Mutual: A Voice for the Voiceless Using Naïve Bayes Classifier Algorithm

A Thesis
Presented to
the Faculty of the College of Computer Studies
Lyceum of the Philippines University-Batangas

In Partial Fulfillment
of the Requirements for the Degree
Bachelor of Science in Computer Science
Specialized in Mobile Application Development

By:

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The application was developed thru the grace of God who gave the developers knowledge and wisdom to finish and establish the thesis titled: Mutual: A Voice for the Voiceless Mobile Application.

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Aubrey Bell
Ej Ehlvert
Paulynne Mae
Zyrill Anne

DEDICATION

We, the researchers, dedicate this project to our God Almighty our creator, our strong pillar, our source of inspiration, wisdom, knowledge and understanding. He has been the source of our strengths all throughout and on His wings only have we soared.

We also dedicate this study to our families and friends who have always showed us their constant encouragement and support.

Also, we dedicate this study to the people who showed interests in our projects and have always been there if we needed help especially our mentor Ma'am Maria Cristina M. Ramos.

Aubrey Bell
Ej Ehlvert
Paulynne Mae
Zyrill Anne

APPROVAL SHEET

In partial fulfillment of the requirements for the degree Bachelor of Science in Computer Science (Specialized in Mobile Application Development), this thesis titled **"Mutual: A Voice for the Voiceless Mobile Application Using Naive Bayes Classifier Algorithm"** has been prepared and submitted by Aubrey Bell T. Casimina, Paulynne Mae D. Caymo, Ej Ehlvert B. Datinguinoo, and Zyrill Anne U. De Villa and hereby recommended for oral defense.

Mrs. Maria Cristina M. Ramos, MSCS
Adviser

Defended in an oral examination before a duly constituted panel with a grade equivalent to _____

Mrs. Janice E. Velasquez, MSCS
Chairman

Miss Elaine Joy J. Ilao, MAITE
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Member

Mrs. Recalyn M. Manalo, MAELS
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Mutual: A Voice for the Voiceless using Naïve Bayes Classifier Algorithm

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ABSTRACT

In the perspective of everyday living, communication plays a very important role. For people, medium for communication like letters, telephone, computer and smart phones were being used to mobilize communication. On the other hand, for people with disability to hear (deaf people), sign languages were being deployed. However, how do deaf people communicate with other people when sign languages were not understood by many? Hence, in this study, a mobile application has been developed. **Mutual: A Voice for the Voiceless** is an online android mobile application that aims to help people to better understand and communicate with people who were not able to speak and/or hear. The application provides choices to either convert text to sign language or convert sign language to text. In converting text to sign language, an animated 3D avatar demonstrated the sign language translation of the inputted text. Added to that, Naïve Bayes Classifier Algorithm was implemented to search the application database for the equivalent sign language. An option was provided so that user can record one's gesture and the equivalent text will be displayed. This application benefited not only people with disability to hear but also people who wanted to learn sign languages. The application was designed to run on an android platform since at least 70% of the mobile users used Android Phones.

Keywords: *Mobile Application; Naïve Bayes Classifier Algorithm; Sign Language;*

1.0 INTRODUCTION

It is rare for a person to be born mute and calculating the exact odds of this occurrence happening is practically impossible. Based on the article entitled “What are the Odds of Being Born Mute” by Jess Kroll, an estimated one out of 1,000 school age children develop a condition called mutism. Aside from all physical possibilities of muteness, a toddler born completely or very nearly deaf in both ears has higher odds of also being unable to speak.

Cited from the Senate Bill No. 2117 by Senator Paolo Benigno "Bam" A. Aquino IV, in the Philippines, 1.23% of the entire population is deaf, mute, or hearing impaired. That means that at least 517,536 people currently have very limited access to media and information because of their hearing impairedness. Because of this, the use of sign language is very useful for better exchange of information.

Sign language is a kind of language that uses manual communication to convey meaning. This may include hand gestures, movements of the fingers or body, and facial expressions to convey the one’s ideas.

The researchers chose to develop this application to improve the communication gap between individuals who have hearing/speaking difficulties and hearing and speaking abled person.

The name MUTUAL came from the vision of the developers to provide mutual communication between the speaking and non-speaking people. The application provides variety of commonly used conversational English words/phrases to be translated to sign language as suggested by a Sign Language Translator.

Mutual: A Voice for the Voiceless offers the possibility of translation from text to video and vice versa using an animated 3D avatar to demonstrate the appropriate sign language. Additionally, the application will import recorded video from the file browser and once the video is imported it will be converted into text.

The user will click the icon from their android phones to start the application. The users have two options of what they want to choose, it’s either Text to Sign Language or Sign Language to Text.

The developers used java programming language embedded and built in Android Studio and XML file for design and development and used a hosting for the online database of the application.

The application use fifty-five words/phrases and sentences that the users may choose from.

The application requires a high-end Android version such as, like KitKat, Lollipop, Marshmallow, Nougat, Oreo, and Pie. Since the application runs online, the researchers would like to incorporate the application to Cordova, so it can be available and efficient for offline users.

1.1 Objectives of the Study:

1. Developed a mobile application that provide users an easy way to communicate and understand people with hearing impairment.
2. Developed a mobile application that used Java Programming Language as a platform and implementing Naïve Bayes Classifier Algorithm.
3. Utilized 3D avatar perspective to illustrate translation from sign language to text.

2.0 LITERATURE REVIEW

Mutual: A Voice for the Voiceless mobile application aims to reduce the gap in communication between non-speaking community and normal people.

This chapter focuses on gathering related information from different studies from local and foreign authors and researchers that may be helpful on the development of the application.

2.1 Sign Language

Sign language is a visual language for people who are not able to speak and/or hear. There are several sign languages available such as American, British, German, French, Italian, and Turkish Sign Language. American Sign Language (ASL) is well-known and the best studied sign language in the world. (Arsan and Ülgen, 2015)

2.2 Related Studies

As cited in the study titled "Voice to the Voiceless on Android Platform" by Nalbalwar et al., 2015, developing a system will improve dumb/ deaf person's lifestyle. Even it will be beneficial for the communication between the blind person and the dumb person. Overall System is effective and efficient because of the use of AVR microcontroller and android phone.

