Alternative Communication Solution for People with Autism (Can also be used by People Having Cerebral Palsy, Apraxia and Down Syndrome.)

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This Application is an alternative communication solution for people with Autism. It will also help people having Cerebral Palsy, Apraxia and Down syndrome who have difficulties in speaking. PECS (Picture Exchange communication System) is a method of communication that is designed for people with Autism, which uses cards that each contains a picture which can be put together in strings to create a sentence structure. At the moment, PECS is mainly used with physical cards. It enables people with communication difficulties to express their needs and desires to those around them by making strings of symbols.
Keywords: PECS (Picture Exchange Communication System), MVC Architectural,

I. INTRODUCTION

This application is composition of 3 phases 1. Identification phase, 2. Improvement phase, 3. Documentation phase.

A. Identification Phase:

In this phase we have used scientific Psychology methods designed with the help of various Psychologist and autism experts and designed a quiz which will be combination of specific real life situations and general behaviour questions. Guardians of people who behave in an abnormal or improper way can take this quiz and answer questions about the reaction of concerned person in specific situations and his general habits. Based on the evaluation of the answers our application will propose whether the concerned person can have autism or cannot have autism. If autism is detected, then we will ask the user to immediately consult an autism expert. This phase will be a detection of autism phase where our application will detect whether a person has high or low chances of having autism.

B. Improvement Phase:

Our application will implement the scientifically designed PEC system which is used to treat people with autism across the globe in a virtual form which will have collection of all PECS cards which can be selected to form a sentence and when each of the cards is pressed on, it will speak the corresponding phrase out from the speaker on the device thus communicating needs & desires of user to the other people. Major problem with autistic people is their communication skills and hence our application in this phase will improve their communication skills. People with autism can use this phase of the application and hence improve their condition of autism. The application will be very easy for individuals with special needs to navigate through. It will have beautiful graphics display and great voice quality, which is Ideal for children with Autism, and can be used also by people with Cerebral Palsy, Apraxia and Down syndrome.

C. Documentation Phase:

Special educational institutions are present all over the world for people with special needs. Certain concessions are also given to these people in general educational institutions. But to avail these facilities they need to have the autism certificate from the local authority. In this phase we focus on the documentation phase where we provide all the step by step procedure from which the autism certificate can be obtained. This phase will include complete set of documents that are needed, full contact details of the nearby certificate issuing authority, step by step procedure in a simplified way and all the various benefits and concessions that the autistic children can get.

II. PECS (PICTURE EXCHANGE COMMUNICATION SYSTEM)

- Example
  (when a user touches a card, sound of that card will come)

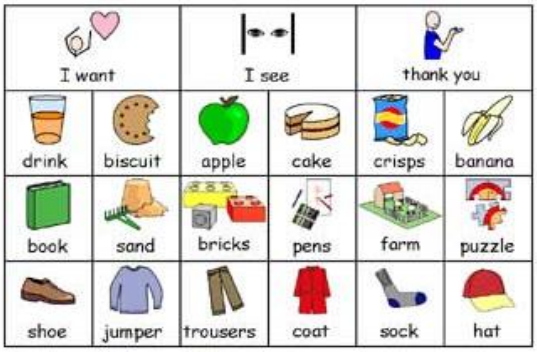

Fig. 1: Sample of PECS Sestem.

A. Technology and Methodology:

The application was designed with deep research and guidance of experts. While implementing it, all the important details of autistic people and their guardians was taken into consideration and the end result has been satisfactory and helpful. Also coding has been carried out in such a way that the correct results would be reflected on the screen. Development of the application has been done using the Android studio development kit by following the MVC Architectural Pattern. The Overall development of the application was undertaken using java, xml and the local SQL Database was used for storing the concerned resources. The logic part of the application was coded using java, while the graphical part was made using the xml coding. All the resources were stored using sql database and various libraries of android were used in the implementation of the application.

B. Implementation and Result:

The following are snapshots, which show how the project was implemented and how the result was displayed to the end-user. The following snapshots were taken through the android emulator in the android studio development kit. The application has been tested in all major versions of android and the current snapshots are in android jellybean version.

