Project No.01

Talking card: an embedded system for English learning

Presented by

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(……)

Advisor

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A Project Submitted in Partial Fulfillment of the Requirements
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Project Committee

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Abstract (English)

This project involves creating the device that applied to education for English learning. The purpose of this project is to provide children to learn English language, especially vocabulary and listening skill. The device was created in the scheme of arrangement of the English alphabets. In order to bring it together into one word. It will be combination to make games which is similar to hangman game.

This device including both of software and hardware parts. We use RFID card to keep the data of alphabets and micro-controller to process the whole system. The games will be in the part of software. Our device can also connect to the internet network to transfer data including the points and static data.

Abstract (Thai)

โครงงานนี้เกี่ยวข้องกับการสร้างอุปกรณ์ที่นำมาใช้เพื่อการศึกษาสำหรับการเรียนรู้ภาษาอังกฤษ วัตถุประสงค์ของโครงงานนี้คือการให้เด็กเรียนรู้ภาษาอังกฤษโดยเฉพาะเรื่องของคำศัพท์และทักษะการฟัง อุปกรณ์นี้จะถูกสร้างขึ้นในรูปแบบของการนำตัวอักษรภาษาอังกฤษโดยนำมาเรียงกันเพื่อเป็นคำศัพท์และจะมีเกมเพื่อทดสอบทักษะที่คล้ายกับเกมทายคำศัพท์ อุปกรณ์นี้จะมีทั้งส่วนซอฟต์แวร์และฮาร์ดแวร์ โดยจะนำบัตรRFID เพื่อเก็บข้อมูลของการ์ดตัวอักษรและไมโครคอนโทรลเลอร์ใช้ในการควบคุมระบบทั้งหมด ในส่วนของเกมจะเป็นส่วนของโปรแกรมซอฟต์แวร์ นอกจากนี้อุปกรณ์ของเรายังสามารถเชื่อมต่ออินเตอร์เน็ตเพื่อรับส่งข้อมูลของคะแนนรวมถึงสถิติข้อมูลที่ได้จากการเล่นเกมของอุปกรณ์เรา

Acknowledgements

Firstly, we would like to express my sincere gratitude to my advisor Asst. Prof. Santitham Prom-on for the continuous support of my bachelor's degree study and related research, for his patience, motivation, and immense knowledge. His guidance helped me in all the time of research and writing of this report. I could not have imagined having a better advisor and mentor for my bachelor's degree study.

Besides our advisor, we would like to thank the rest of our project committee: Asst. Prof. Sanan Srakaew, Aj.Kraikron and Aj.Thagorn, for their insightful comments and encouragement, but also for the hard question which incented us to widen our research from various perspectives.

We take this opportunity to express gratitude to all of the Department faculty members for their help and support. We also thank my parents for the unceasing encouragement, support and attention. We also grateful to my partner who supported each other through this venture.

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Chapter 1
Introduction

1.1 Problem Statement and Approach

In present, Language is necessary for communication especially speaking and listening. English, known as a universal language, is important for everyone to learn. In English language, some words are hard to speak and remember also have same meaning in different words. For learning English they should have been learned since childhood to be basic for communication and can be used correctly.

From above, our project will be the device for learning vocabulary and pronunciation. By this device, children can play it and have interaction with it. It will let children to think more about vocabulary and also they can try to pronounce word correctly.

From the research which we have seen, Thailand has people who can use English only 27.16 percent of Thai people. So, we would like to participate for improved English skill for Thai people.

This device will be equipment for learned English more efficiency. It will be benefit for people who want to practice pronunciation and know more vocabularies. Especially, children will get more benefit from it because it will be enjoyable for them, let them to think and also develop their learning process.

Our project belongs to potential commercial product. We focus on parent who want to buy to children. This project will create to portable device. We will make a prototype of product that can be sold.

1.2 Objectives

This device contain many words with the meaning and show the result on LCD screen. Provide children interact with this device by alphabet cards to let them pick the card to find the word and meaning. Provide children to practice listening skill using our device. Children should practice listening to English in order to memorize the pronunciation of the word more easily. Vocabulary consist of around 4000 words that suitable for children. Each words include the meaning and picture so that the children will learn and recognize more easily. Also have games to practice and using speaker to practice listening skill and enjoyable with the games.The result of the games will show on website also have information of talking card system. We hope the device can be completely prototype and actually works.

1.3 Scope

We make a prototype of talking card device that can be used for children. The device can be portable in everywhere. For the talking card system, we create both hardware and software. We design hardware for easy to use with RFID card reader system and power system with battery. The alphabet cards we use RFID smart card to store the data and sending to card reader. The main box of talking card have LCD monitor to show the result and also have command buttons to control the system. Software part, we make around 4000 words with meaning in system and create audio file from speech synthtsis to pronounce the word. The system have games to practice with GUI. This device can be connect to internet access area to show the result on web application. Parrents can know the children development by graph and score for the games.

1.4 Tasks and Schedule

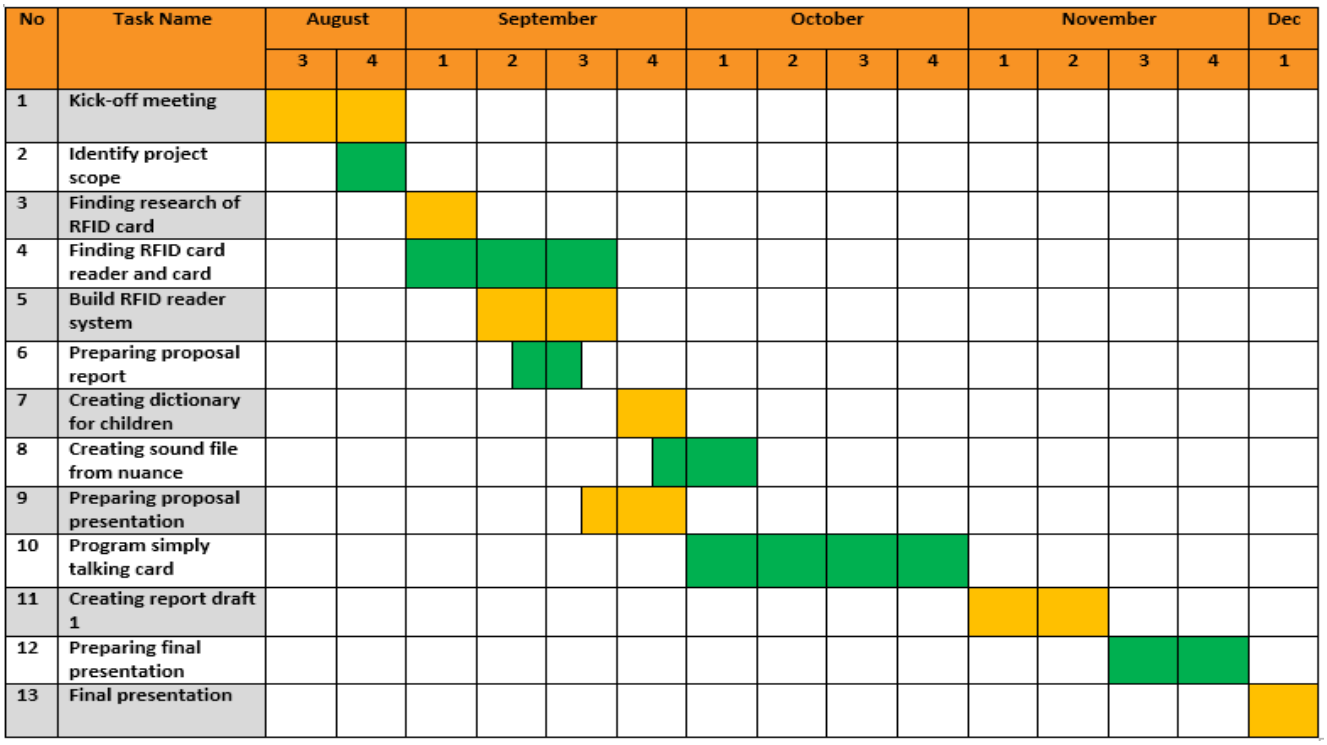

Figure 1.1 Gantt chart for Schedules and Tasks Breakdown part I

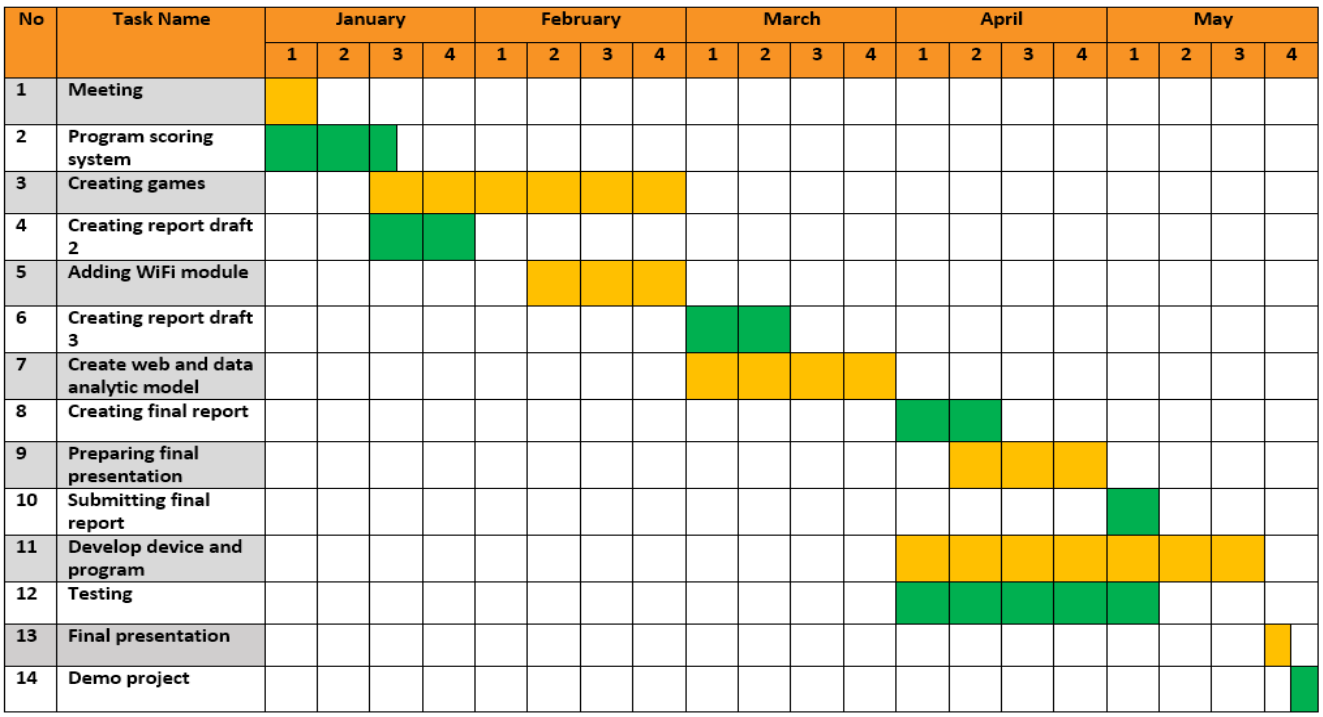

Figure 1.2 Gantt chart for Schedules and Tasks Breakdown part II

Chapter 2

Background, Theory and Related Research

2.1 Educational toy

A toy is an item that can be used for play. It's generally played with by children. Toys may be used for the development of the brain. Some toys have incidental educational, while they are known specifically by the name as "educational toys". Toys are designed with child's education and development modern than before. Because of current technology makes more variety and more comfortable. As parents and educators grow more sensitive to the recognition development needs of children, toy manufacturers seek to manufacture and market to these parents.

2.2 Childhood development

Childhood is the age between 2-12 years. They begin to recognize people, objects, and also use part of their body. Also understand the communication and learning languages. From these new things can motivate childhood to curious and playful. Childhood development contains 4 parts as following:

1. Physical part: The part of body can work fully especially the growth rate of weight and height. Gain weight cause by the growth of bone and muscle.
2. Emotional: The expression of emotion show obviously such as satisfaction, nervous, contrarily and etc.
3. Social: Social development are about a child's ability to cooperate and play with others, paying attention to parent or teacher, and making reasonable from activity.
4. Intelligence: This age like to solve the problem and think about creativity or assertive. They can understand the meaning of a new word easily. The encouragement of parent can help them to develop themselves.

2.3 RFID (Radio Frequency Identification)

RFID is the wireless use of electromagnetic fields to transfer data, for the purposes of automatically identifying and tracking tags attached to objects. RFID uses several radio frequencies and many types of tag card exist with different communication methods and power supply sources. The tag card contain chip to store data on to RFID card reader. Any RFID card contains a unique identifier (UID) and this data cannot be modified.

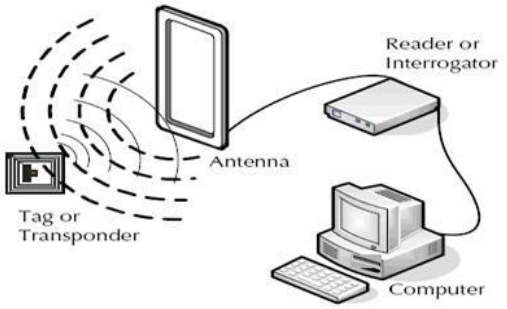

Figure 2.1 RFID system

This tag card has structured as follows:

1. Chip: The chip is pre-programmed with a tag identifier (TID), a unique serial number assigned by the chip manufacturer, and includes a memory bank to store the items' unique tracking identifier
2. Antenna coil: Transmits radio signals between the tag card and RFID reader.

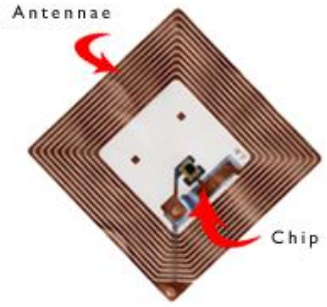

Figure 2.2 RFID TAG

Mifare classic card or ISO14443 type A

1. Feature lists:
    1.1 13.56MHz frequency
    1.2 Available with 16 byte unique identifier
    1.3 1 KB or 4 KB EEPROM
    1.4 Memory access conditions freely programmable
    1.5 Made from PVC

Figure 2.3 RFID card

RFID reader supports ISO14443A protocol. An RFID reader, also known as an interrogator, is a device that provides the connection between the tag data and the enterprise system software that needs the information. The reader communicates with tags that are within its field of operation, performing any number of tasks including simple continuous inventorying, filtering (searching for tags that meet certain criteria), writing (or encoding) to selected tags, etc.

2.4 Web server

Web server is a program that uses HTTP (Hypertext Transfer Protocol) to serve the files that form Web pages to users, in response to their requests, which are forwarded by their computers' HTTP clients. Any device can be turned into a Web server by installing server software and connecting the device to the Internet. Most web servers have features that allow the following:

1. Large data storage support: Data storage support is one of the primary feature of web server. Every web server supports large storage space for storing data of multiple websites
2. Bandwidth controlling to regulate network traffic: It is a feature available in web server to minimize excess network traffic. Web hosts can set bandwidth values to regulate the rate of data transmission over the internet. This feature avoids the down time caused by high web traffic.
3. Server side web scripting: This feature of web server enables the user to create dynamic web pages. The website will load faster. The popular server side scripting languages include Perl, Ruby, Python and etc.

