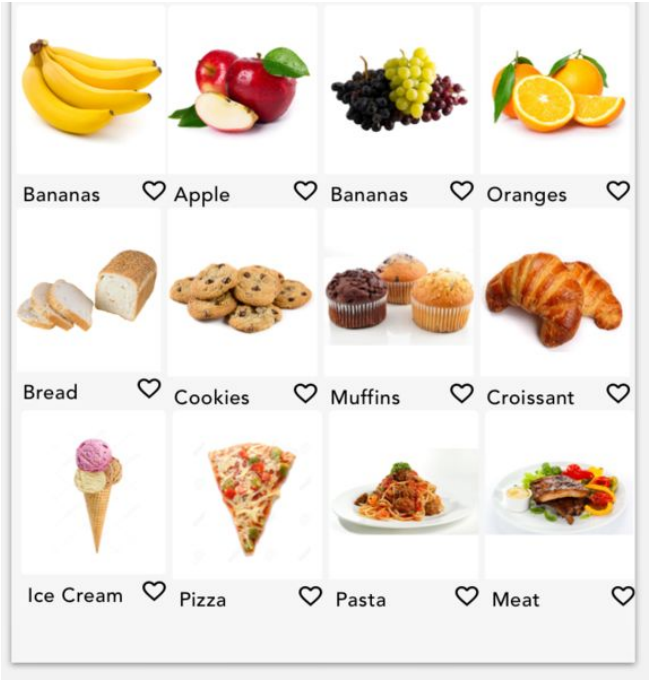

Figure 3.7: Pictographic Buttons

3.8) Categories Row

The app shall have the Categories Row below the Display Bar. The first category shall be the Favourites Category (*see 3.10*) and shall stay pinned to that location at all times. This shall allow the user fast and easy access to all of their favorite buttons.

The default category selected upon app launch shall be the Favourites Category, which shall display pictographic buttons such as "*Yes*," "*No*," "*I want*," "*I will*", etc.

The app can display three additional categories on the same row which will be scrollable to the left or right. Once the user selects a category, the app shall display the pictographic buttons corresponding to that category in the section below it. The options of the category shall also be scrollable to the left or right.

A list of categories that the app shall support:

- General
- Food
- Drink
- Emotions
- Actions
- Places
- Toys
- Colours
- Numbers
- Shapes
- Clothes
- School Objects
- House Objects
- Weather

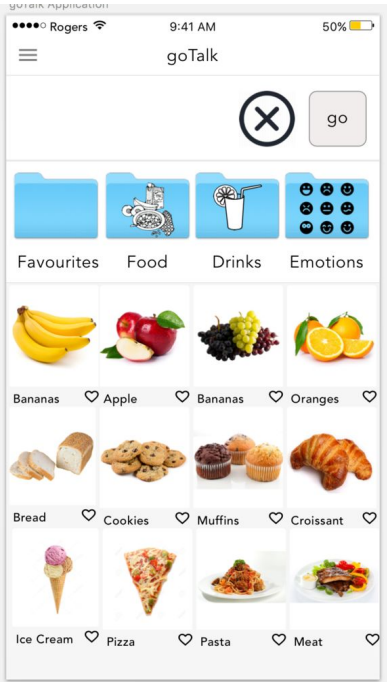

Figure 3.8: Categories Row

3.9) Favourites Category

The Favourites Category shall be located as the first entry in the Categories Row (*see 3.8*). When the user taps on the category, the pictographic buttons (*see 3.7*) below the Categories Row shall change to the buttons that the user has selected as "*Favourites*". If no buttons have been favourited, no buttons shall appear upon tapping the category.