- This is the first page of our Application.

Fig. 2: Starting Page of App

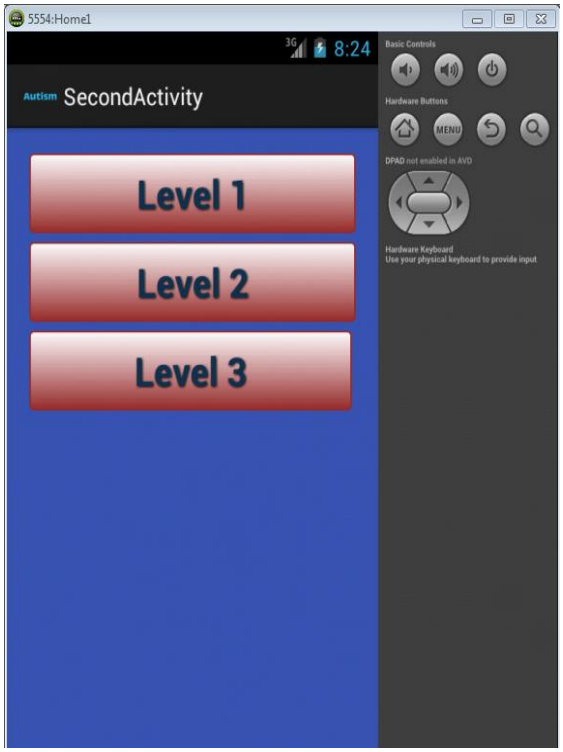

Fig. 3: Selecting the Level by Students.

- Select the particular level by clicking on the appropriate button.
- After selection of the level the below activity will display the PEC images based on the level selected

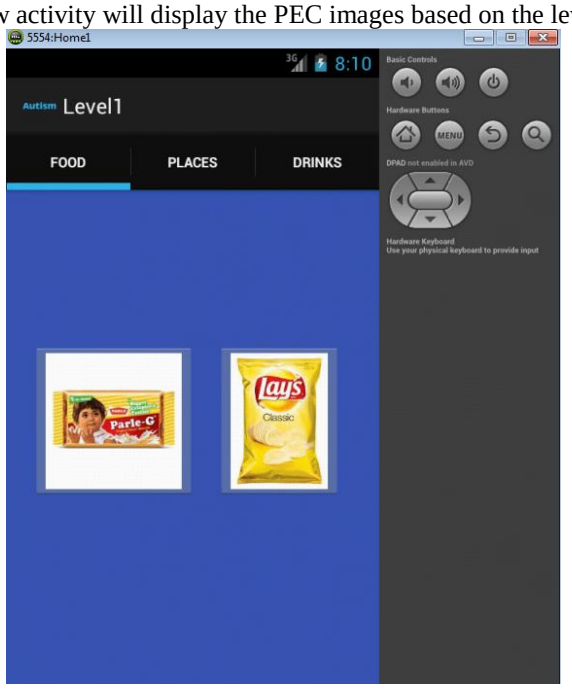

Fig. 4: Activity for Level 1 with Food tab

- Then an Activity has Different Tab on the Top to Select the Particular Tab.

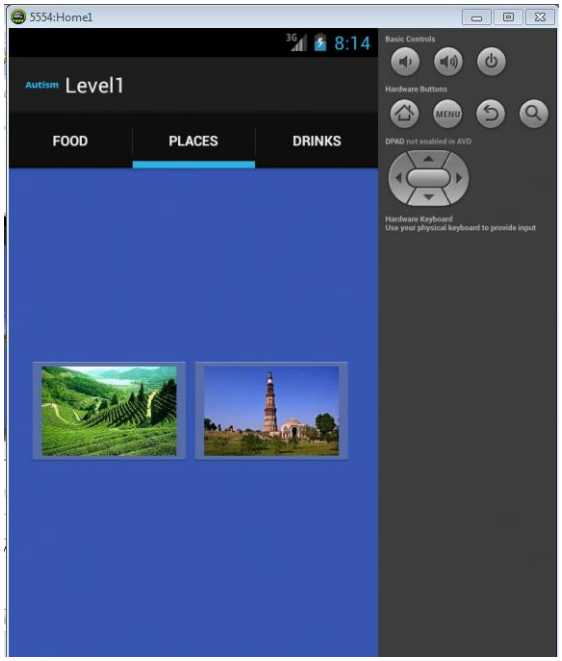

Fig. 5: Representing the Activity of Places.