In the study of "Sign Language Converter" by Arsan et al., 2015, aims to improve the communication with the people who has hearing difficulties and using any sign language to express themselves. Google Voice Recognition is used for the voice to sign conversion.

In the study titled "Gesture Based HCI and Sign Language Recognition using Kinect Sensor" by Chaudhari et al., 2015, proposed a system that states communication will be done in bidirectional manner it means the normal user can speak in their response and dialogue can be converted into sign language, so persons who are unable to hear can also realize what he want to say.

In the study titled "Translating Indian Sign Language to text and voice messages using flex sensors" by Ashik et al., 2015, discusses the helps in improving the communication with the deaf and dumb using flex sensor technology. A brief description about various gestures and the implementation part is also discussed in this paper. Here, device recognizes Indian sign language alphabets, numbers and symbols based on sensor movement.

In the study titled "BTCOM: A Mobile Application on Sign Language Processing for Communication to Deaf-Mute and Hearing Impaired" by Vinluan et. al., 2015, discusses the use of sign language processing system applied to mobile phone as a mobile application. The sign language processing system will aid to convert voice recognition to sign language aiming to provide a bridge of communication to the Deaf Community.

In the study "Teaching in A Silent Classroom: A Case Study", by San Jose 2016, explored the reasons, the struggles, the successes, and insights gained in teaching mute and hard-of-hearing students. It revealed that mute and hard-of-hearing learners had difficulty in learning a language because they had no sense of the language.

2.3 Related Mobile-based Applications

ProDeaf Translator is an android based application that displays the sign language that the user is looking for. It

translates phrases and words to American Sign Language (ASL).

Mimix Sign Language Translator for Android, also an android application allows user to vocalize word/s and the application will display the sign language.

ASL Translator App is an application available for both Apple and Android Users. Users can type in what they want to say, and ASL Translator will provide series of videos and photos of the correct signs.

MotionSavvy is a tablet application can detect a person using ASL and converts it to voice. The application also has voice recognition which allows a person to record voice and converts it into text, so the hearing-impaired person can understand.

The ASL App is a mobile application that teaches the user conversational American Sign Language (ASL). The application is packed with more than 1500 signs and phrases, easy navigation and features, with different avatars that demonstrates the sign language.

Marlee Signs is another mobile application for learning to express oneself using ASL. This app will teach the user the fundamentals of ASL – from the signed alphabet and basic vocabulary through to common expressions in everyday life – using high-quality video demonstrations starring Marlee Matlin herself.

2.4 Difference of the Application from other Existing Applications

The applications mentioned in the previous section mostly share a common principle- to aid the communication gap between people who can hear and are able to speak and people who don't.

In the proposed application, the developers are aiming to develop an application that will benefit both ends: convert sign language to text for people who cannot communicate verbally and convert text to sign language for non-hearing persons that can understand sign language.

3.0 METHODS

Mutual: A Voice for the Voiceless is a mobile application intended for people who wanted to communicate with the non-hearing and speaking persons. By using the application, the user can enter a word/phrase that will then be translated to sign language. Also, the user can record a sign language gesture and the application will convert it to text.

Development of a successful application involves a thorough process. It is necessary for developers to follow a step-by-step process in order to get everything right. The mobile application development life cycle is just a representation of the conventional Software Development Life Cycle (SDLC) but from the perspective of a mobile device.

This phase is where the app life cycle begins. The Mobile Application Development Life Cycle consists of five phases:

- ✓ Pre-planning and Research
- ✓ Mental Prototyping and Analysis
- ✓ Design
- ✓ Implementation
- ✓ Maintenance

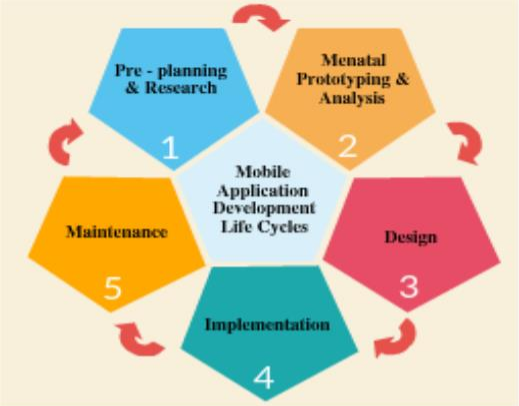

Figure 1: Mobile Application Development Life Cycle

A. PRE-PLANNING & RESEARCH

This first phase is the most important, the researchers had to plan over what concept to focus on. During this phase, it is important to do thorough research and brainstorming. The plan is not to simply come up with a simple application but an application that has an impact and will stand out in function.

B. MENTAL PROTOTYPING AND ANALYSIS

At this stage, the final approved topic was ready for further researches and careful study. Gathering related articles and studies is important to have additional knowledge about the topic. Finding a suitable algorithm is very critical in this stage as it is the heart of creating an application. The Mutual Application used Naïve Bayes Classifier Algorithm.

Naïve Bayes Classifier Algorithm

This algorithm is useful in classifying textual data, thus helping the developers to classify the entered text of the user and search the application's database for its equivalent sign language.

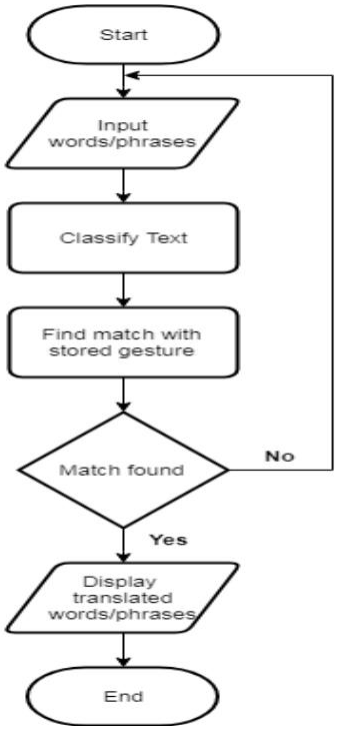

Figure 2: Naïve Bayes Classifier Algorithm

C. DESIGN

In this phase lies the designing of the program. Creating a pleasing, simple, clear, and easy to learn interface design that is intended for the target users. This phase is where the actual development of the application starts.