2.5 HTTP Protocol

The Hypertext Transfer Protocol (HTTP) is an application-level protocol for distributed, collaborative, hypermedia information systems. It is a generic, stateless, protocol which can be used for many tasks above its use for hypertext, such as name servers and distributed object management systems, through extension of its request methods, error codes and headers. It has features that allow the following:

1. HTTP is connectionless: A browser initiates an HTTP request and after a request is made. The client disconnects from the server and waits for a response. The server processes the request and re-establishes the connection with the client to send a response back.
2. HTTP is stateless: HTTP is connectionless and it is a direct result of HTTP being a stateless protocol. The server and client are aware of each other only during a current request. After that both of them forget about each other. Due to this nature of the protocol, neither the client nor the browser can retain information between different requests across the web pages.

2.6 Python

Python is programming language similar to PERL that has gained popularity because of its clear syntax and

readability. Its syntax allows programmers to express concepts in fewer lines of code than would be possible in languages such as C++ or Java. It can used in raspberry pi.

2.7 PyGame

Pygame is a cross-platform set of Python modules designed for writing video games. It includes computer graphics and sound libraries designed to be used with the Python programming language. It is built over the Simple DirectMedia Layer (SDL) library, with the intention of allowing real-time computer game development without the low-level mechanics of the C programming language and its derivatives. This is based on the assumption that the most expensive functions inside games (mainly the graphics part) can be abstracted from the game logic, making it possible to use a high-level programming language, such as Python, to structure the game.

2.8 CSS

CSS stands for Cascading Style Sheets. CSS is used to define styles for your web pages, including the design, layout and variations in display for different devices and screen sizes. CSS saves a lot of work. It can control the layout of multiple web pages all at once. External stylesheets are stored in CSS files.

2.9 PHP

PHP is probably the most popular scripting language on the web. PHP stands for is "Hypertext Pre-processor". It is used to enhance web pages. With PHP, you can do things like create username and password login pages, check details from a form, create forums, picture galleries, surveys, and a whole lot more. If you've come across a web page that ends in PHP, then the author has written some programming code to liven up the plain, old HTML. PHP can be a server side programming language. When a user requests a web page that contains PHP code, the code is processed by the PHP module installed on that web server. The PHP pre-processor then generates HTML output to be displayed on the user's browser screen.

2.10 Javascript

JavaScript is a programming language used to make web pages interactive. It runs on your visitor's computer and doesn't require constant downloads from your website. JavaScript is often used to create polls and quizzes. JavaScript uses some of the same ideas found in Java, the compiled object-oriented programming derived from C++. JavaScript code can be imbedded in HTML pages and interpreted by the Web browser (or client). JavaScript can also be run at the server as in Microsoft's Active Server Pages before the page is sent to the requestor.

2.11 MySQL

MySQL is an open source relational database management system. It runs as a server and allows multiple users to manage and create numerous databases. It is a central component in the LAMP stack of open source web application software that is used to create websites. LAMP stands for Linux, Apache, MySQL, and PHP. Most WordPress installations use the LAMP stack because it is open source and works seamlessly with WordPress.

2.12 HTML (Hypertext Markup Language)

HTML is markup language which uses to create web pages. It can use with many languages such as: CSS, JavaScript, etc. HTML is the structure of web pages which use another language for decorate and make it to be interactive web pages.

2.13 Speech Synthesis (Nuance)

Web services for speech processing which can recognize or synthesize sound. It has services for developer to develop their program in many features such as: IOS, Android, etc.

2.14 Google map API

Google Maps is a Web-based service that provides detailed information about geographical regions and sites around the world. In addition to conventional road maps, Google Maps offers aerial and satellite views of many places. In some cities, Google Maps offers street views comprising photographs taken from vehicles. Google Maps APIs lets developers embed Google Maps on webpages using a JavaScript or Flash interface. The Google Maps API is designed to work on mobile devices and desktop browsers.

2.15 Hardware components

We use Raspberry pi 2 model b+ in system. The Raspberry Pi is a small single board computer stamped with chips and I/O connectors. It is a low-cost computers and free software to students. The Raspberry Pi 2 Model B is the second generation Raspberry Pi, which is more useful for embedded projects and projects which require very low power.The specification are

1. A 900MHz quad-core ARM Cortex-A7 CPU
2. 1GB RAM
3. 4 USB ports
4. Ethernet port
5. Micro SD card slot
6. 40 GPIO pins
7. Combined 3.5mm audio jack and composite video

Figure 2.4 Raspberry pi 2 model b+

RFID card reader (RC522) read Mifare card and connect to raspberry pi on GPIO pins.The specification are

1. SPI interface
2. ISO 14443 standard/Mifare card
3. Transmission 106KB/sec
4. 3.3V current
5. Operating 13.56MHz

Figure 2.5 RFID card reader

Mifare classic card 1k (RFID card). It is contactless smart card with memory storage device. The memory is divided into segments and blocks with simple security mechanisms for access control.

Figure 2.6 Mifare card

LCD monitor: A monitor to connect with raspberry pi 2 and display user interface. The specification are

1. HD 7 inch screen size
2. RGB 800x400 ratio 16:9 (width: height)
3. Suitable for raspberry pi
4. 9-12V current

Figure 2.7 Monitor

Speaker have 2 side (left right). The specification of speaker are

1. Output Power P.M.P.O. : 450W
2. Output power (RMS) : 1 watts x2
3. Frequency response : 80Hz-20kHz
4. Controls : Master voloumn, Headphone jack

Figure 2.8 Speaker

Push button and switch: There are control the function of a device such as menu, arrow up, arrow down, volume and etc.

Figure 2.9 Controller buttons

On-Off Switch (for 12 V include LED)

Figure 2.10 Power buttons

USB Wi-Fi adapter: To connect the network in wireless on raspberry pi. The specification are Raspberry Pi / Pi2 Supported and also supports 150 Mbps 802.11n Wireless data rate. Using USB 2.0 port.

Figure 2.11 USB Wi-Fi adapter

Battery Li-ion 18650 and Adaptor: It is power supply to the system. Battery Li-ion has 6800 mAh 12VDC and adaptor 12VDC to charge a battery. Li-ion battery is a rechargeable battery with twice the energy capacity of a Nickel-Cadmium battery and greater stability and safety.

Figure 2.12 Battery

Step down DC to DC: To convert voltage 12 volt into 5 volt. Input voltage: 4V-35V, Output voltage: 1.23V-30V.

Figure 2.13 Step down DC

Parallel port we use female to female in 1m. to connect between card reader and mainbox.

Figure 2.14 Parallel cable

Electronic Box: Size is 302mmx265mm(widexhigh) x High 47-82mm

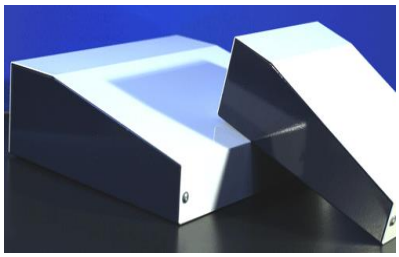

Figure 2.15 Electronic box

Reader Box: Size is 255mmx120mm

Figure 2.16 Reader box

2.16 Related Products

Figure 2.17 Matching Letter toy

Matching letter toy have vocabulary cards, alphabet tiles to let user think a word from picture. The problem, we found that device has only 5 alphabet tile slots which it will have a few of vocabulary. For example: It will do not have word “elephant” which contain 8 letters.The vocabulary will be repeatedly for children.Children are hard to practice speaking word.

Figure 2.18 Smart Learning Board toy

Smart Learning Board toy contains learning board that can pronounce the word. Click on the button to listen words and numbers. The problem has a limit word and children will get bored easily. It’s suitable only for small children

Figure 2.19 Y-Pad toy

Y-Pad toy Y-Pad toy contains a list of English and Thai alphabets and number. This device can click for listen words, number, and songs. It can change language. We found problem that it has limited word

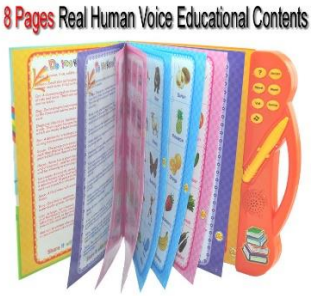

Figure 2.20 Learning English interactive toy

Learning English interactive toy contains smart page can be write on the device. Feature is to click for listen words. Problem that it has a limit word.

Chapter 3

Design and Methodology

3.1 Model Design

Our model design, we would like to make in a portable device and also have the LCD monitor to show the result. The monitor should be rotated up and down. It contains command button, Monitor, switch, speaker and parallel port

Front side

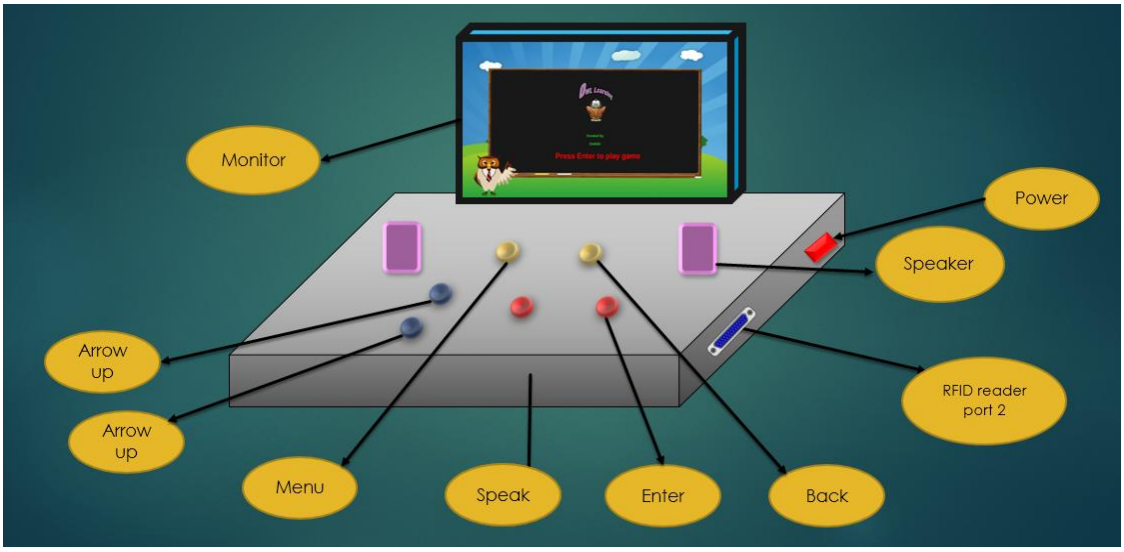

Figure 3.1 Model design

Back side

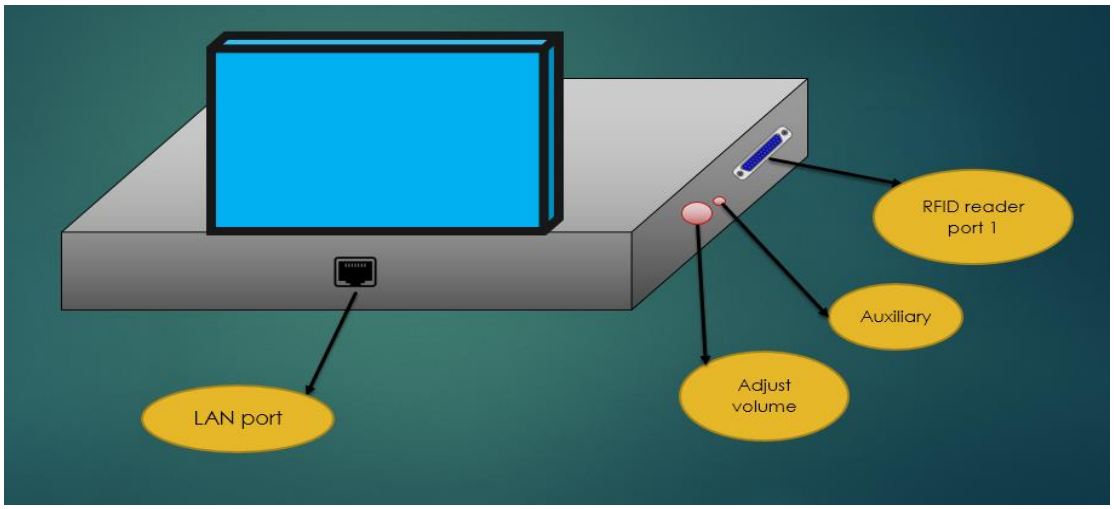

Figure 3.2 Model design (Back side)

Reader front side

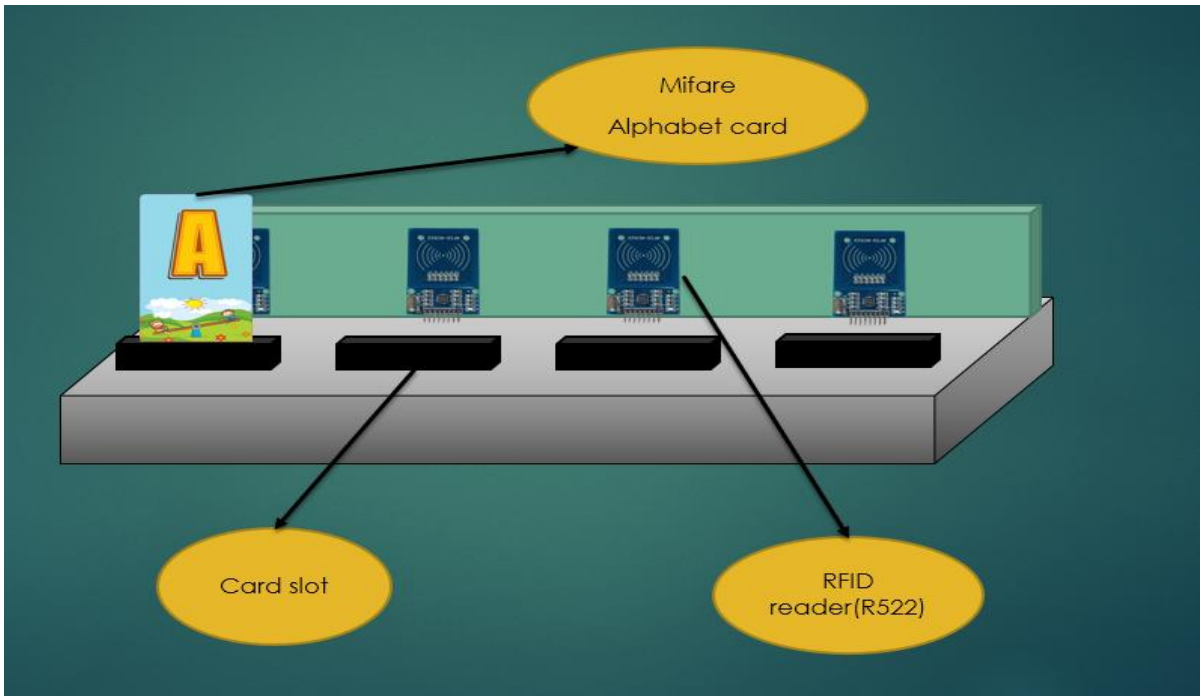

Figure 3.3 Reader Design

Reader back side

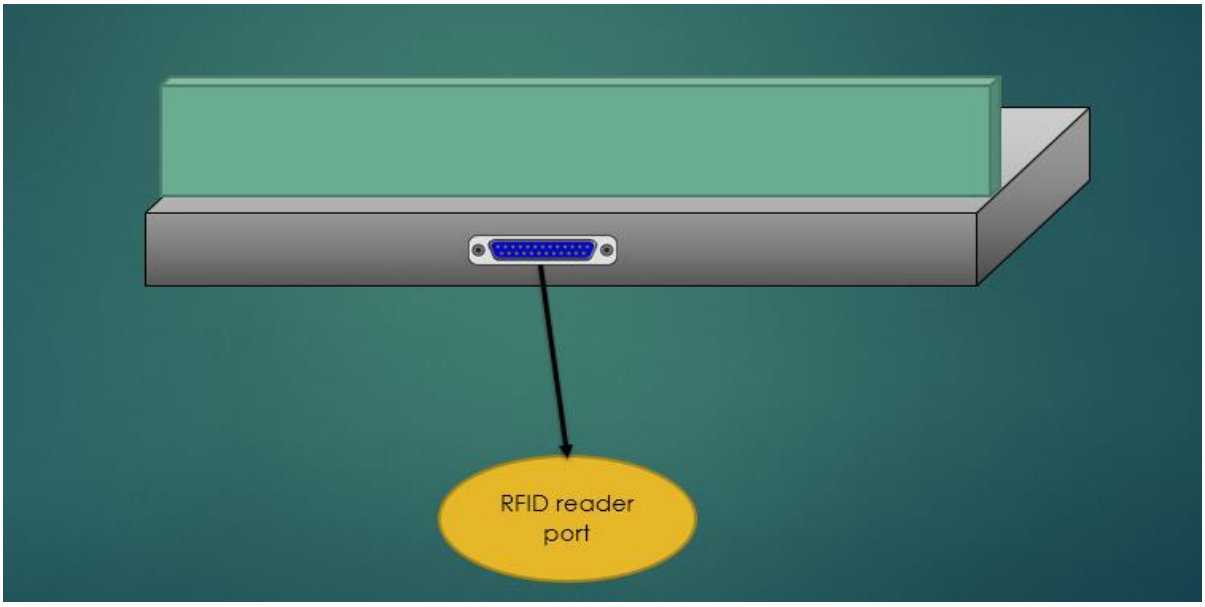

Figure 3.4 Reader Design (Back side)