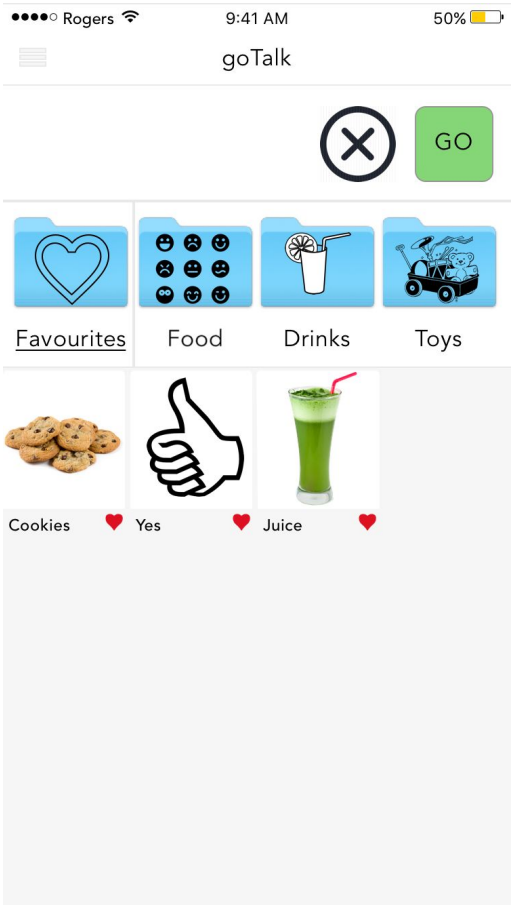

Figure 3.9: Favourites Category

3.10) Help

There shall be a Help button that can be accessed from the Menu Window (*see 3.2*). Pressing the Help button shall take the user to the app's help page located on the official website. The help page will contain a FAQ and a short tutorial detailing the usage of the app.

3.11) App Settings Screen

The App Settings Screen can be accessed via the Menu Window (*see* 3.2) at the top left of the app. The user shall see the username associated with the account currently logged in. The App Settings Screen shall list several options that the user can enable and disable. The user may also sync their app data.

In order, the options are:

- "*Sync*" which shall store app setting configurations and Favourites Category data into the app's database. This requires internet access.
- "*Set Voice Assistant Language*" which shall prompt the user for a new language for the Voice Assistant to use.
- "*Auto Correct*" which will turn on grammar detection and correction. This shall be off by default.
- "*Speak Selected Word*" which the Voice Assistant for when the user taps on a pictograph button. This does not disable the Voice Assistant when tapping the "GO!" button.
- "*Scroll Back Category*" which shall make the app "jump" back to the default state after the user taps a pictographic button. The default state is when the Favourites Category has been selected.

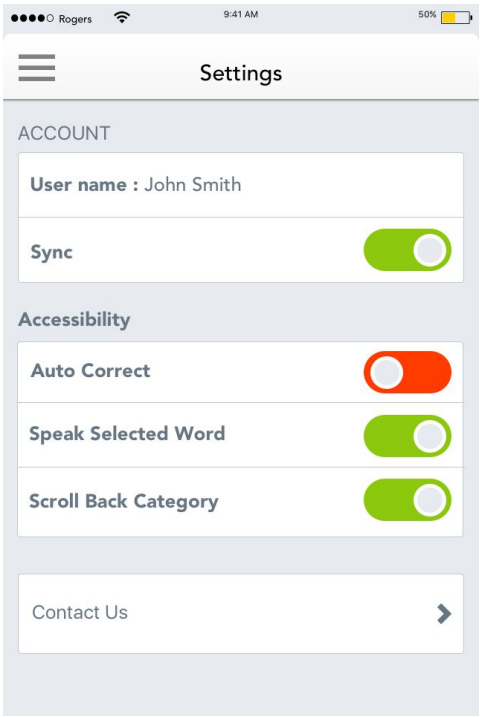

Figure 3.10: App Setting Screen

4. Non-functional Requirements

In addition to the functional requirements, the following are non-functional requirements that must be met. Non-functional requirements are defined as requirements that are not directly concerned with specific services delivered by the system but set constraints on the workings of the system.

4.1) Speed

The app shall boot up in less than 5 seconds. Also, the average response time shall not exceed 0.1 seconds. If response is taking longer than 1 second, the app will display a "waiting" symbol. [3]

4.2) Size

In accordance with the rules set by Apple, the initial install size of the app shall be less than 4 GB. Any additional content will be downloaded in-app. [4]

4.3) Robustness and Reliability

In the event of a system failure, the app may be restarted, which must have a boot up time of less than 5 seconds.

4.4) Operating System

The app will be available on all iPhone devices that support iOS 11. This includes iPhone 5s and any iPhones that came after it's release.

4.5) Efficiency

The app will use less than 0.5% battery life per minute of active use.

4.6) Security

The app utilizes a login feature, so that the user should only be able to access their accounts. All login information and saved data shall be stored in a database to prevent hackers and security bypasses.