The requirements for creating the application are as follows:

Software: Adobe Photoshop, Unity, Android Studio
Hardware: PC/Laptops, Android Smartphone

D. IMPLEMENTATION

During this phase, the application requirement is complete and necessary software must be installed. The system is built and tested to ensure it performs as designed. This phase will be focusing on the generation of the codes using Android

Studio. Also, the actual user interface of the program with the aid of Adobe Photoshop.

E. TESTING AND MAINTENANCE

After the implementation phase, the testing of the application is done. This phase involves testing, debugging, fixing errors, and adding some changes that enhances the f u n c t i o n a l i t i e s o f t h e p r o g r a m . In developing an application, it is a good idea to test early and often. The researchers delivered the application to a Professional Sign Language Instructor for feedback evaluation and further enhancement. Making backups is part of the maintenance phase.

FLOWCHARTS

A flowchart is a type of diagram that represents an algorithm, workflow or process. In the application, the simplified process is shown in the flowchart.

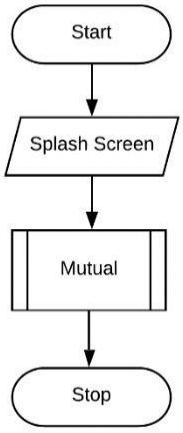

Figure 3: Mutual Application

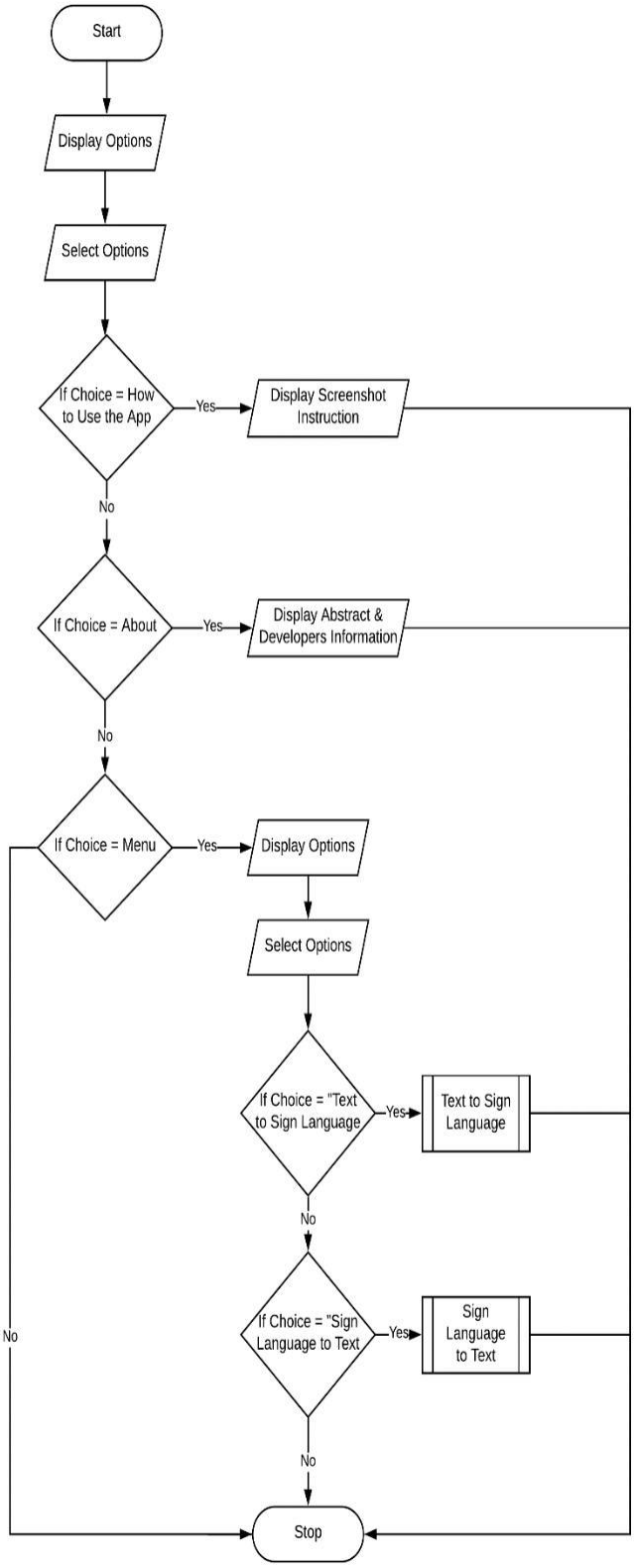

Figure 4: Home Screen

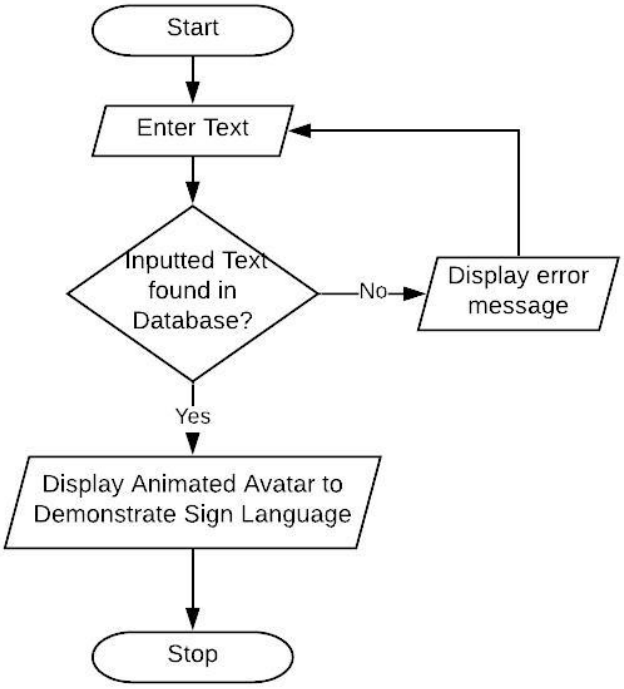

Figure 5: Text to Sign Language

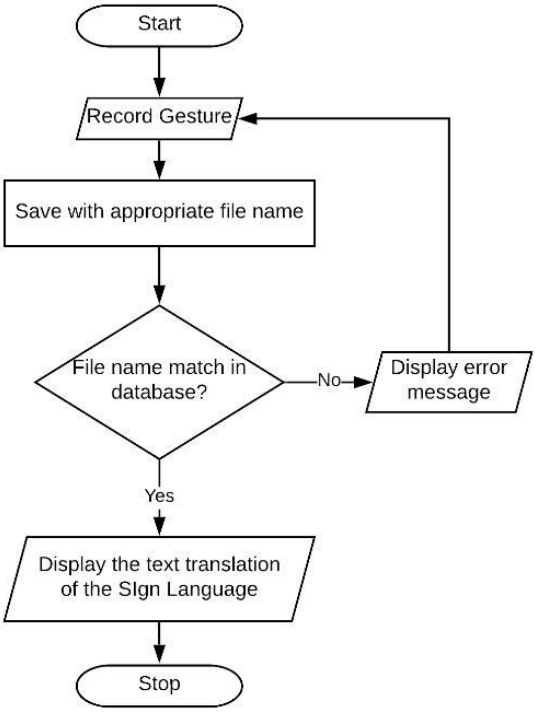

Figure 6: Sign Language to Text

4.0 RESULTS AND DISCUSSIONS

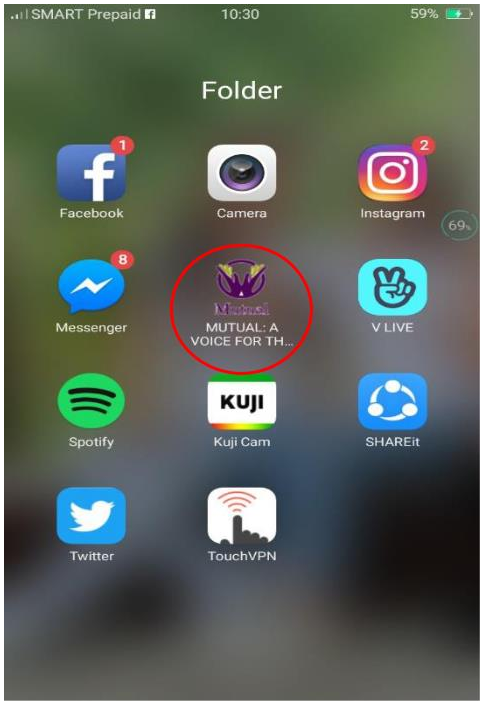

Figure 7. Mutual Application Logo

Mutual

Figure 8. Splash Screen

The splash screen will display the application logo for 3 seconds.

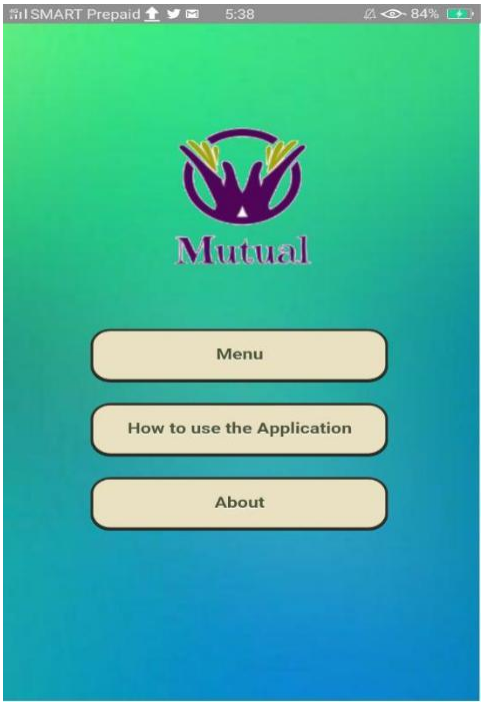

Figure 9. Home Screen

The Home Screen will display the menu for conversion, an instruction on how to use the application and about the developers.

Figure 10. Menu Screen

The Menu Screen provides the two choices of conversion:

Figure 11. How to use the Application Screen
Displays the step by step process on how to use the application

Figure 12. About Screen
Displays information about the developers

Figure 13. Text to Sign Language
The user will enter text in the textbox and a 3D avatar will demonstrate the sign language translation of the inputted text.

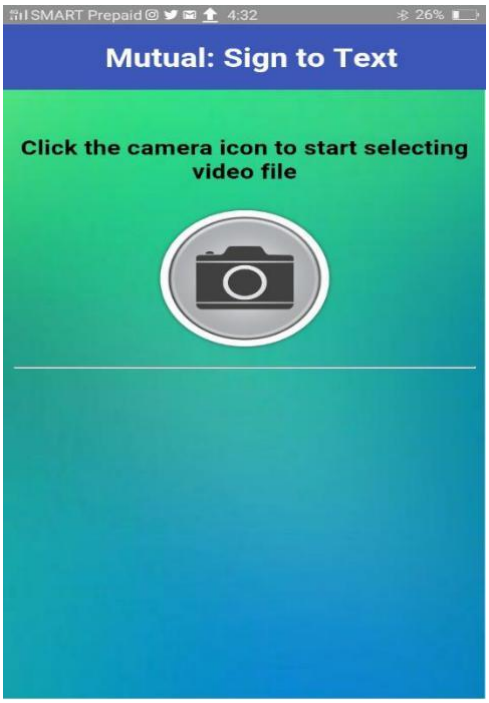

Figure 14. Sign Language to Text
The user can record one's gesture and the equivalent meaning will be displayed.

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY

Traditionally, sign language is usually utilized for people to understand them. However, this method might too difficult to learn especially when only a few may have known it. With this application, Mutual: A Voice for the Voiceless served as a tool to help people with hearing impairment to communicate. This application provides variety of commonly used conversational English words/phrases to be translated to sign language. It also offers the possibility of translating the text to video and vice versa using an animated 3D avatar to demonstrate the appropriate sign language. This application was embedded using Java programming, built in Android Studio, and used an online database. The application requires a high-end Android version such as KitKat, Lollipop, Marshmallow, Nougat, Oreo and Pie.

The use of Android Studio, an integrated development environment for development of Android OS, served as the platform in developing the application. Naïve Bayes Classifier is the algorithm used in the processes involved in the development of the application.

Mutual: A Voice for the Voiceless Mobile Application offers the process of translating text into sign language and converting recorded sign language into text. Using the Naïve Bayes classifier algorithm, the application can provide user the convenience of learning sign language translation of a word/phrase using an android smartphone.