Alphabet card

Figure 3.5 Alphabet card

3.2 Components

Figure 3.6 Components

3.3 Components Diagram

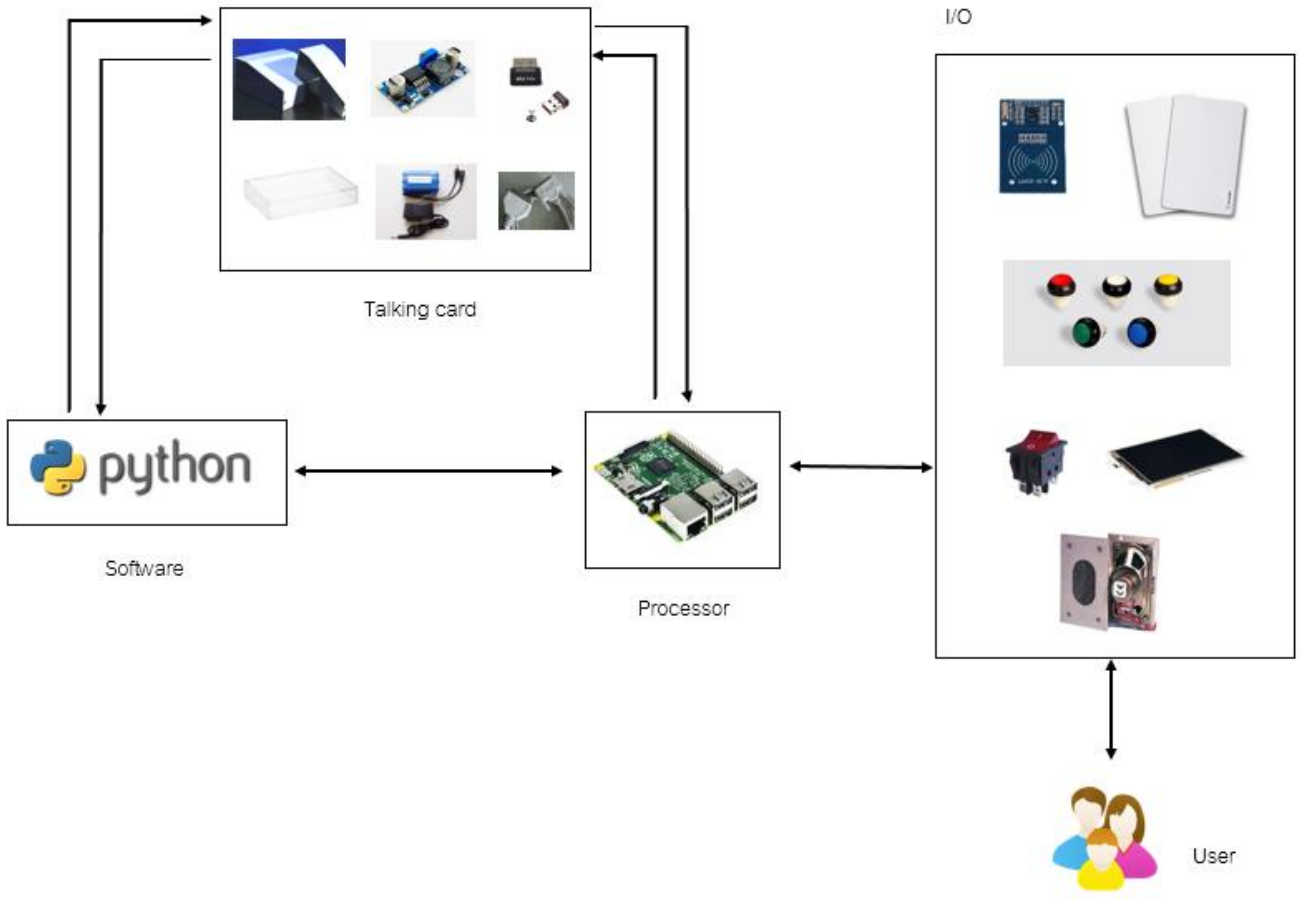

Figure 3.7 Components diagram

Components diagram is used for briefly explain our workflow of every unit that works together. Phython is a programming language to use for create talking card software and we use rpi to processing. Also connect to power supply and WIFI adaptor. Input /Output are LCD, Speaker volume, Mifare card, Command button Rc522.

3.4 Software diagram

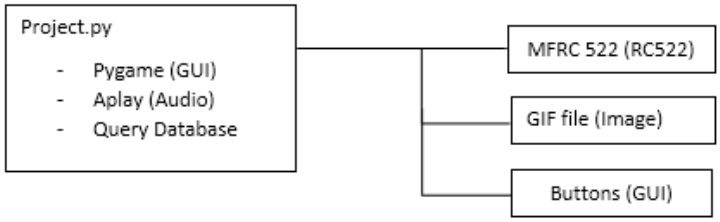

Figure 3.8 software diagram

The main of software that we use is Python. We apply data or the audio of speech and also query the database. All of the system have GUI including GIF Image and receive data from RC522.

3.5 Block Diagram

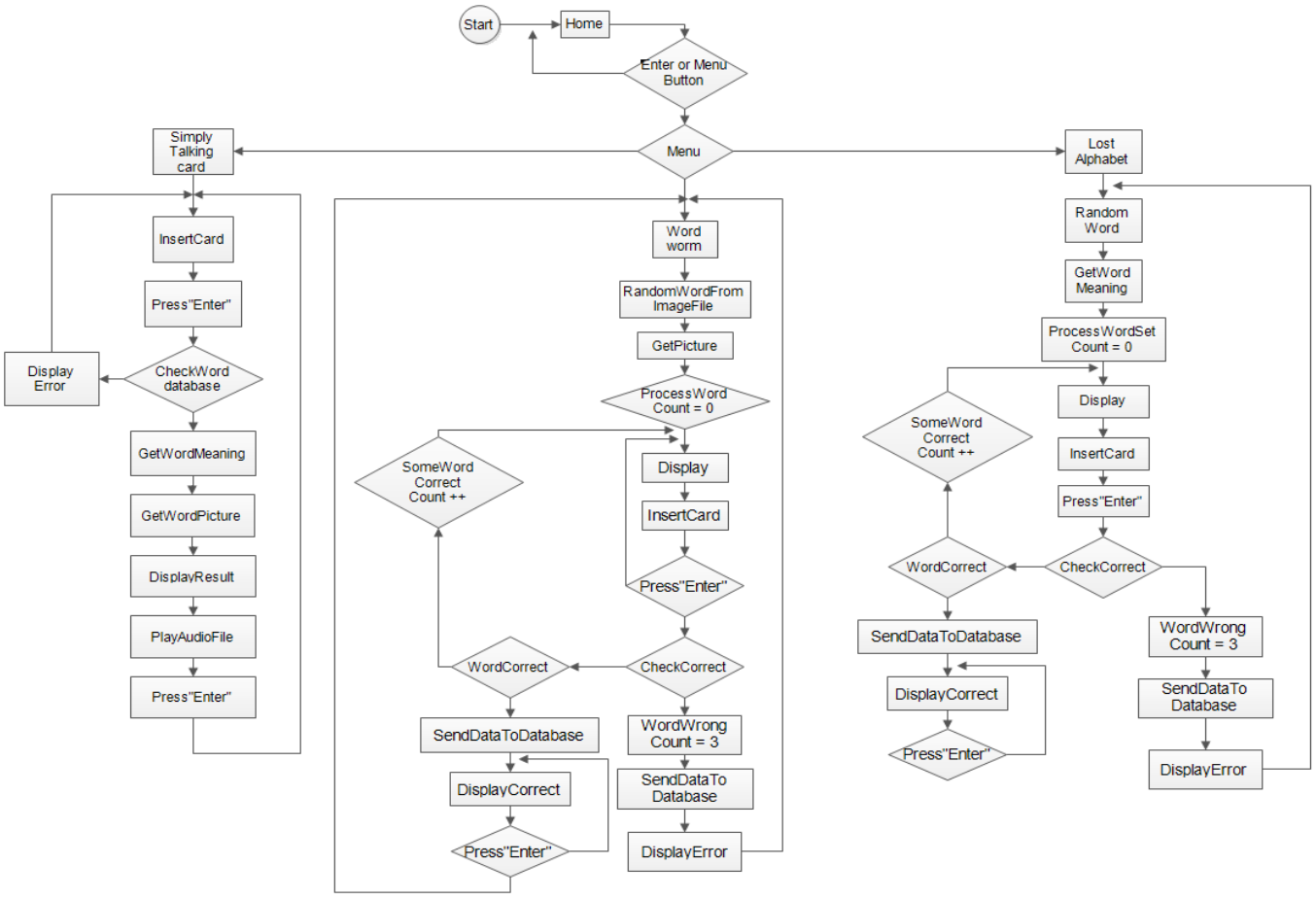

Figure 3.9 Block Diagram

3.6 RC522 work flow

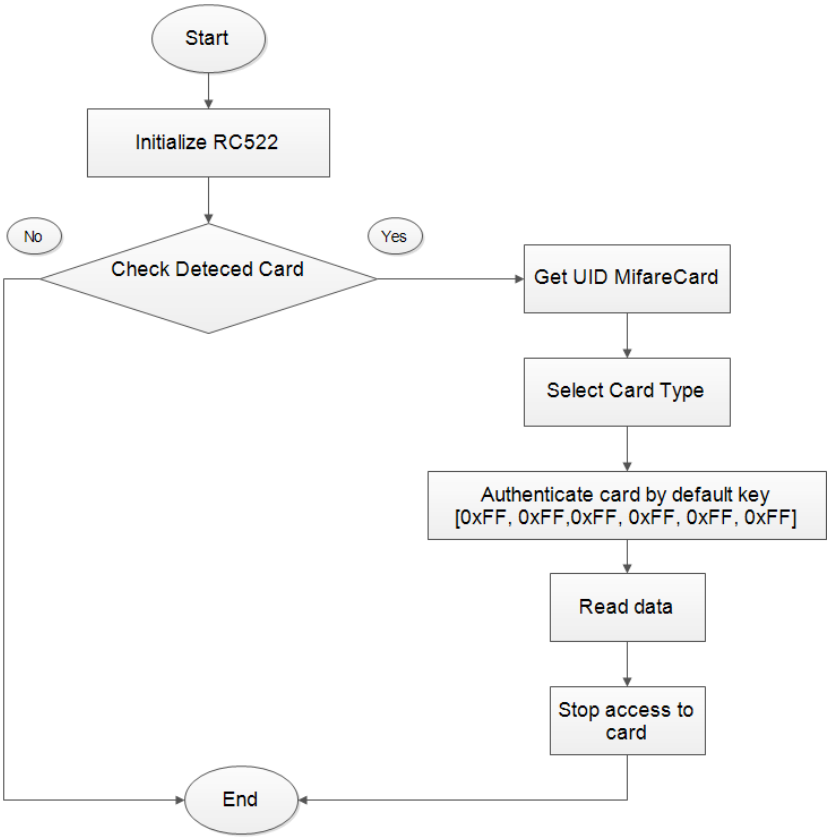

Figure 3.10 RC522 work flow

3.7 Feature list

Program Part of the device have 3 mode as following:

1. Simply talking card – It is basic feature by read card and pronounce a sound
2. Lost Alphabet game – This mode is a game for fill missing alphabet
3. Worm picture – This mode is a game for think a word from picture

Web page have 10 pages consist of Login page, Sign up page, Forget password page, Change password page, Home page, Activity log page, View result page, Graph development page, About Us page and Contact us page on each page mode is described as following:

1 Login page is the web application allows user to enter a correct username and password in login

2 Sign up page: Allow user to create a new account with a device ID

3 Forget password page: When user forget password, the page will ask for an email to send the details for evidence.

4 Change password: Allow user to change the password to be safety

5 Home page: After user enter a correct username and password, the web application will display home page. This page allows user to observe system information.

6 Activity Log: Allow user to look back information of the words that they found. In the table will show the date, time to play, type of games, the words and score.

7 View result page: Allow user to know the game result and score for each level. Each the table contains the correct and incorrect word and distinguish by grade level.

8 Graph development page: This page will show the graph development from the result to show children improvement.

9 About Us page: Our information

10 Contact us page: Contact located area.

3.8 Software & Games

Simply talking card

Children can select any alphabet cards that should be a word such as CAT. They should insert the card into slot by arranging from left-right and then press enter. If it has matched word in database then on the screen it will show result as a word 'CAT' with picture and the meaning. Also has a sound pronounce like C A T "Cat".

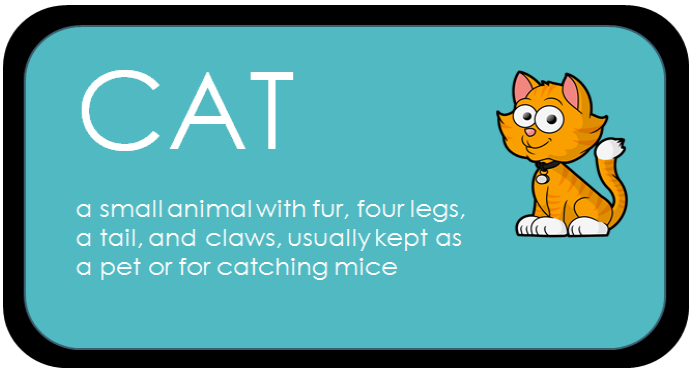

Figure 3.11 Simply talking card screen example

Lost alphabet game

It is a game that already shows a word and meaning. The word is replaces some alphabets with blank space. Child should input the cards of alphabet to blank space. After user inserted, user has to push button "Enter".

Figure 3.12 Lost alphabet quiz screen

Worm picture game (worm word)

The game will displays picture and first alphabet with blank space to let user insert alphabet card to correct the questions. Also has a hint that is a sound pronounce for this word.