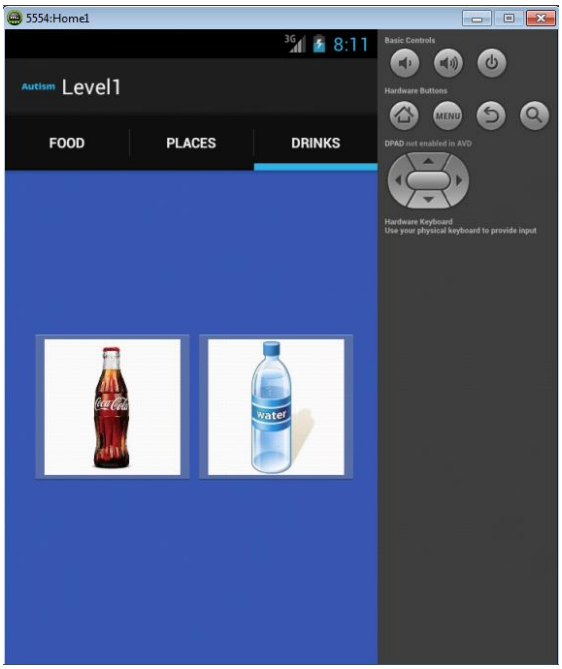

Fig. 6: Representing the activity for Drinks.

- If the User Select the Level 2 there should be 4 images will be displayed.

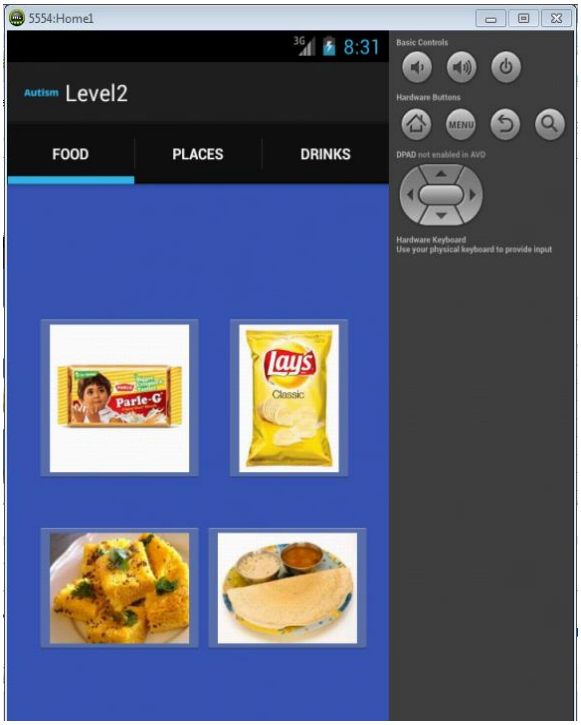

Fig. 7: Select the particular image in Food tab.