Not only the application be beneficial to people who cannot speak and/or hear but also to those who can but want to learn different sign languages.

5.2 CONCLUSIONS

Sign languages have greatly shaped the communication specifically for those with impaired hearing. Moreover, the development of this application significantly provides insight in utilizing technology and helped people with impaired hearing to better understand them. Upon synthesizing the literature reviews, several factors have been realized:

1. The mobile application is created to provide the users an easy way to better communicate and understand people who are deaf and/or mute. MUTUAL: A voice for voiceless served as a medium for communication that helped people with impaired hearing to communicate. This application converts words/phrases to sign languages and vice versa.
2. The mobile application is created to provide the users an easy way to better communicate and understand people who are deaf and/or mute. Mutual: A Voice for the voiceless is developed not only for people who cannot speak and/or hear but also to those who were willing to learn sign languages.
3. For mutual communication, the application provided options to

either convert text to sign language for people who wants to communicate with deaf and/or mute person or convert sign language into text to record one's gesture and view its equivalent word/phrases. This application was made as a solution for sign language translation on mobile devices with the aid of internet access.

5.3 RECOMMENDATIONS

This study can be a reference to researchers who are into developing mobile application regarding sign language translation. The developers highly recommend that the mobile application can be improved in terms of the accuracy of the results especially in converting recorded sign language into text. It is also recommended to add more words/ phrases to be translated into sign language. Future developers can also add a female version of the avatar demonstrating gestures. Lastly, better improvement of the interface will be appreciated.

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APPENDICES

A. CODES

Home Screen Activity

```
<!doctype html>
<html>
<meta name="viewport" content="width=device-width, initial-scale=1.0">

<meta http-equiv="content-type" content="text/html; charset=UTF-8">
<style>
#top {
  position: fixed;
  top: 0;
  left: 0;
  z-index: 999;
  width: 100%;
  background-color:#3d57b8;
  height: 50px;
color:#FFF;
  padding:5px;
font-family:arial narrow;
}
h2 {
padding:5px;
margin-top:7px;
text-align:center;
}
html {
height:100%;
}
body {
background-image:url('img/background.png');
background-repeat:no-repeat;
background-attachment:fixed;
background-size: 100% 100%;
}
a {
text-decoration:none;
color:#000;
}
.myButton {
width:70%;
	-moz-box-shadow: 0px 1px 0px 0px #1c1b18;
	-webkit-box-shadow: 0px 1px 0px 0px #1c1b18;
	box-shadow: 0px 1px 0px 0px #1c1b18;
	background-color:#eae0c2;
	-moz-border-radius:15px;
	-webkit-border-radius:15px;
	border-radius:15px;
	border:2px solid #333029;
	display:inline-block;
	cursor:pointer;
	color:#505739;
	font-family:Arial;
	font-size:14px;
	font-weight:bold;
	padding:12px 16px;
	text-decoration:none;
	text-shadow:0px 1px 0px #ffffff;
	white-space: normal;
}
.myButton:hover {
	background-color:#ccc2a6;
}
.myButton:active {
	position:relative;
	top:1px;
}

</style>
<body>
<br><br>
<br><br>
<center>
<imgsrc="img/log1.png" width="50%">
<br>
<br>
<br>
```

```
<center>
<input type="button"
class="myButton" value="Menu"
onclick="window.location='menu.ph
p'" style="width:70%">
<br><br>
<input type="button"
class="myButton" value="How to
use the Application" id="btn-modal"
onclick="$('#myModal').modal('sho
w');" style="width:70%"> <br><br>


<input type="button"
class="myButton" value="About"
onclick="window.location='about.ph
p'" style="width:70%">
<br><br>
</body>
</html>
<script
   type="text/javascript"
src="https://code.jquery.com/jquery-
1.9.1.js"

></script>
<script
src="https://code.jquery.com/jquery-
1.8.2.min.js"></script>
<script src="jquery.mobile-
1.2.0.min.js"></script>

<script type="text/javascript"
src="https://netdna.bootstrapcdn.com
/twitter-
bootstrap/2.2.2/js/bootstrap.min.js">
</script>
<link rel="stylesheet" type="text/css"
href="https://netdna.bootstrapcdn.co
m/twitter-
bootstrap/2.2.2/css/bootstrap-
combined.min.css">

<script>
```

```
function enteredRange(x, y) {
var low = parseFloat(x);
var high = parseFloat(y);
var middle1 = parseInt((low + high) /
2);

middle.value = middle1;
document.getElementById('middle').
value = middle1;
}

$(document).ready(function () {
   $('#myModal').bind('show',
function () {

   });
   $('#btn-modal').click(function() {
   });
});

function closeDialog() {
   $('#myModal').modal('hide');
};

function okClicked() {
closeDialog();
};
```

```
</script>
<div id="myModal" class="modal
hide fade" tabindex="-1"
role="dialog"
aria-labelledby="myModalLabel"
aria-hidden="true" data-
keyboard="false" data-
backdrop="static" >
<div class="modal-header"> <button
type="button" class="close"
data-dismiss="modal" aria-
hidden="true">×</button>
<h3 id="myModalLabel">How to
use the application</h3>
```

```
</div>
<div class="modal-body" id="modal-
body" >
<imgsrc="img/aa.jpg">
        <br><br>
<imgsrc="img/bb.jpg">
        <br><br>
<imgsrc="img/cc.jpg">
        <br><br>
<imgsrc="img/dd.jpg">
        <br><br>
        <input          type="button"
value="OK"
onclick="closeDialog();"
class="myButton"
style="width:70%">
</div>
</div>
```