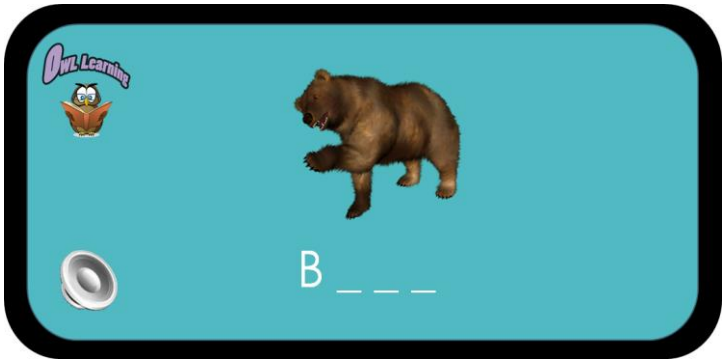

Figure 3.13 Worm picture quiz screen

3.9 Architecture diagram

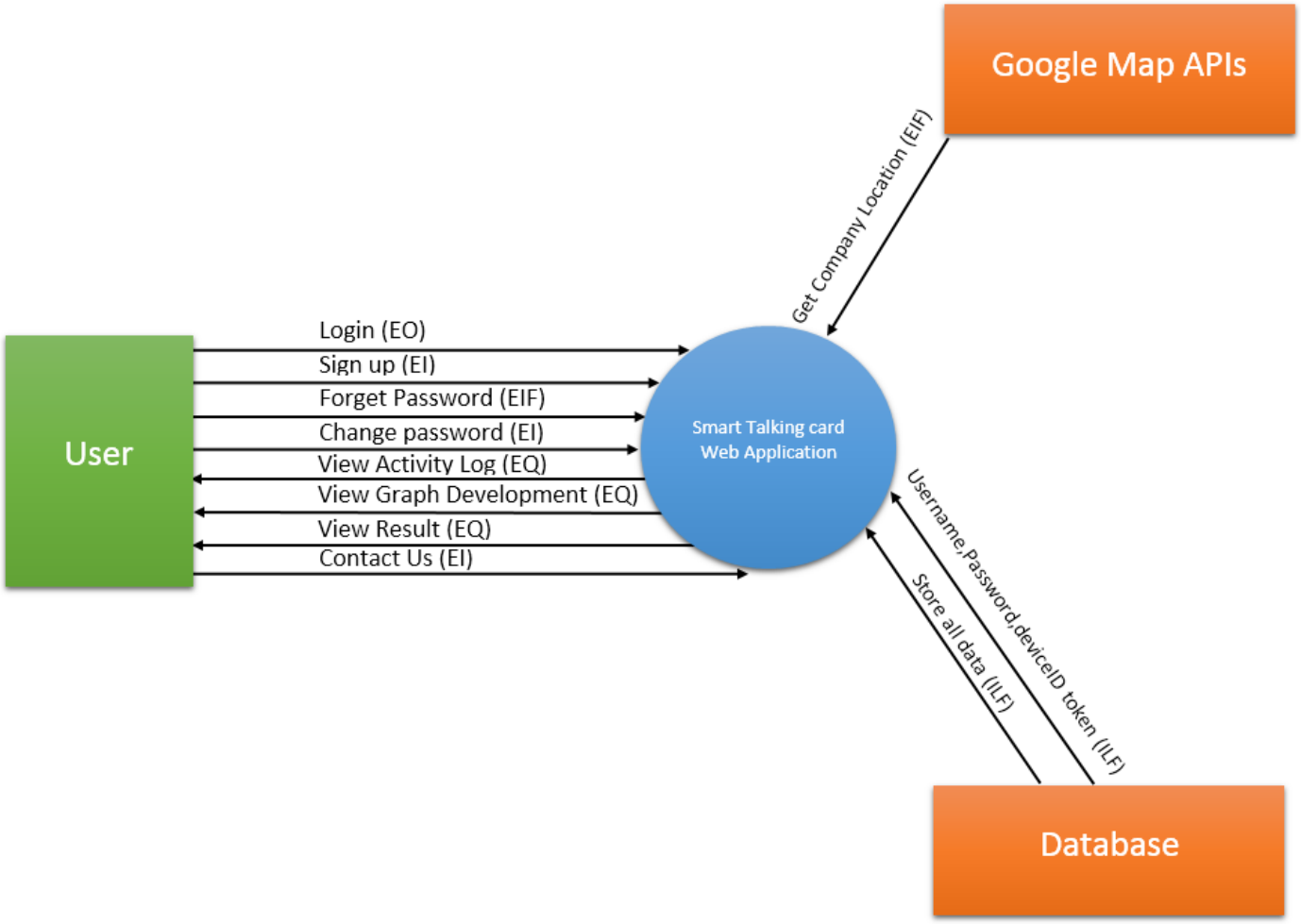

Figure 3.14 Architecture diagram

Smart Talking application connect with user,database and Google map APIs. User can sign up, login,change password,forget password,view activity,view grapg,result and contact us. Database store date from user. Google map APIs show location of our company.

3.10 Use case diagram

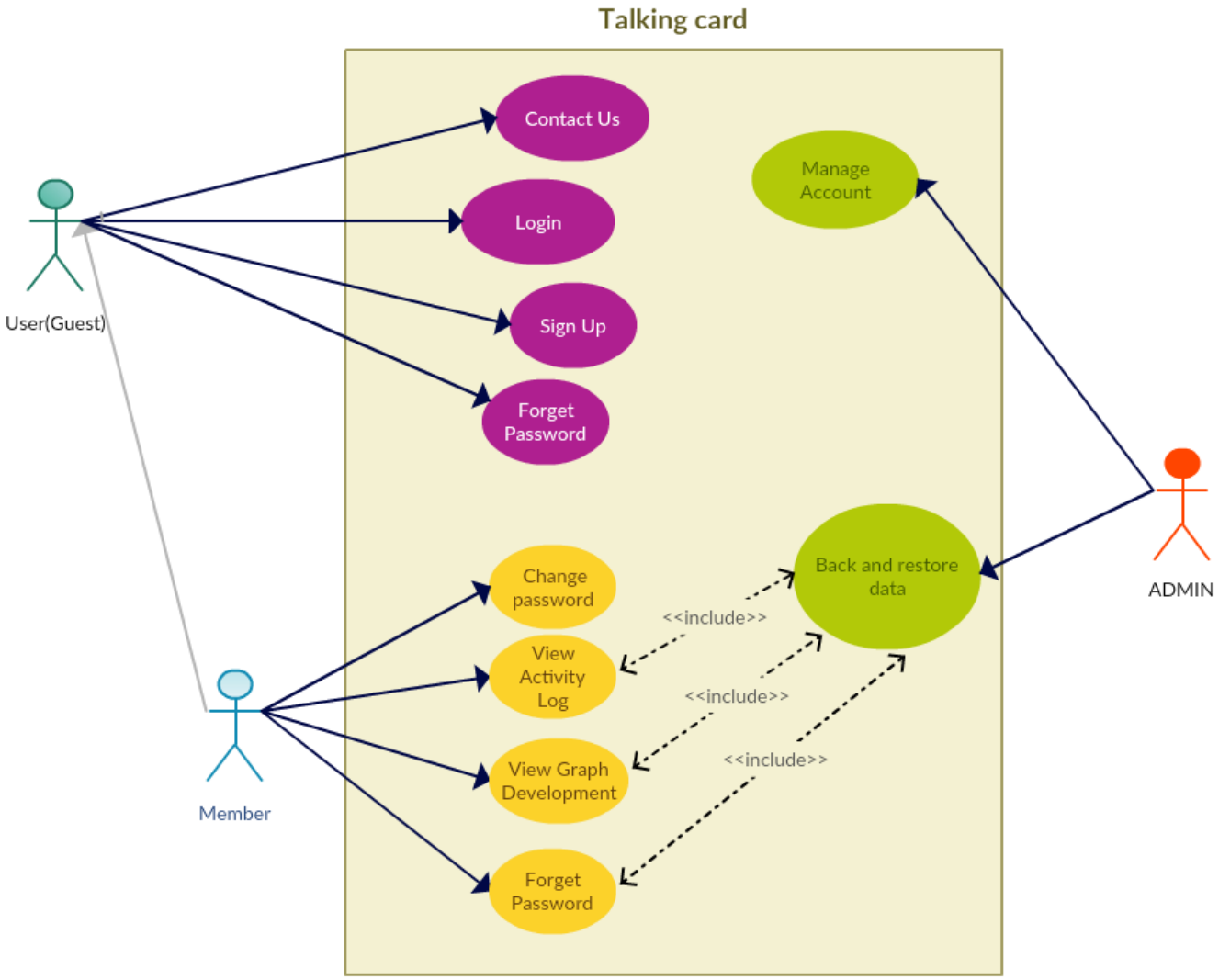

Figure 3.15 Use case diagram

User(Guest) can view the website and also sign up for the member if user(Guest) have our device. Member can sign up and they can view the result of the game activity in talking card with Graph. Admin can manage all of user and also back up and restore the member and user data

3.11 Navigation map and sitemap, for web applications

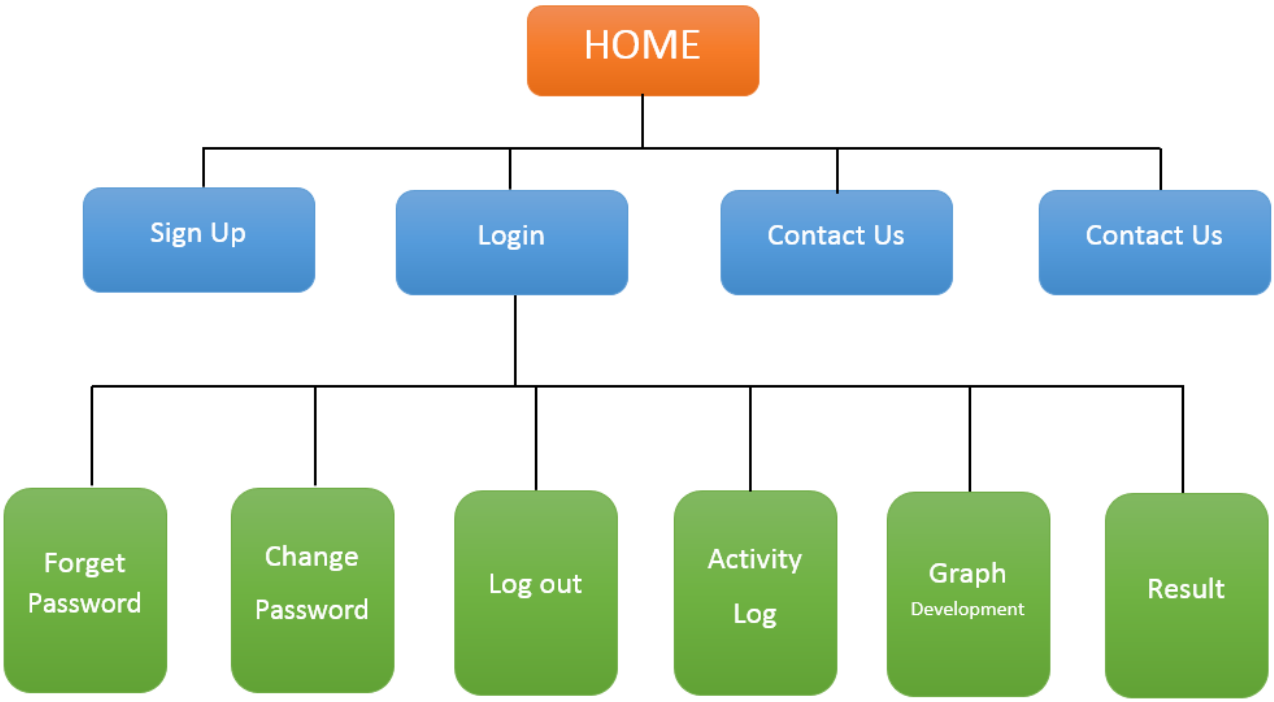

Figure 3.16 Navigation map of web application

3.12 Protocol design description

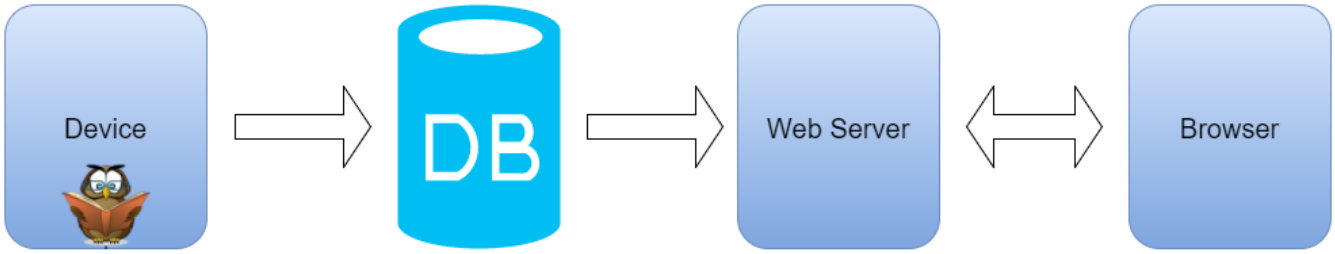

Figure 3.17 Protocol design

Device will send data to database of web server. Web server get data from database and process to get result for show in web browser. Browser (Client) send request to web server and web server send information back to browser.

3.13 Database schema

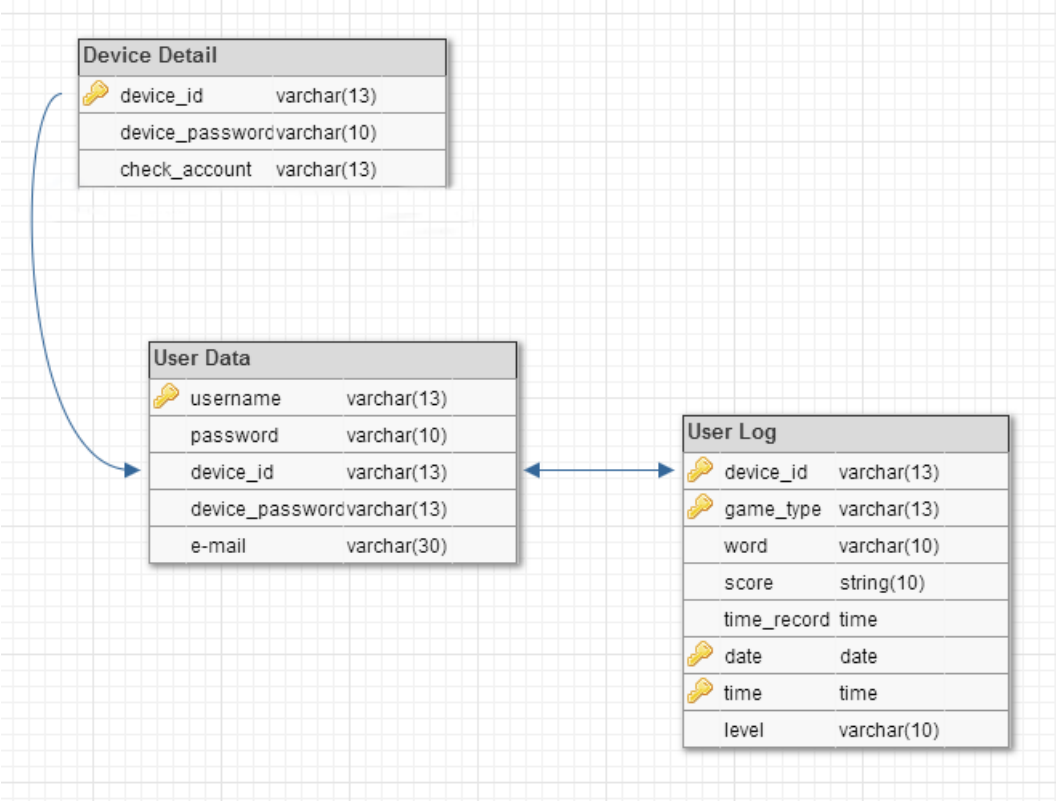

Figure 3.18 Database Schema

Database system details as a following:

1. device_id is primary key which this attribute will store id of each device.
2. device_password is attribute for verify device_id.
3. username is attribute which user has set to log in to web pages.
4. password is attribute for secure the account which can contain token, alphabet, and number.
5. email is attribute is for send the password to e-mail which user has given from signup if user forget their password.
6. check_account is attribute to limit the member of each device which cannot more than 2 account.
7. game_type shows type of 3 games (simply,lost alphabet and worm picture)
8. word is attribute for tell vocabulary that children has been learned.
9. score is attribute to tell the correctness of vocaburaly which play in lost alphabet and worm picture.
10. time_record is attribute for tell when they play game.
11. date is attribute for tell what day children play game.
12. time is attribute for tell how much time that children has used in each game.