5. Example Tutorials

5.1) Logging In and Registering

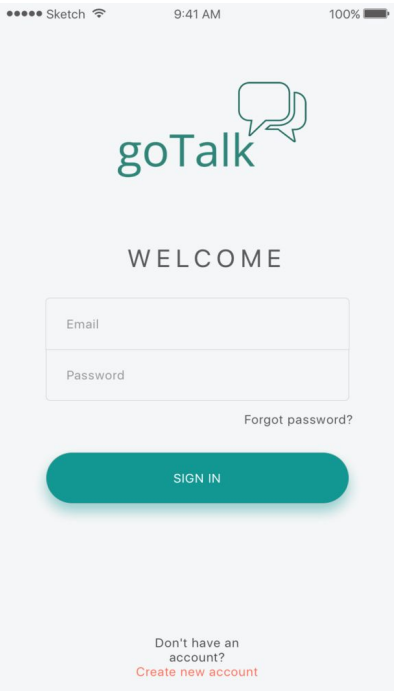

Figure 5.1.1: Login

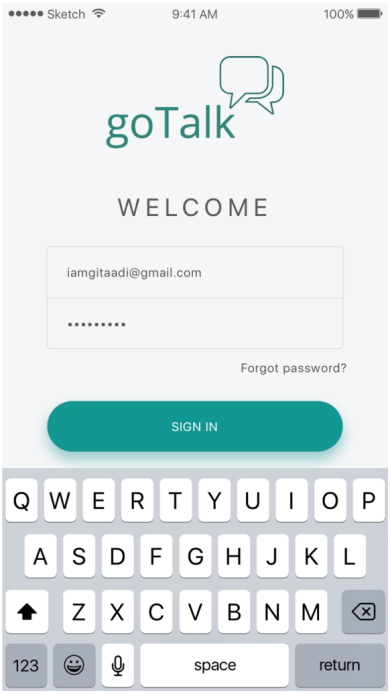

Figure 5.1.2: Typing credentials

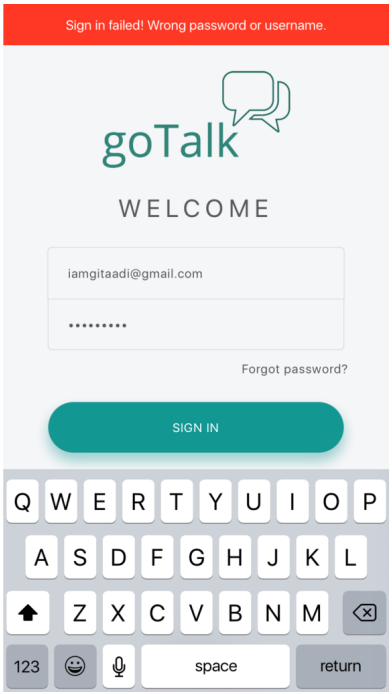

Figure 5.1.3: Sign-in Failed

If the user has an existing goTalk account, then to login, they can enter their email and password associated with the account in the two fillable fields. If either the email or password is incorrect, then a warning will appear and then you may try again.

When the user enters their information, a comparison will be made with the user data in the cloud. If a match is found, then the user is logged in.

If the user does not have a goTalk account and wishes to create a new one, then they may tap on "*Create new account*" at the bottom of the screen.

The user will be brought to a new screen where they can fill in your information: *First Name, Last Name, Username, Email Address,* and *Password*.

Tap on "*Create new account*" to register your new account with goTalk.

Upon success, you will be brought back to the Login Screen. Enter your email and password to login.

When the user registers their information, the data is uploaded and stored in the cloud, where it will be secure.

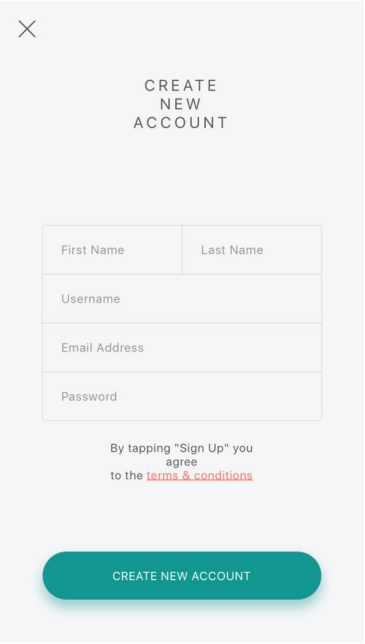

Figure 5.1.4: Creating Account

5.2) Navigating through the Home Page

The Home Page shall allow the user to navigate through the categories and pictographic buttons, and select their options accordingly. Upon logging in, users can view their favourite items automatically for quick access.