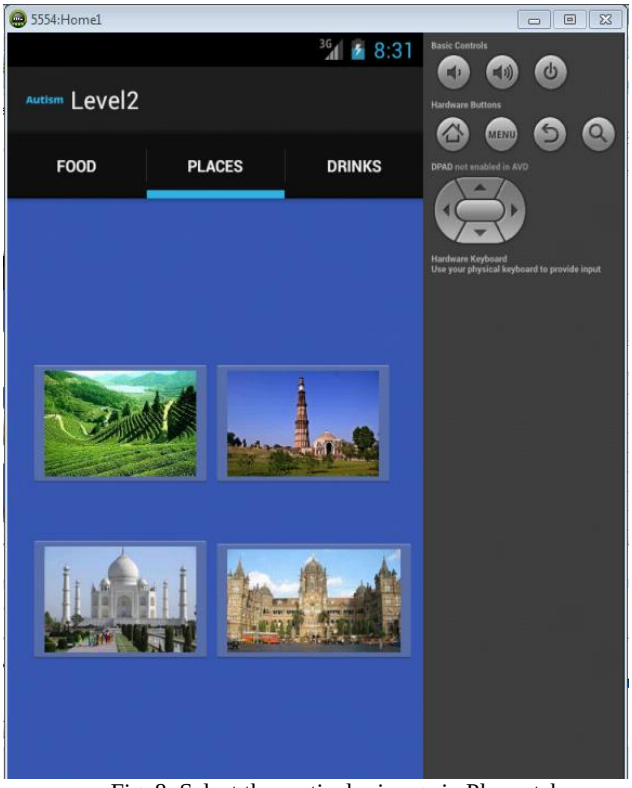

Fig. 8: Select the particular image in Places tab.

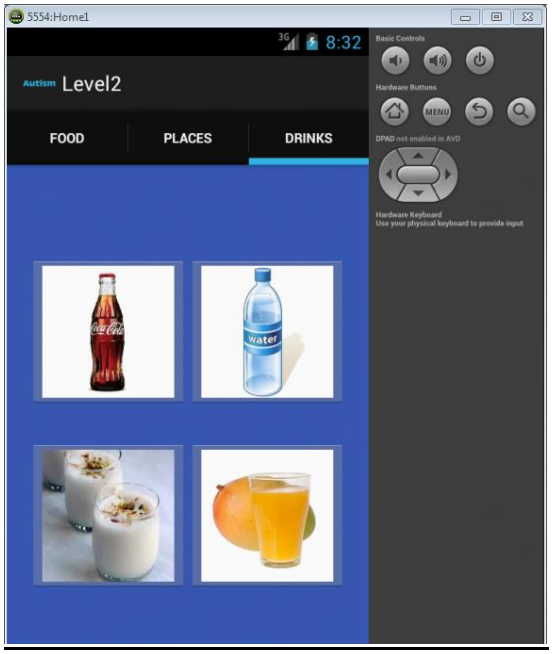

Fig. 9: Select the particular image in Drinks tab.

- At the bottom of the level 3Activity there should be search option for Automatic image generation.

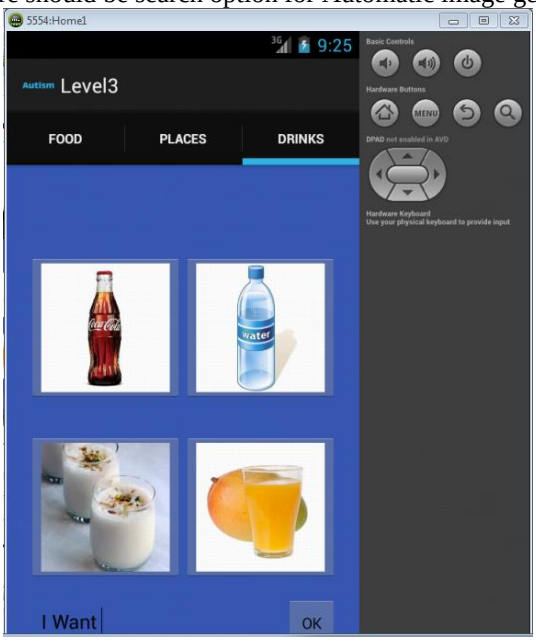

Fig. 10:

III. CONCLUSION

This paper analyses, how this project has allowed us to use the knowledge that we gained from the human machine interface, mobile communication and computing, database management system, artificial intelligence, mobile computing, web technology courses, software engineering courses with object oriented programming and android application development to implement our idea. One of the biggest skills that we will learn through the project is time-management, including the importance of planning during the early stages of development. Ideally, there will be sufficient time to implement the best suggestions and feedback into the final product and evaluate the changes. We hope our application will make a difference in the lives of children's with autism, their families & teachers. Our aim is that autistic children should use our application and improve their condition.

REFERENCES

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