13. level is attribute for tell level of the word which has refered from academic dictionary for student.

3.14 Device Schematics

This is an overview of talking card system. Raspberry pi is a main part to control the system. GPIO port is connected to card reader with SPI interface and command buttons. LCD monitor connect to the display port. Speaker connect to audio port. USB WIFI adaptor connect to USB port. Also have battery li-ion to play in everywhere.

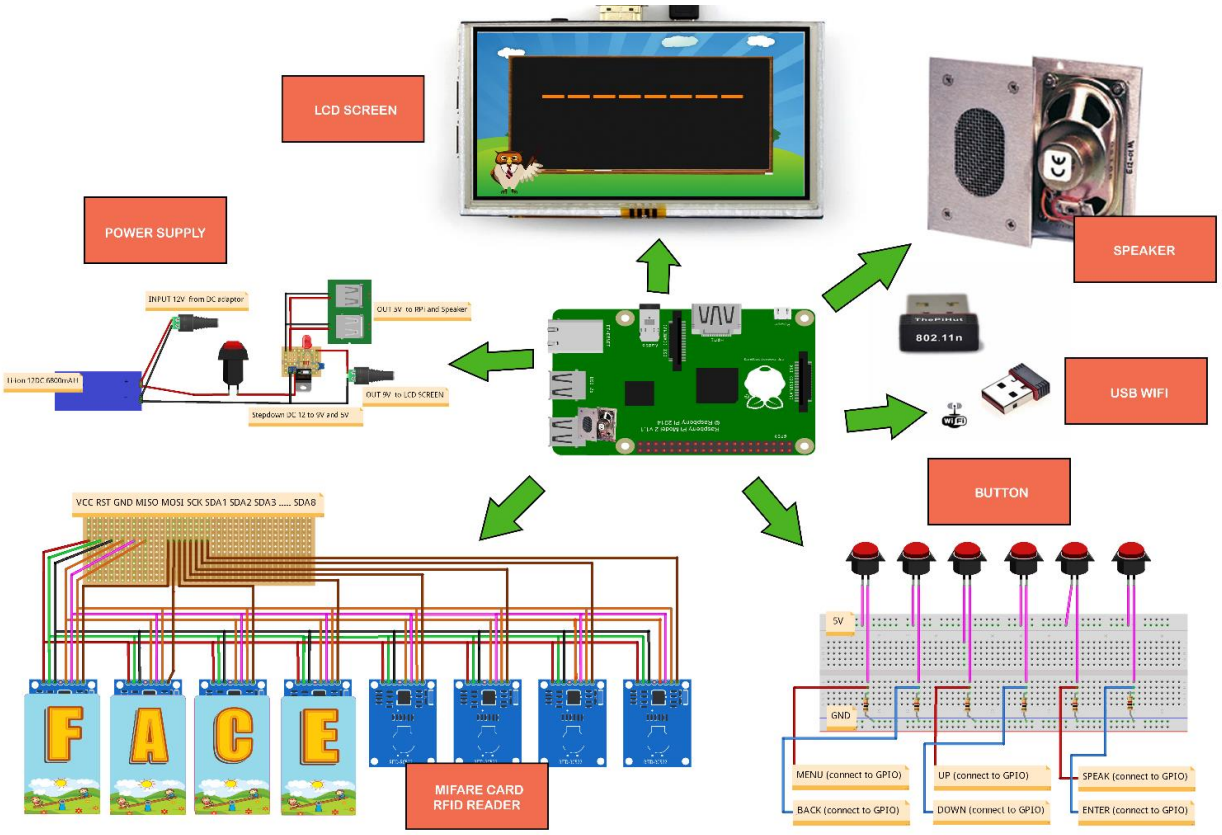

Figure 3.19 Device Schematics

Multiple RFID card readers with SPI interface

1 RC522 connect together with 8 readers on SPI interface

- VCC : Power source 3.3V
- RST : Reset input value
- GND : Ground

2 SPI interface

- SCLK (Serial Clock): A clock signal from the master device to the slave device to set for the data transmission.
- MOSI (Master Out Slave In): Send data from the device to the Master and Slave
- MISO (Master In Slave Out): Receive data from slave
- SS or SDA (Slave select): Send low signal to select slave

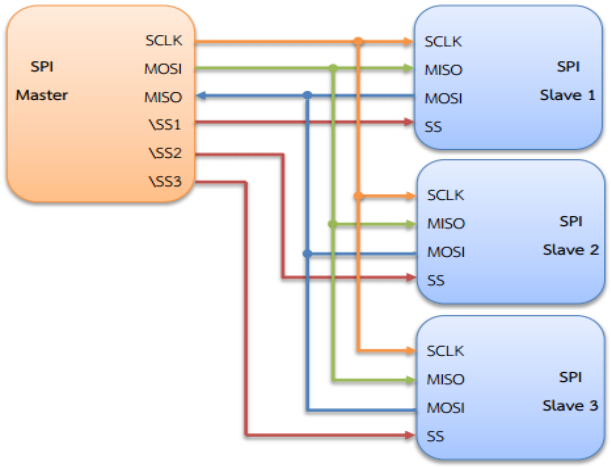

Figure 3.20 SPI Schematics

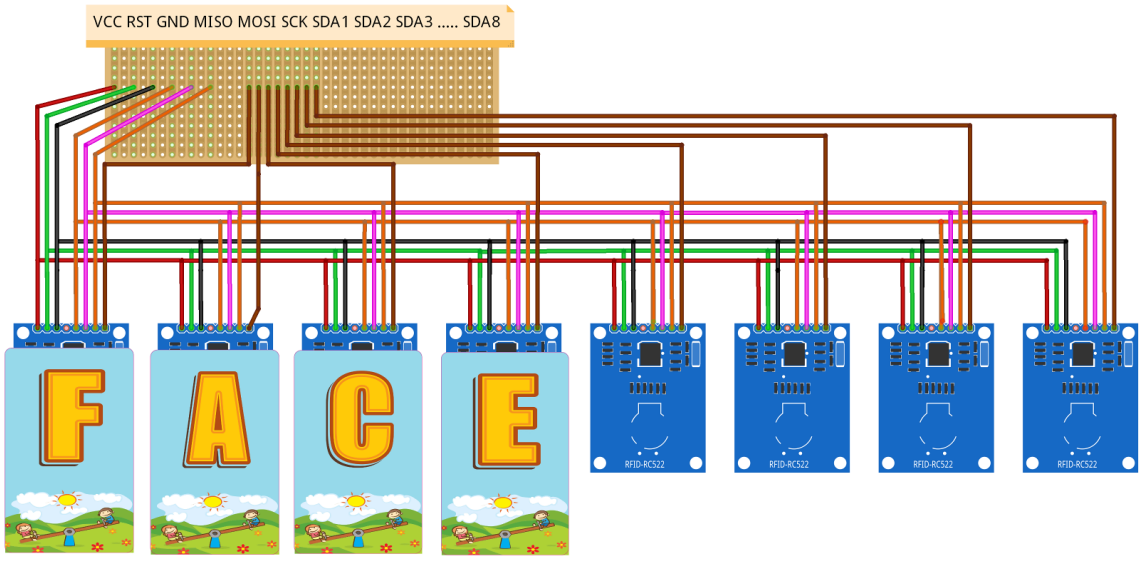

Figure 3.21 RFID reader schematic

Command button

1. Using push button with push on,release off.
2. Using 5V on raspberry pi board and connect currents protection with resistor 1k to the ground.
3. The command signals connect to GPIO pins on raspberry pi.

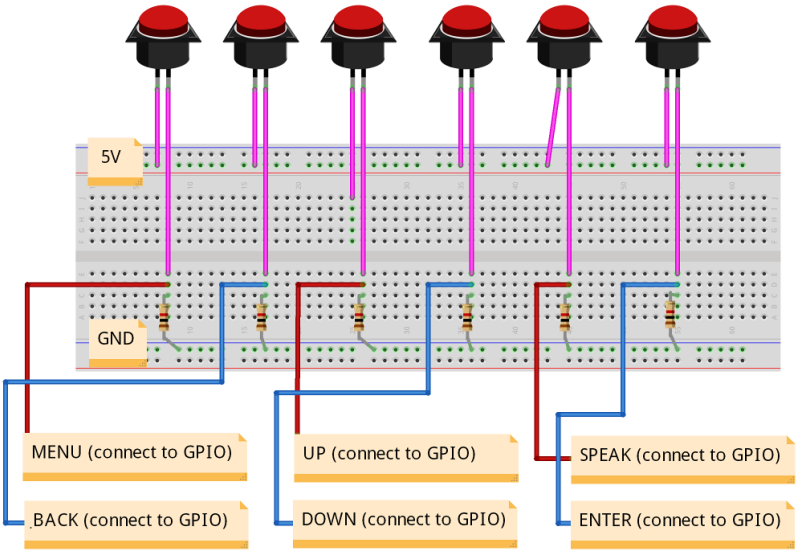

Figure 3.22 Command buttons schematic

Power Supply

1 Using Li-ion (lithium ions) battery 12V DC.

2 Using adaptor 12V DC to charging the battery and Peak-detecting currents when full battery.

3 The On-Off switch controll electric currents between battery and step down DC module.

4 The output have 3 ports (9v and 5v) to connect to rpi, speaker and LCD monitor.

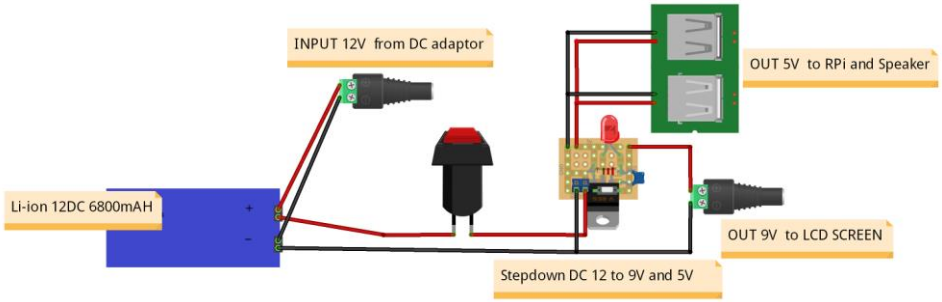

Figure 3.23 Power supply schematic

Chapter 4

Results and Discussion

4.1 Model

In model design, we have 3 main part in hardware model. There are mainbox, card reader and alphabet cards. We also make the rotated LCD monitor. The main box and card reader are connected with parallel cable. The alphabet card should insert to card slot

Front side: It contains command button, speaker and monitor.

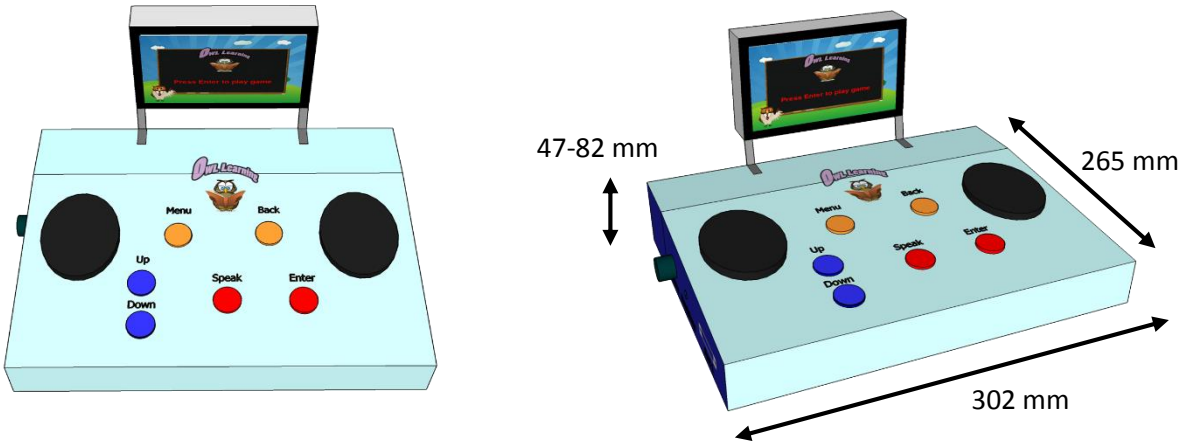

Figure 4.1 Model design

Back side

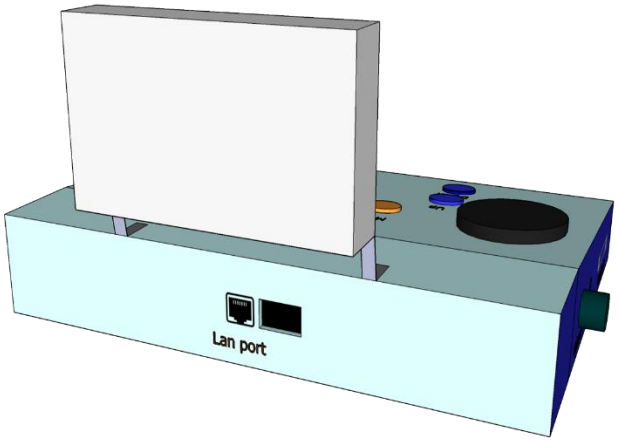

Figure 4.2 Model design (Back side)

Left side

Figure 4.3 Model design (Left side)

Right side

Figure 4.4 Model design (Right side)

Reader front side

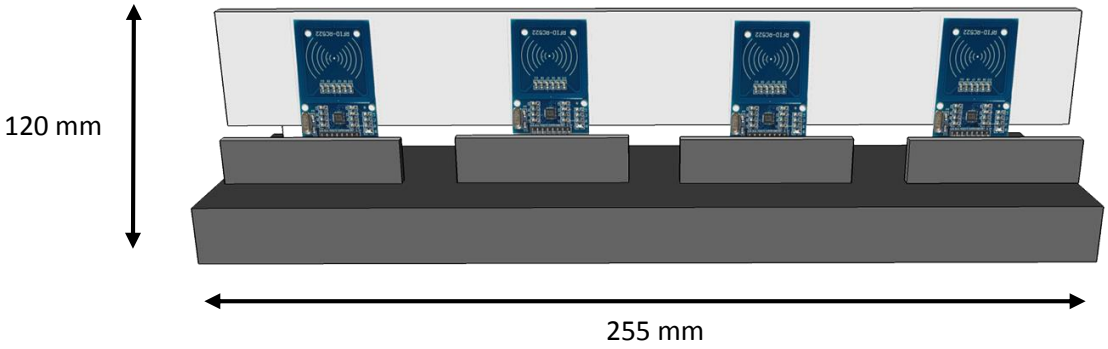

Figure 4.5 Reader Design

Reader back side

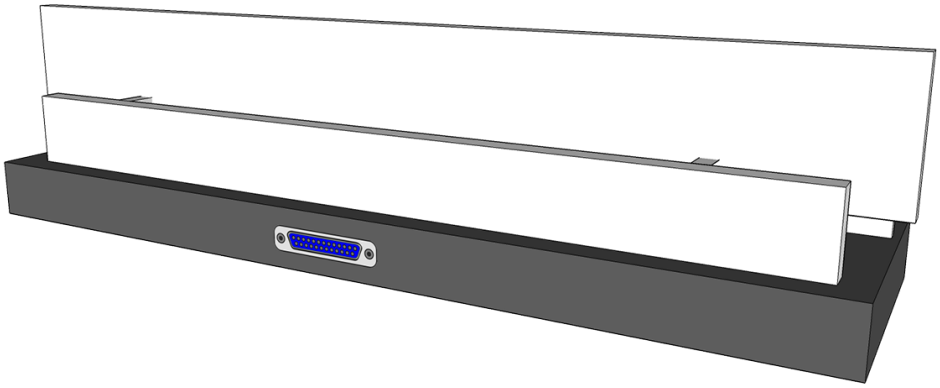

Figure 4.6 Reader Design (Back side)