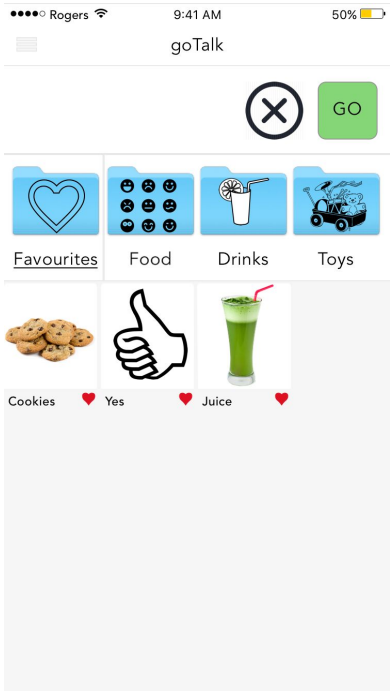

Figure 5.2.1: Favourites Category

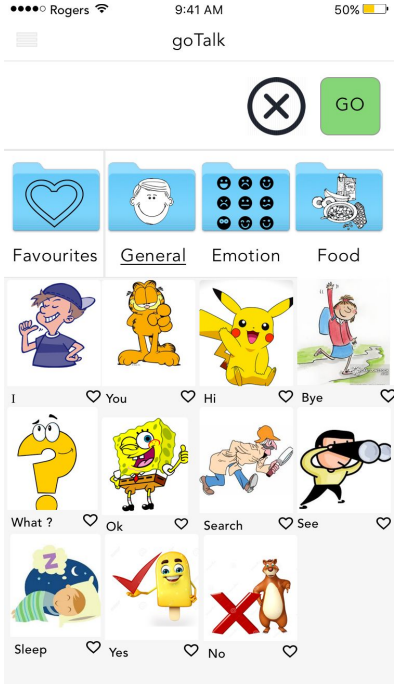

Figure 5.2.2: General Category

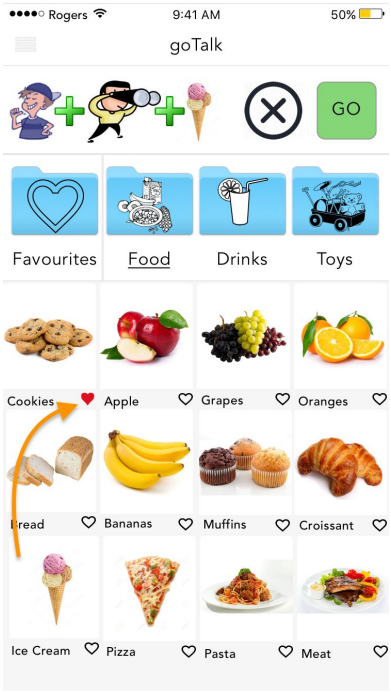

Figure 5.2.3: Adding Favourites/Display Bar

Figure 5.2.1 shows the Favourites Category which shall be the default category when the app launches. The Favourites Category shall stay pinned at all times when browsing other categories for easy access. The category that is selected will be underlined as shown above.

Figure 5.2.2 shows the General Category which displays commonly used pronouns and words. Other categories shall have a similar layout, and possess other unique buttons.

The user can add any option to the Favourites Category by simply tapping the heart icon beside the name which is shown in Figure 5.2.3.

Items are spoken by Siri in a sequential manner when the green “GO” button is pressed on the top right of the app. Figure 5.2.3 shows words added to the display bar. The display bar reads “*I See Ice Cream*.” The user can tap the “X” button, beside the “GO” to delete the most recent entry into the display bar.

5.3) Navigating to the Menu Window and Changing Settings

The user can tap on the Menu button to open up the Menu Window or side bar, which covers half the screen from the left. Using the Menu Window, the user can access the App Settings Screen via the word "*Settings*," allowing them to take control of the app and fine-tune it to their preferences. Figure 5.3.1 shows the Menu Window.