Menu Activity

```
<!doctype html>
<html>
<meta name="viewport"
content="width=device-width,
initial-scale=1.0">
<style>
#top {
  position: fixed;
  top: 0;
  left: 0;
  z-index: 999;
  width: 100%;
  background-color:#3d57b8;
  height: 50px;
color:#FFF;
  padding:5px;
font-family:arial narrow;
}
h2 {
padding:5px;
margin-top:7px;
text-align:center;
}
html {
height:100%;
}
body {
background-
image:url('img/background.png');
background-repeat:no-repeat;
background-attachment:fixed;
background-size: 100% 100%;
}
a {
text-decoration:none;
color:#000;
}

.myButton {
width:70%;
        -moz-box-shadow: 0px 1px
0px 0px #1c1b18;
        -webkit-box-shadow: 0px
1px 0px 0px #1c1b18;
        box-shadow: 0px 1px 0px
0px #1c1b18;
        background-color:#eae0c2;
        -moz-border-radius:15px;
        -webkit-border-radius:15px;
        border-radius:15px;
        border:2px solid #333029;
        display:inline-block;
        cursor:pointer;
        color:#505739;
        font-family:Arial;
        font-size:14px;
        font-weight:bold;
        padding:12px 16px;
        text-decoration:none;
        text-shadow:0px   1px   0px
#ffffff;
}
.myButton:hover { background-
        color:#ccc2a6;
}
.myButton:active {
        position:relative;
        top:1px;
}
```

```
</style>
<body>
<div id="top">
<h2>MUTUAL</h2>
</div>
<br><br>
<br><br>
<center>
<br>
<br>
<center>
<table width="100%">
        <tr>
                <td
valign="top"><center><imgsrc="im
g/aa.png"                width="50%"
onclick="window.location='texttosig
n.php'"><br>
                Text -  Sign Language
                </td>
        </tr>
        <tr>
        <td> </td>
        </tr>
        <tr>
                <td
valign="top"><center><imgsrc="im
g/bb.png"                width="50%"
onclick="window.location='signtote
xt.php'"><br>
                Sign Language - Text
                </td>
        </tr>
        <tr>
                <td></td>
                <td> </td>
                <td></td>
        </tr>

</table>

</body>
</html>
```

Text to Sign Activity

```
<!doctype html>
<html>
<meta                name="viewport"
content="width=device-width,
initial-scale=1.0">
<style>
#top {
  position: fixed;
  top: 0;
  left: 0;
  z-index: 999;
  width: 100%;
  background-color:#3d57b8;
  height: 50px;
color:#FFF;
  padding:5px;
font-family:arial narrow;
}
h2 {
padding:5px;
margin-top:7px;
text-align:center;
}
html {
height:100%;
}
body {
background-
image:url('img/background.png');
background-attachment:fixed;
background-repeat:no-repeat;
background-size: 100% 100%;
}
a {
text-decoration:none;
color:#000;
}
.email{
background:#ecf0f1;
  border: #ccc 1px solid;
  border-bottom: #ccc 2px solid;
  padding: 8px;
  width:80%;
color:#000;
  font-size:1em;
  border-radius:4px;
```

```
}
.myButton {
width:70%;
	-moz-box-shadow: 0px 1px 0px 0px #1c1b18;
	-webkit-box-shadow: 0px 1px 0px 0px #1c1b18;
	box-shadow: 0px 1px 0px 0px #1c1b18;
	background-color:#eae0c2;
	-moz-border-radius:15px;
	-webkit-border-radius:15px;
	border-radius:15px;
	border:2px solid #333029;
	display:inline-block;
	cursor:pointer;
	color:#505739;
	font-family:Arial;
	font-size:14px;
	font-weight:bold;
	padding:12px 16px;
	text-decoration:none;
	text-shadow:0px 1px 0px #ffffff;
}
.myButton:hover {
	background-color:#ccc2a6;
}
.myButton:active {
	position:relative;
	top:1px;
}


</style>

<link rel="stylesheet" href="jquery-ui.css">
<script src="jquery-1.12.4.js"></script>
<script src="jquery-ui.js"></script>
<script
   type="text/javascript"

src="http://ajax.googleapis.com/ajax/libs/jquery/1.7.2/jquery.min.js"
></script>
<script type="text/javascript" src="http://code.jquery.com/ui/1.8.18/jquery-ui.min.js"></script>
<script type="text/javascript">


   $(window).load(function(){
   // there are 55 words/phrases
varacList = [
    "Are you sure",
    "Congratulations",
    "Do you understand",
    "Good afternoon",
    "Good evening",
    "Good morning",
    "Good night",
    "Good",
    "Goodbye",
    "Goodluck",
    "Hello",
    "How are you",
    "How old are you",
    "I dont know",
    "I like it",
    "I think",
    "I understand that",
    "Im fine",
    "Im from",
    "Im not feeling well",
    "Im sorry",
    "Its been a while",
    "My name is",
    "Nice to meet you",
    "No thank you",
    "No",
    "Please",
    "See you later",
    "Take care",
    "Thank you",
    "What about you",
    "What is your name",
    "Yes",
        "What for",
    "What",
```

```
      "Where",
      "Who",
      "When",
      "Why",
      "Wow",
      "I don't care",
      "I'm shy",
      "Boring",
      "Mad",
      "Angry",
      "Like",
      "I don't like",
      "Far",
      "Tired",
      "Beauty",
      "Ugly",
      "I love you",
      "Pray",
      "House",
      "School",
      "You are welcome"
];
$('#tags').autocomplete({
  source: function( request, response )
{
var matches = $.map( acList, function(acItem) {
     if (
acItem.toUpperCase().indexOf(request.term.toUpperCase()) === 0 ) {
       return acItem;
      }
    });
   response(matches);
  }
});



   });

</script>


<script>
          function changevideo() {

var video = document.getElementById("video");
varvideofile = document.getElementById("tags").value;

 if(videofile == "Are you sure" || videofile == "Can you speak english" || videofile == "Congratulations" || videofile == "Do you understand" || videofile == "Good afternoon" || videofile == "Good evening" || videofile == "Good morning" || videofile == "Good night" || videofile == "Good" || videofile == "Goodbye" || videofile == "Goodluck" || videofile == "Hello" || videofile == "How are you" || videofile == "How old are you" || videofile == "I dont know" || videofile == "I like it" || videofile == "I think" || videofile == "I understand that" || videofile == "Im fine" || videofile == "Imom" || videofile == "Im not feeling well" || videofile == "Im sorry" || videofile == "Its all right" || videofile == "Its been a while" || videofile == "My name is" || videofile == "Nice to meet you" || videofile == "No thank you" || videofile == "No" || videofile == "Please" || videofile == "See you later" || videofile == "Take care" || videofile == "Thank you" || videofile == "What about you" || videofile == "What is your name" || videofile == "Yes" || videofile == "You are welcome" || videofile == "What for" || videofile == "What" || videofile == "Where" || videofile == "Who" || videofile == "When" || videofile == "Why" || videofile == "Wow" || videofile == "I don't care" || videofile == "I'm shy" || videofile == "Boring" || videofile == "Angry" || videofile == "Like" || videofile == "I don't like" || videofile == "Far" || videofile ==
```

```
"Tired" || videofile == "Beauty" || videofile == "Ugly" || videofile == "I love you" || videofile == "Pray" || videofile == "House" || videofile == "School")
 {
video.src = "vids/"+videofile+".mp4";
document.getElementById('video').play();
 } else {
        alert("Item not found");
        document.getElementById("tags").value = "";

 }
}
</script>
<body>
<div id="top">
<h2>Mutual - Text to Sign</h2> </div>
<br><br>
<br><br>
<center>
<h3>Enter Text You Want To Convert As Sign Language</h3>
<input type="text" id="tags" class="email">

<br>
<br>
<input type="button" value="Translate" id="search" onclick="changevideo();" class="myButton">
<center>
<br>

<video id="video" autoplay="autoplay" style="border:1px solid #000;width:85%;background-color:#000" loop preload="metadata" >
<source id="srcWebm" >
</video><br>
<br>
</body>
</html>
```