Alphabet card

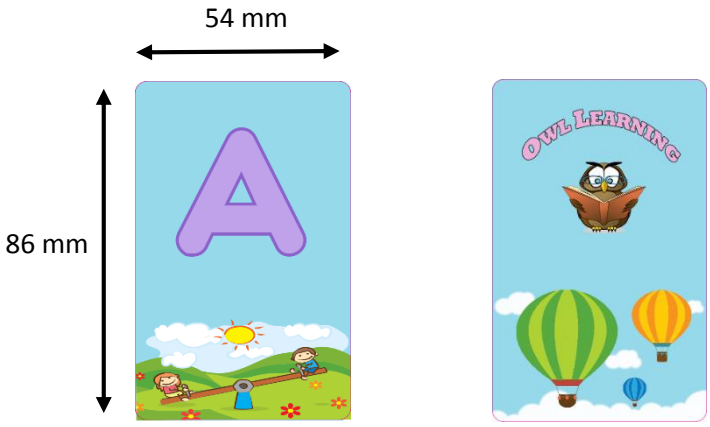

Figure 4.7 Alphabet card

4.2 Screen shots of running software

We have develop a prototype of the talking card system for this semester. This prototype can use only simply talking card program.

Start screen page

Figure 4.8 Start screen

MAIN MENU screen

This is the first page menu that showing feature of talking card. It contains 3 titles as following:

1 Simply talking card

2 Lost alphabet game

3 Worm picture game (worm word)

Figure 4.9 Main menu screen

Simply talking card

User can select any alphabet cards that should be a word such as DOG.

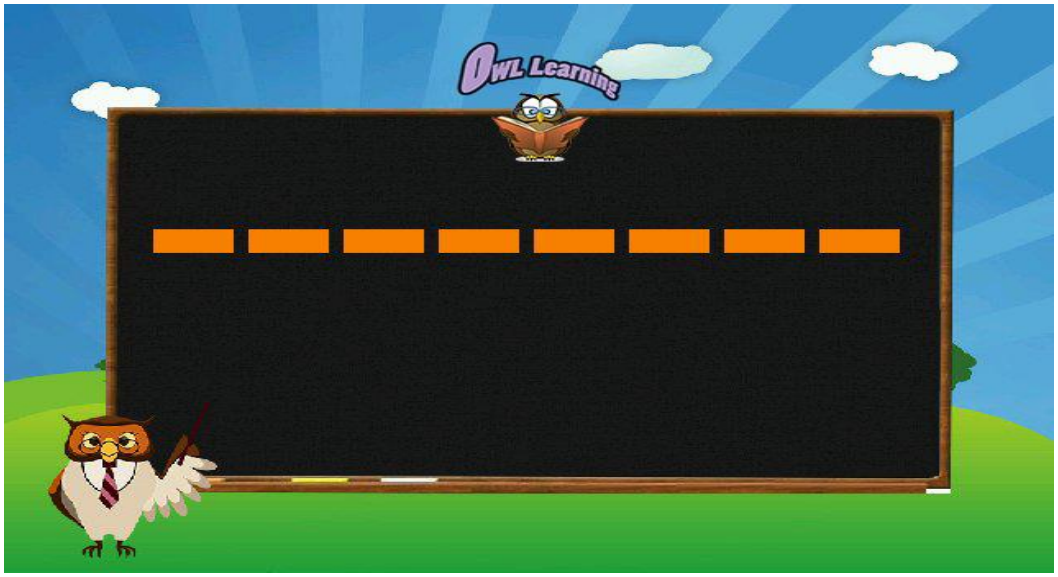

Figure 4.10 Simply talking card screen

The result of Simply talking card when user insert the card

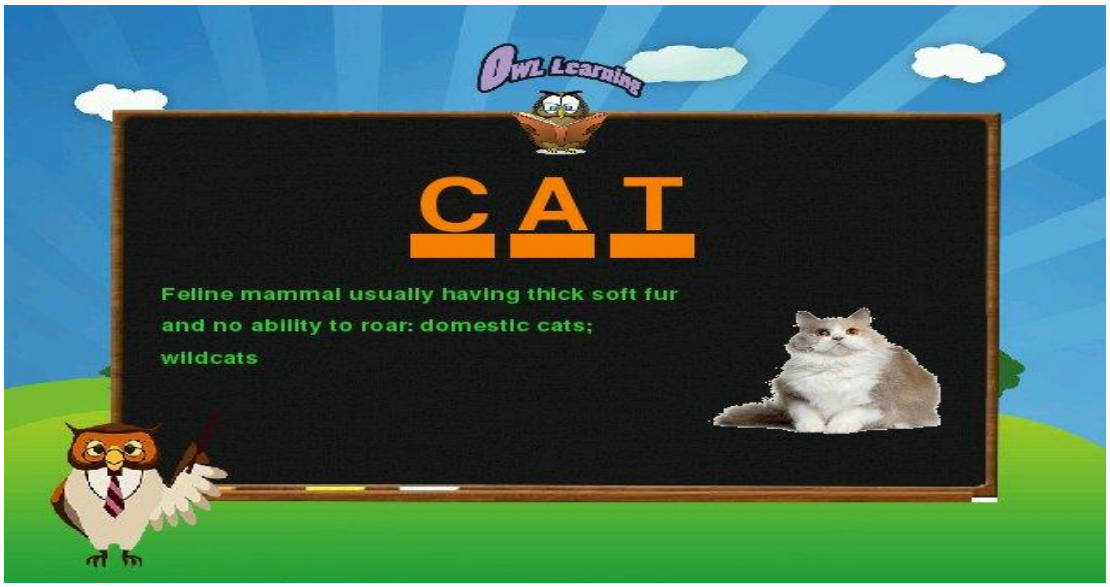

Figure 4.11 Simply talking card result

Screen will show message not let the blank space.

User should not input blank space

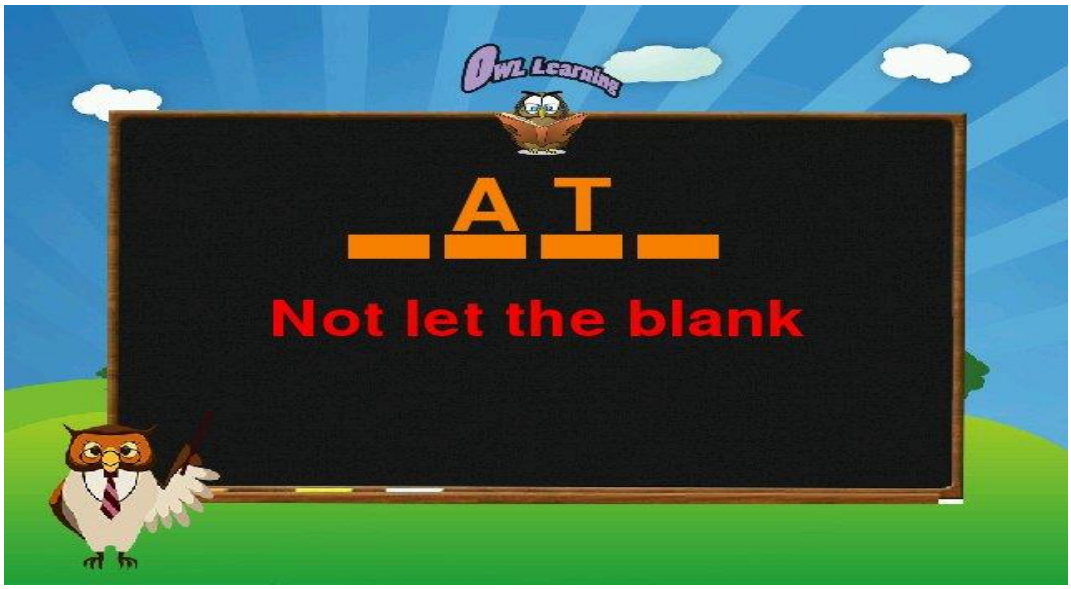

Figure 4.12 should not be blank space

Screen will show message Please insert some card

Figure 4.13 Card not found

Screen will show message if the word not found.

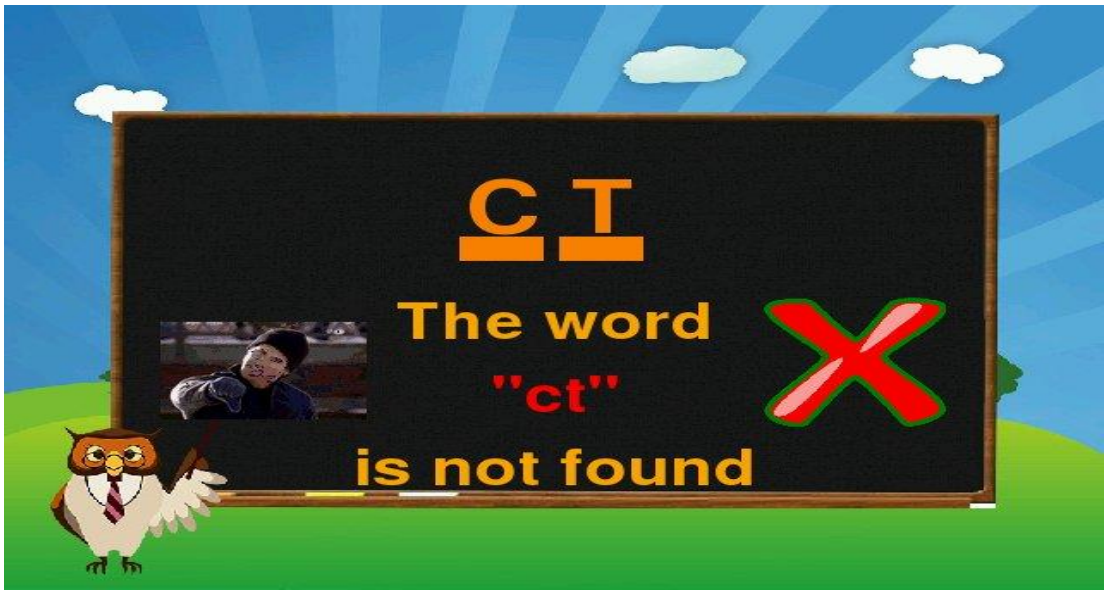

Figure 4.14 The word not found

Lost Alphabet

User should select alphabet cards that should be match a word.

Figure 4.15 Lost Alphabet screen

The result of Lost alphabet when user insert the cards correctly.

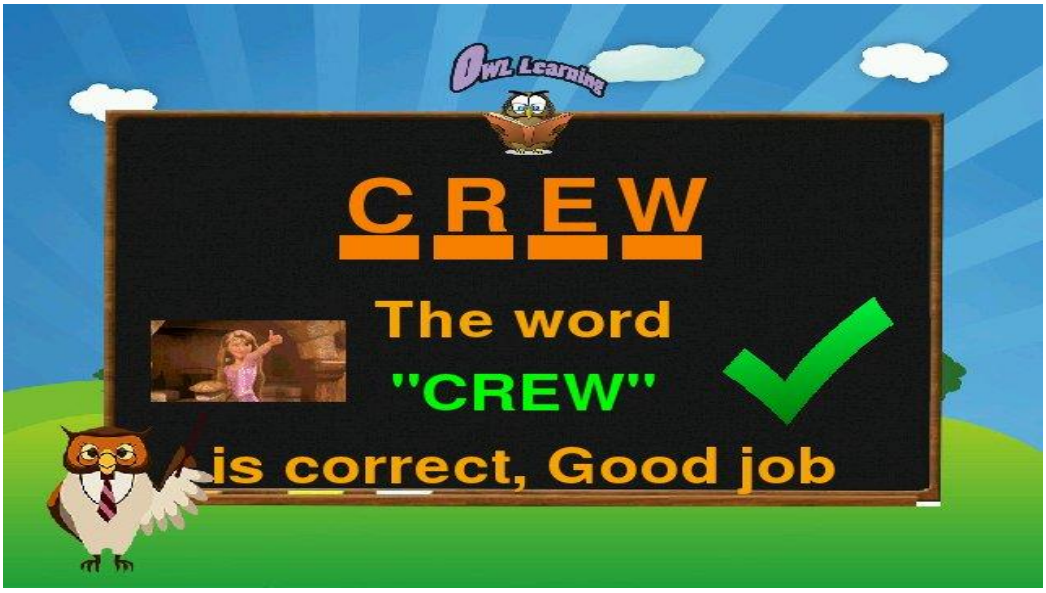

Figure 4.16 Match the word correct

The result Lost Alphabet when user insert the cards incorrect.

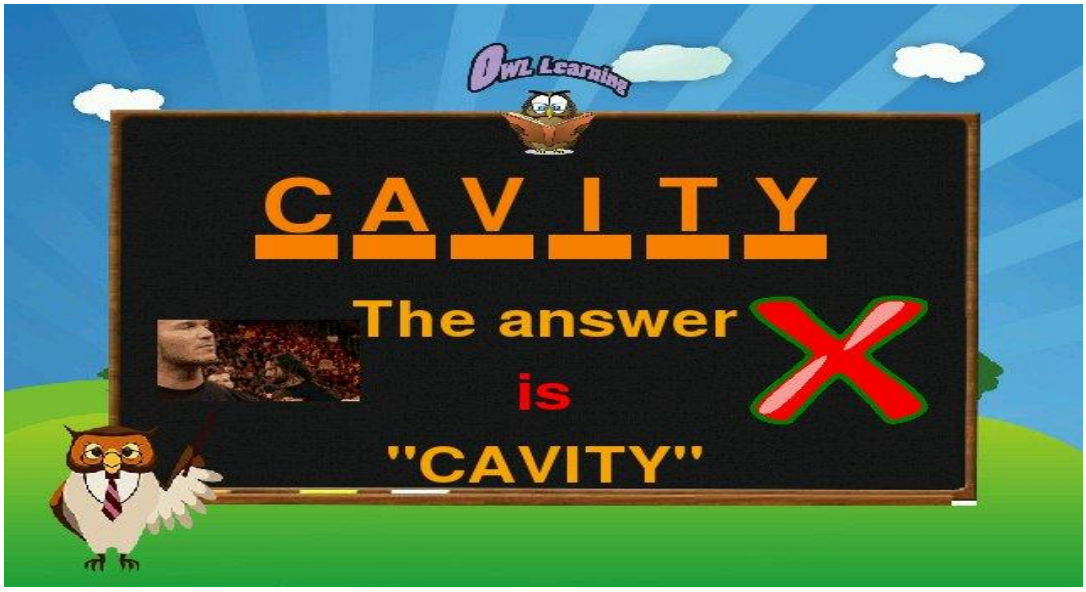

Figure 4.17 Match the word incorrect

The result Lost Alphabet when user insert the cards correct some positon but they should have more alphabet.