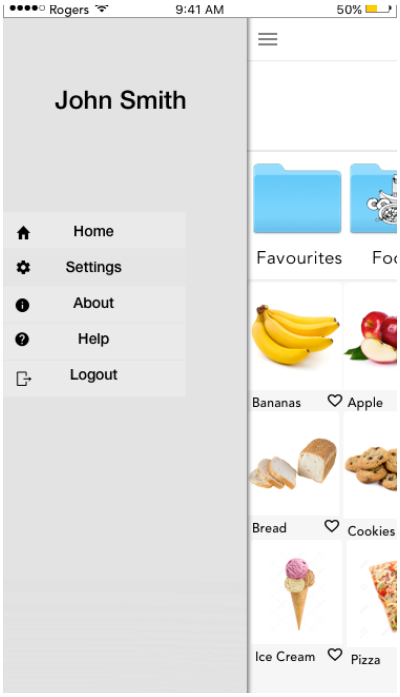

Figure 5.3.1: Menu Window

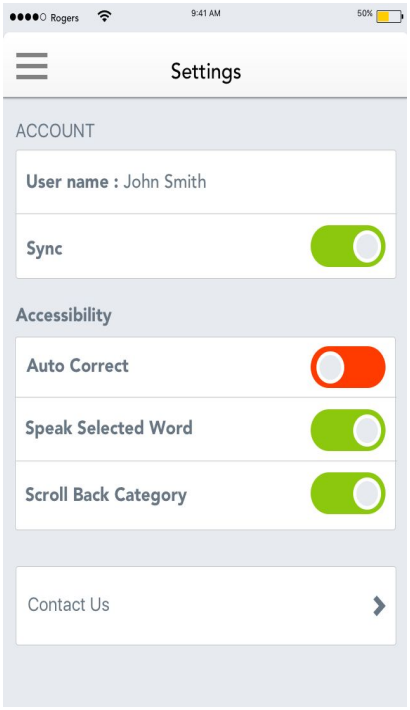

Figure 5.3.2: Settings Menu

Figure 5.3.2 shows the Settings Menu once the Settings tab has been tapped from the Menu Window. The user may enable or disable certain settings to provide a more user-centric experience.

6. Glossary

App: An application is a software program that performs a specific function. Apps generally run on computers and mobile devices.

Autism: Mental health disorder characterized by an impairment in social skills, non-verbal communication and speech, and repetitive behaviour. There is a wide spectrum (range) of autism, depending on each affected person's strengths and the challenges they face.

Configurations: A collection of initial settings and parameters used for computer programs, user applications, or system processes.

Database: Organized collection of data that can be modelled, stored, retrieved, updated, and managed.

Functional Requirements: Requirements that describe the functionality or system services of the software. In other words, functional requirements state what a system must do.

GB: Measure of computer data and memory storage (stands for Gigabyte)).

Install Size: Amount of data that must be downloaded (installed) into the device in order to use the given software.

In-App: To be included or made available within a particular app.

iOS: Mobile operating system developed by Apple Inc for mobile devices like smartphones, tablets, and smartwatches. The iOS features a user interface, software applications, and functions that the user can interact with via touchscreen.

Non-functional Requirements: Requirements that describe system properties and constraints. In other words, non-functional requirements state the limitations or constraints on resources or design.

Pictograph: Illustrative symbol representing a word or phrase.

Response Time: Amount of time taken to respond to a service request.

Menu Window: A menu bar that appears on the left side of the screen if the side bar button is pressed.

SIRI: A speech recognition AI developed by Apple Inc for the iOS operating system. (*See Voice Assistant*)

Stakeholders: A person, group, or organization that have a "stake" or interest in an organization or enterprise.

Touchscreen: Display screen that allows the user to interact with a computer or mobile device. The screen is touch-sensitive and can register the touches as instructions for the device.

User Interface: The bridge or junction between a user and a computer. The user may interact and communicate with the computer program using commands. The computer can simultaneously display or feed information back to the user.

Voice Assistant: Programmed artificial intelligence (AI) that uses language and voice recognition technology to assist the user through phones or voice recognition applications. (*See SIRI*)

7. References

[1] A. B.V., "Proloquo2Go on the App Store", *App Store*, 2017. [Online]. Available: https://itunes.apple.com/app/proloquo2go/id308368164?mt=8. [Accessed: 06- Nov- 2017].

[2] I. Care.com, "22 Best Mobile Apps for Kids with Special Needs", *Care.com*, 2017. [Online]. Available: https://www.care.com/c/stories/6621/22-best-mobile-apps-for-kids-with-special-nee/. [Accessed: 06- Nov- 2017].

[3] "Response Time Limits: Article by Jakob Nielsen", *Nngroup.com*, 2017. [Online]. Available: https://www.nngroup.com/articles/response-times-3-important-limits/. [Accessed: 19- Oct- 2017].

[4] "Higher Limit for Over-the-Air Downloads - News - Apple Developer", *Developer.apple.com*, 2017. [Online]. Available: https://developer.apple.com/news/?id=09192017b. [Accessed: 19- Oct- 2017].

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