Sign to Text Activity

```
<!doctype html>
<html>
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<style>
#top {
  position: fixed;
  top: 0;
  left: 0;
  z-index: 999;
  width: 100%;
  background-color:#3d57b8;
  height: 50px;
color:#FFF;
  padding:5px;
font-family:arial narrow;
}
h2 {
padding:5px;
margin-top:7px;
text-align:center;
}
html {
height:100%;
}
body {
background-image:url('img/background.png');
background-attachment:fixed;
background-repeat:no-repeat;
background-size: 100% 100%;
}
a {
text-decoration:none;
color:#000;
}
.email{
background:#ecf0f1;
  border: #ccc 1px solid;
```

```
        border-bottom: #ccc 2px solid;
        padding: 8px;
        width:80%;
        color:#000;
        font-size:1em;
        border-radius:4px;
        }
        .myButton {
        width:70%;
                -moz-box-shadow: 0px 1px 0px 0px #1c1b18;
                -webkit-box-shadow: 0px 1px 0px 0px #1c1b18;
                box-shadow: 0px 1px 0px 0px #1c1b18;
                background-color:#eae0c2;
                -moz-border-radius:15px;
                -webkit-border-radius:15px;
                border-radius:15px;
                border:2px solid #333029;
                display:inline-block;
                cursor:pointer;
                color:#505739;
                font-family:Arial;
                font-size:14px;
                font-weight:bold;
                padding:12px 16px;
                text-decoration:none;
                text-shadow:0px 1px 0px #ffffff;
        }
        .myButton:hover {
                background-color:#ccc2a6;
        }
        .myButton:active {
                position:relative;
                top:1px;
        }
        .image-upload > input
        {
                display: none;
        }

        .image-upload img
        {
                cursor: pointer;
        }
        </style>

        <link href="plugins/video-js/video-js.css" rel="stylesheet" type="text/css">
        <style type="text/css">
                video, input {
                display: block;
        }

        input {
                width: 100%;
        }

        .info {
                background-color: aqua;
        }

        .error {
                background-color: red;
                color: white;
        }

        </style>
        <!-- TODO: Missing CoffeeScript 2 -->

        <script type="text/javascript">


                window.onload=function(){

        (function localFileVideoPlayer() {
                'use strict'
        var URL = window.URL || window.webkitURL
        vardisplayMessage = function (message, isError) {
                var element = document.querySelector('#message')
                element.innerHTML = message
                element.className = isError ? 'error' : 'info'
                }
```

```
varplaySelectedFile = function (event) {
    var file = this.files[0]
    var type = file.type
    varvideoNode = document.querySelector('video')
    varcanPlay = videoNode.canPlayType(type)
    if (canPlay === '') canPlay = 'no'
    var message = 'Can play type "' + type + '": ' + canPlay
    varisError = canPlay === 'no'
    displayMessage(message, isError)
    if (isError) {

alert("Sorry this video is not supported.");
      return
    }

    varfileURL = URL.createObjectURL(file)
    videoNode.src = fileURL

  }
varinputNode = document.querySelector('input')
inputNode.addEventListener('change', playSelectedFile, false)
})()

varmyVideoPlayer = document.getElementById('video_player'),
    meta = document.getElementById('meta');



myVideoPlayer.addEventListener('loadedmetadata', function () {
    var duration = myVideoPlayer.duration;
```

```
        //s
    var val1 = prompt("Enter File Name");
if (val1 === null) {
   return false;
}
    // start play

      // end play
    var cap = document.getElementById("capture").files.item(0).name;
    // e

    // play vid

    varvidurl = document.getElementById("capture").value;
// end play vid




    varvideofile = cap.replace(/.mp4/g,").toLowerCase();
    varval = val1.toLowerCase();

     if(videofile == "are you sure" || videofile == "can you speak english" || videofile == "congratulations" || videofile == "do you understand" || videofile == "good afternoon" || videofile == "good evening" || videofile == "good morning" || videofile == "good night" || videofile == "good" || videofile == "goodbye" || videofile == "goodluck" || videofile == "hello" || videofile
== "how are you" || videofile == "how old are you" || videofile == "idont know" || videofile == "i like it" || videofile == "i think" || videofile == "i understand that" || videofile
==  "im fine" || videofile == "imom" || videofile == "im not feeling well" || videofile
== "im sorry" || videofile == "its all right" || videofile == "its been a while" || videofile == "my name is" || videofile == "nice to meet you" || videofile == "no thank you" || videofile
```

```
== "no" || videofile == "please" || videofile == "see you later" || videofile == "take care" || videofile == "thank you" || videofile == "what about you" || videofile == "what is your name" || videofile == "yes" || videofile == "you are welcome" || videofile == "what for"
|| videofile == "what" || videofile == "where" || videofile == "who" || videofile == "when" || videofile == "why" || videofile == "wow" || videofile == "i don't care" || videofile == "i'm shy" || videofile == "boring" || videofile == "mad" || videofile == "angry" || videofile == "like" || videofile == "i don't like" || videofile == "far" || videofile == "tired" || videofile == "beauty" || videofile == "ugly" || videofile == "i love you" || videofile == "pray" || videofile == "house" || videofile == "school")
          {

        document.getElementById('meta').value = videofile;



        setTimeout(function(){
        document.getElementById("uploading").style.display="none";
        document.getElementById("cont").style.display="none";
        document.getElementById("loader").style.display="block";
        }, 1000);
        setTimeout(function(){
        document.getElementById("again").style.display="block";
        document.getElementById("loader").style.display="none";
        document.getElementById("cont").style.display="block";
        }, 7000);
         }
          else if (val == "are you sure" || val == "can you speak english" || val == "congratulations" || val == "do you understand" || val == "good afternoon" || val == "good evening" || val == "good morning"
|| val == "good night" || val == "good" || val == "goodbye" || val == "goodluck" || val == "hello" || val == "how are you" || val == "how old are you" || val == "idont know" || val == "i like it" || val == "i think" || val == "i understand that" || val == "im fine" || val == "imom" || val == "im not feeling well" || val == "im sorry" || val == "its all right" || val == "its been a while" || val == "my name is" || val == "nice to meet you" || val == "no thank you" || val == "no" || val == "please" || val == "see you later" || val == "take care" || val == "thank you" || val == "what about you" || val == "what is your name" || val == "yes" || val == "you are welcome" || val == "what for" || val == "what" || val == "where" || val == "who" || val == "when" || val == "why" || val == "wow" || val == "i don't care" || val == "i'm shy" || val == "boring" || val == "mad" || val == "angry" || val == "like" || val == "i don't like" || val == "far" || val == "tired" || val == "beauty" || val == "ugly" || val == "i love you"
|| val == "pray" || val == "house" || val == "school")
          {

        document.getElementById('meta').value = val;



        setTimeout(function(){
        document.getElementById("uploading").style.display="none";
        document.getElementById("cont").style.display="none";
        document.getElementById("loader").style.display="block";
        }, 1000);
        setTimeout(function(){
        document.getElementById("again").style.display="block";
        document.getElementById("loader").style.display="none";
        document.getElementById("cont").style.display="block";
```

```
        }, 7000);
         }
        else {
                alert("Item not found");
        }
        });




                }


        </script>

        <script
                type="text/javascript"

        src="http://code.jquery.com/jquery-
1.9.1.js"

        ></script>

        <style type="text/css">
                audio {
                display: none;
        }
        </style>


        <body>
        <div id="top">
        <h2>Mutual: Sign to Text</h2>
        </div>
        <br><br>
        <br><br>
        <center>
        <form                   action="c.php"
method="POST"     enctype="multipart/form-
data" accept-charset="utf-8" >
        <h3>Click the camera icon to start
selecting video file</h3>
        <div              class="image-upload"
id="uploading">
                <label for="capture">

        <imgsrc="img/cam.png"
width="40%"/>
                </label>

        <div                    id="message"
style="display:none"></div>
        <input                accept="video/*"
id="capture"             capture="camcorder"
type="file" >
        <video          controls          autoplay
style="width:90%;display:none"
id="video_player"></video>
        </div>
        <center>
        <div                    id="loader"
style="display:none">
        <imgsrc="img/load.gif"
style="width:40%">
        </div>
        <div                     id="cont"
style="display:none">



        <h3>Text:</h3>
        <textarea       style="height:100px;"
class="email" id="meta">

        </textarea>
        </div>


        <hr>
        <input type="button"    value="Start
Again"  onclick="window.location='b.php'"
class="myButton"                id="again"
style="display:none">
        <br>
        <br>


        <script          src="plugins/video-
js/video.min.js"></script>
        <script          src="plugins/video-
js/Youtube.min.js"></script>

        </body>
        </html>
```