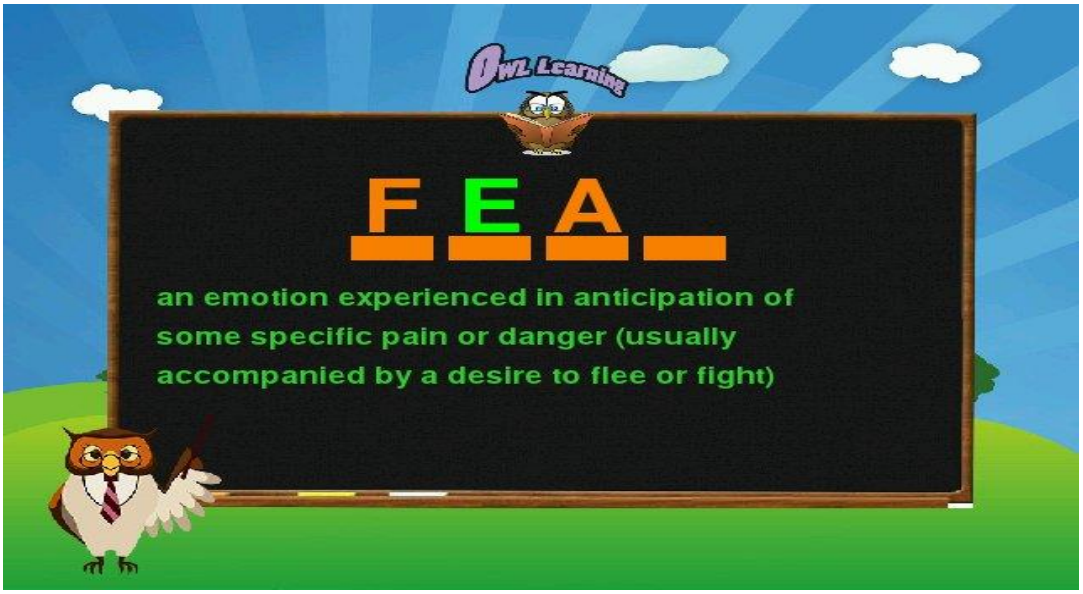

Figure 4.18 Match the word some correct

Word Worm

User should select alphabet cards that should be match a word with picture

Figure 4.19 Word worm screen

The result Word Worm when user insert the cards correctly.

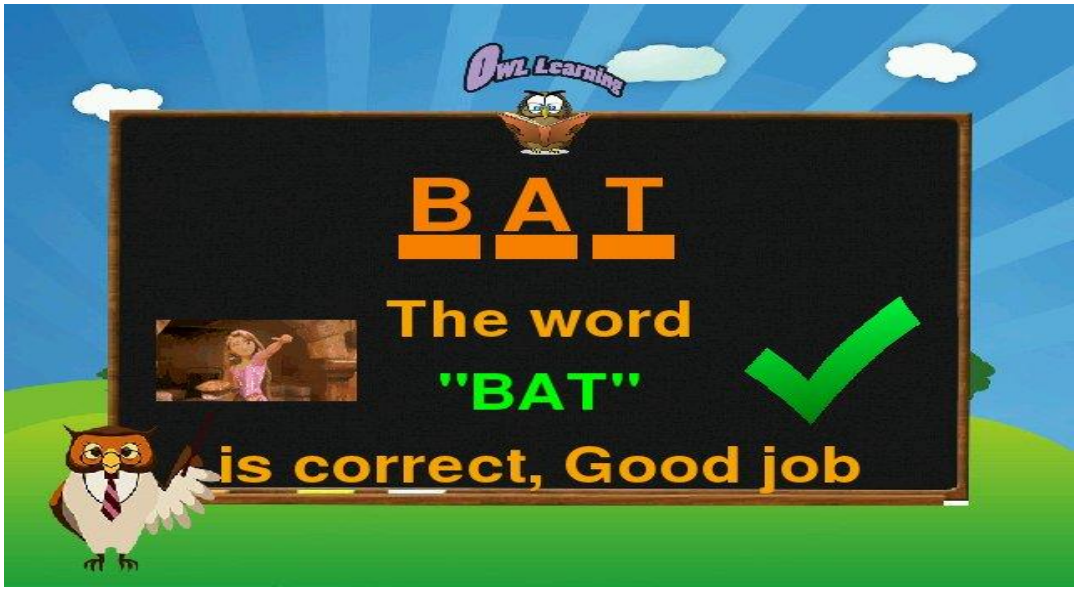

Figure 4.20 Match the word correct

The result Lost Alphabet when user insert the cards correct some positon but they should have more alphabet.

Figure 4.21 Match the word more word (Lost alphabet)

4.3 Screen shots of web application

Login screen

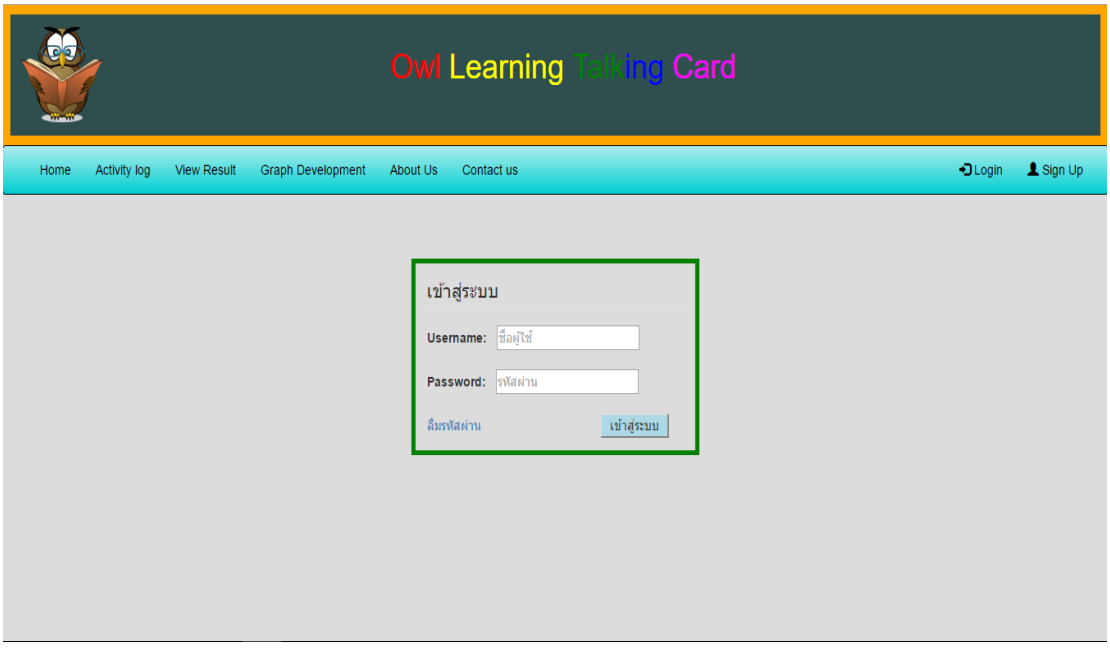

Figure 4.22 Login screen

Sign up screen

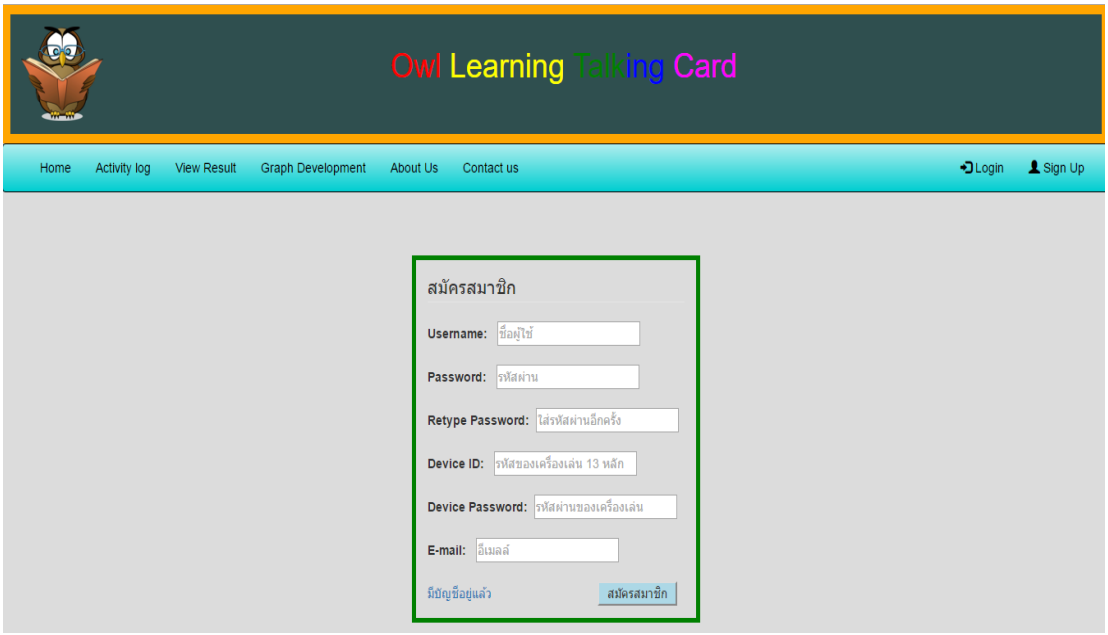

Figure 4.23 Sign up screen

Forget password screen

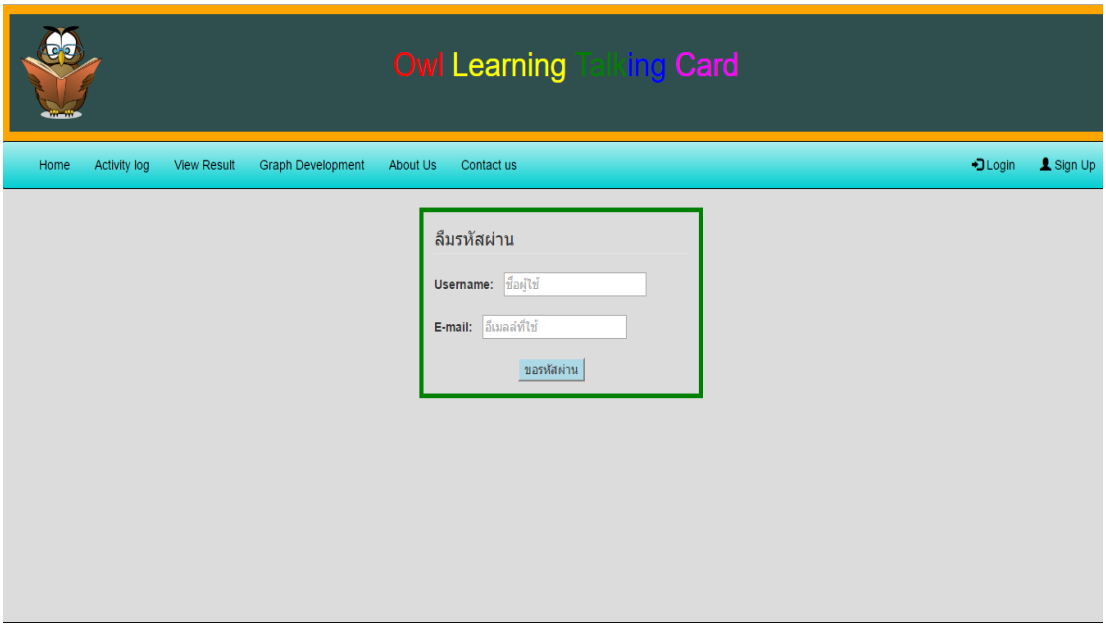

Figure 4.24 Forget password screen

Change password screen

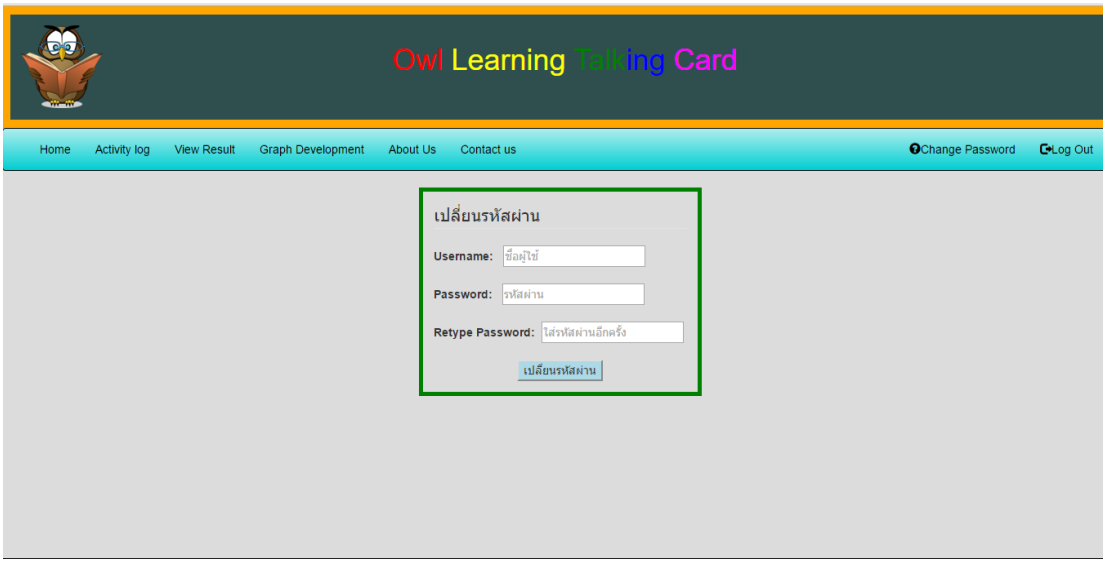

Figure 4.25 Change password screen

Home Screen

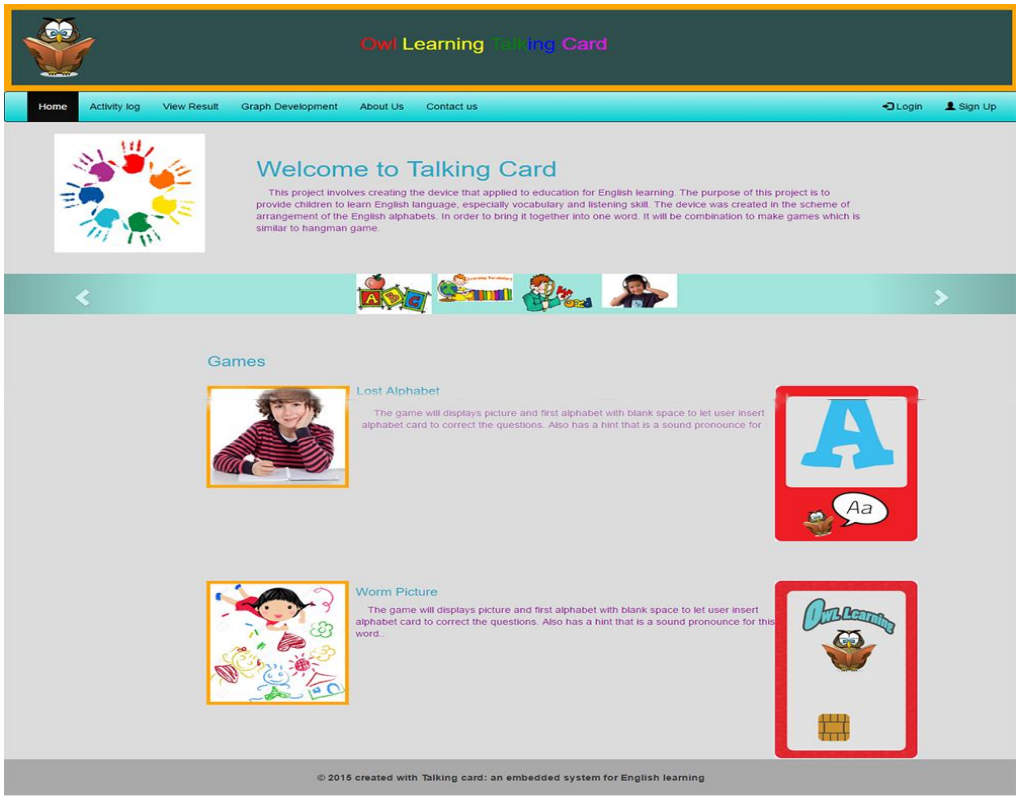

Figure 4.26 Home screen

Activity log screen

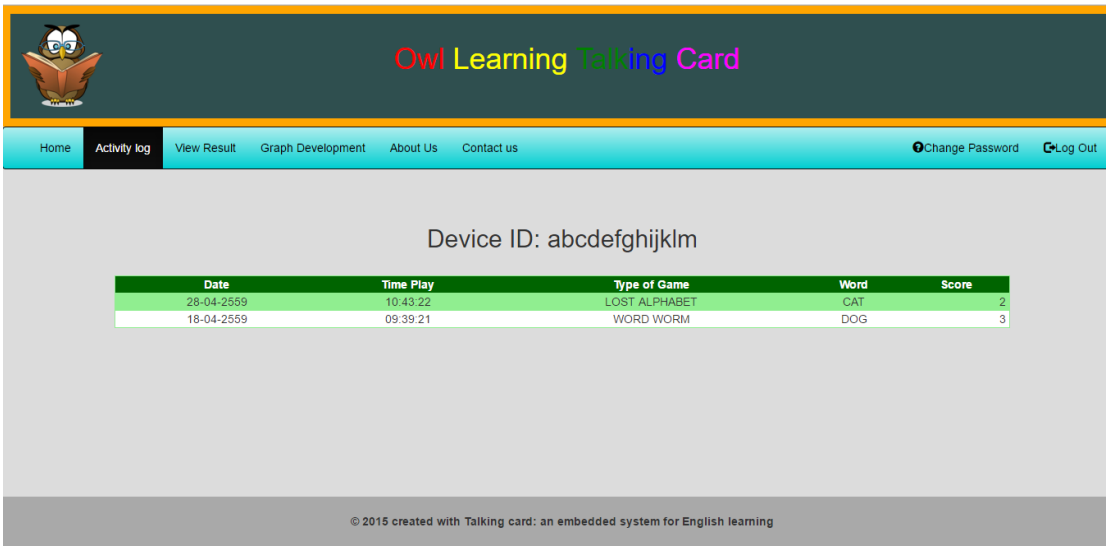

Figure 4.27 Activity log

View result screen

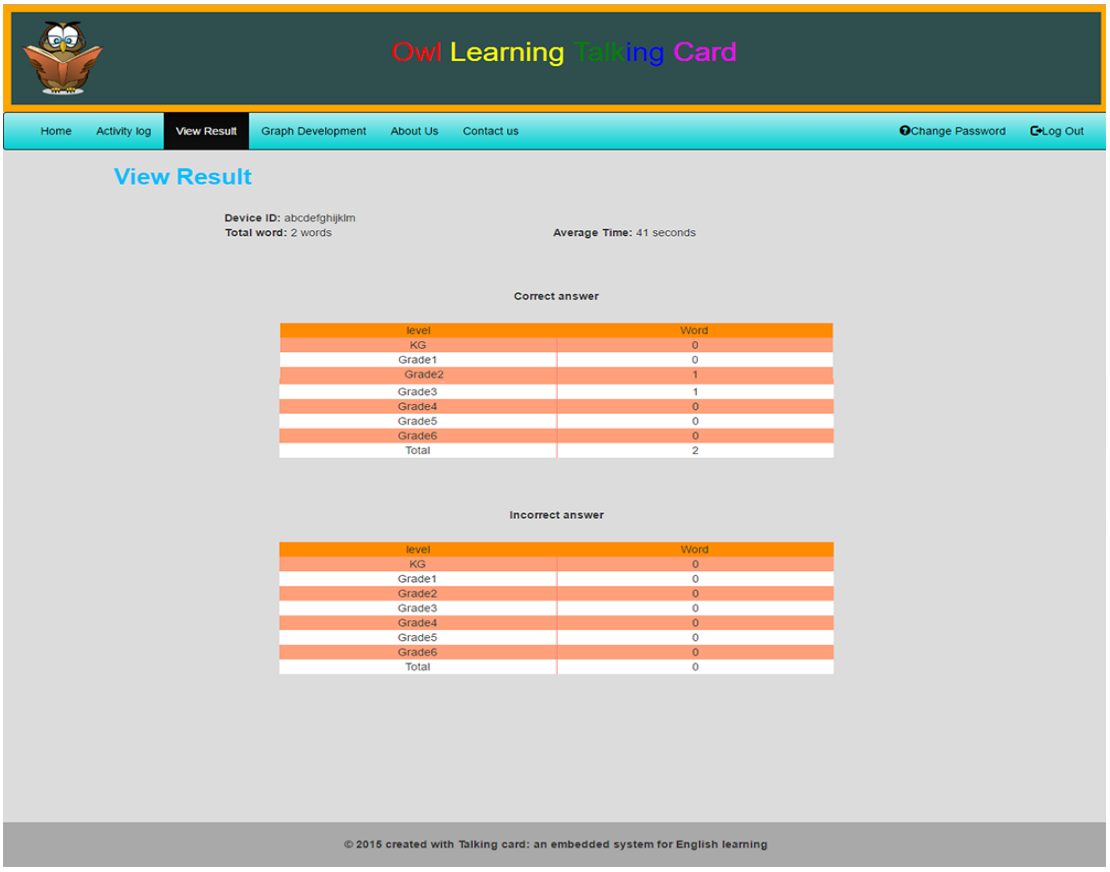

Figure 4.28 View result screen

Graph development screen

Figure 4.29 Graph development

About us screen

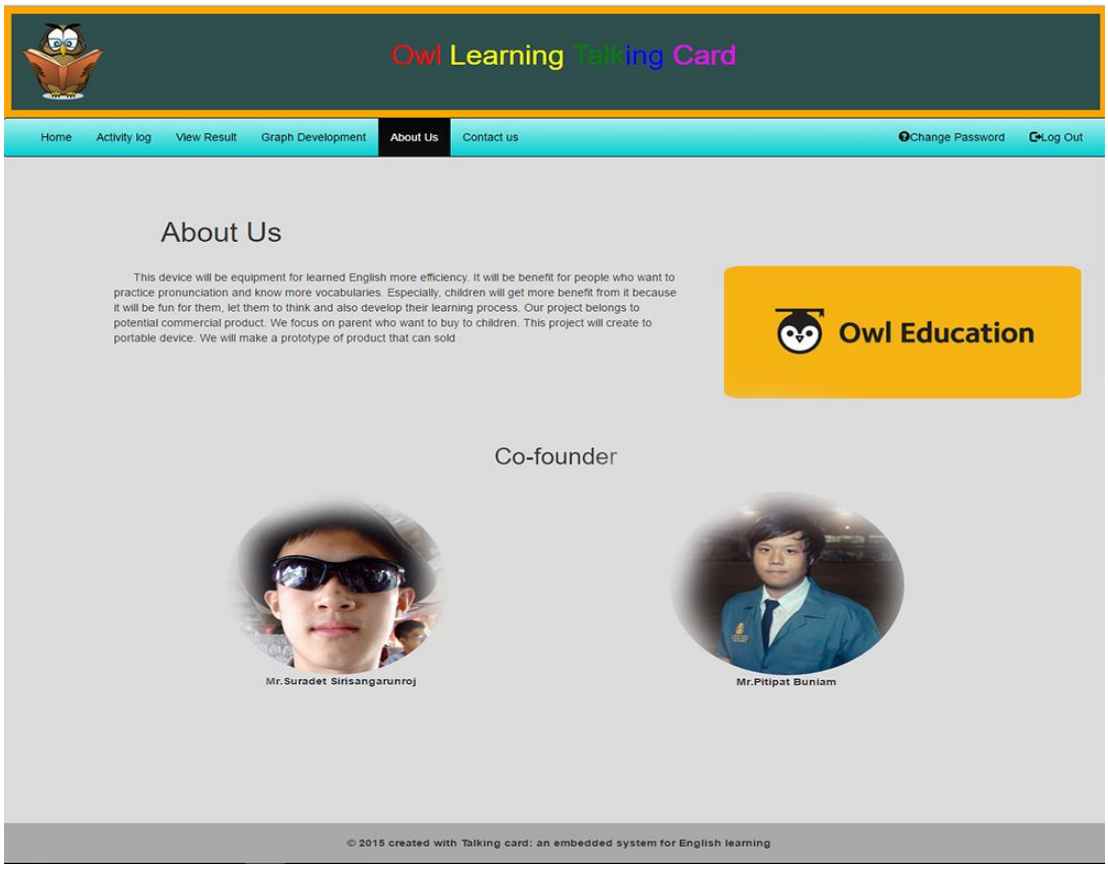

Figure 4.30 About us screen

Contact us screen

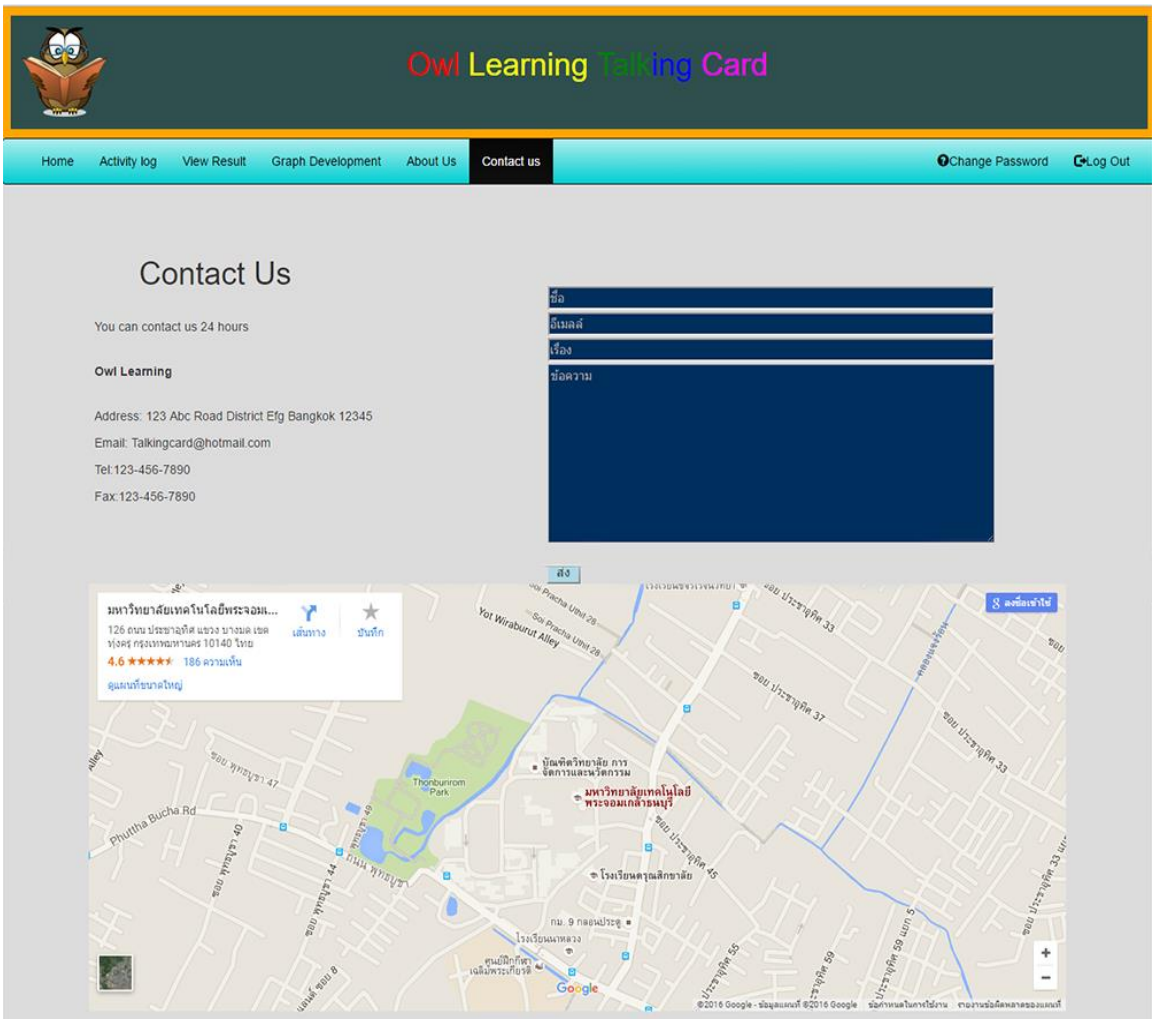

Figure 4.31 Contact us screen

4.4 Performance data for our project

Our device contain of 4000 English words. This prototype contains about 4000 words with the picture(Common words). Part of synthesize audio file, we create the audio file belong to dictionary words and also have spelling the word. Program&Games are complete and all games in Talking card system with GUI. Hard ware part, we connect 8 card readers and control with command button. LCD monitor 7 inch can be rotated. Our device include the battery Li-ion available about 1 hour and start from full battery. Alo have speaker 2 side left and right including headphone port and parallel port to connect between reader and mainbox. Web application part, we allow for all user(guest) and member. Member can login/sign up,change password and forget password. Also view result with graph and activity log.

4.5 Discussion

At this time our prototype can use in in all 3 games and already use 8 card slot. We are already testing the talking card system. Also move the electronics into the box and connect together. We in process of testing web application, testing system machine and Evaluation. After we finished all of working process. We will think about the future features development from our prototype to make it advanced.

Chapter 5

Conclusion

5.1 Summarize

Our project design to be an education device for the kids to let them learn English. We design to bring in anywhere so we insert a battery to our device. We also have LCD monitor and speaker that can be im prove English skill. Also we should have games to let user enjoyable. After we have design software and hardware parts, we go to buy all the component. Some parts have to wait for other country shipping so the scope are delayed but we can do the other part. Now, our project can be use as a prototype including all of the scope project and we would like to develop this prototype in the future.

5.2 Benefits to project developer

We have learned and practice programing skill with Python and other languages and known about many hardware device with many datasheets. We also get a knowledge about Speech Synthesis, Web application, Pygame and etc. Our group use the knowledge since 1st year to develop our project and we can apply the concept from related works and then this project will be applies for future work

5.3 Benefits to users

Children can use our device to practice English skill and enjoy with our games. Parents can also learn English languages for additional as well. Our device can make convenient to users.

5.4 Problems and Limitations

Smart card(Alphabet card) has invaluable for each card. Our device has more weight that children can not hold in one hand. Limit battery is about 1 hours, Charging for 6 hours and the monitor size is too small because of our budget Some tools are limited to use. So we should remove some features.

5.5 Future work

We think that we will add more features either software and hardware and also add more languages, not only English language. Our device can be able to use for cripple and minimize our prototype box for compact and easy to use. For the games and program we will make more GUI. We also plan to develop for mobile application.

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