About Activity

```
<!doctype html>
<html>
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<style>
#top {
  position: fixed;
  top: 0;
  left: 0;
  z-index: 999;
  width: 100%;
  background-color:#3d57b8;
  height: 50px;
color:#FFF;
  padding:5px;
font-family:arial narrow;
}
h2 {
padding:5px;
margin-top:7px;
text-align:center;
}
html {
height:100%;
}
body {
background-image:url('img/background.png');
background-repeat:no-repeat;
background-attachment:fixed;
background-size: 100% 100%;
}
a {
text-decoration:none;
color:#000;
}
.email{
background:#ecf0f1; border:
  #ccc 1px solid; border-
  bottom: #ccc 2px solid;
  padding: 8px;
  width:80%;
color:#000;
  font-size:1em;
  border-radius:4px;
}
.myButton {
width:70%;
        -moz-box-shadow: 0px 1px 0px 0px #1c1b18;
        -webkit-box-shadow: 0px 1px 0px 0px #1c1b18;
        box-shadow: 0px 1px 0px 0px #1c1b18;
        background-color:#eae0c2;
        -moz-border-radius:15px;
        -webkit-border-radius:15px;
        border-radius:15px;
        border:2px solid #333029;
        display:inline-block;
        cursor:pointer;
        color:#505739;
        font-family:Arial;
        font-size:14px;
        font-weight:bold;
        padding:12px 16px;
        text-decoration:none;
        text-shadow:0px 1px 0px #ffffff;
}
.myButton:hover { background-color:#ccc2a6;
}
.myButton:active {
        position:relative;
        top:1px;
}



</style>

<body>
<div id="top">
<h2>About the Application</h2>
</div>
<br><br>
<br>
<p align="justify"><b>Mutual: A Voice for the Voiceless</b> is an android mobile
```

application that aims to help people to better understand and communicate with people who are not able to speak and/or hear. The application will provide choices to either convert a text to sign language or record a sign language and then convert it into text. In converting text to sign language, an animated 3D avatar will demonstrate the sign language translation of the inputted text. In the other option, the user can record one's gesture and the equivalent text will be displayed. Not only the application will be beneficial to people who cannot speak and/or hear but also to those who can but want to learn different sign languages.

```
</p>
<h2>Developers</h2>
<table width="100%">
	<tr>
		<td valign="top">
		<center>
		<imgsrc="img/3.jpg"
width="50%">
		<br>
		Casimina, Aubrey Bell T.
		<br>

	aubreybellcasimina@lpubatangas.ed
u.ph
		<br>
		+639482549824
		</td>
	</tr>
	<tr>
		<td> </td>

	</tr>
	<tr>
		<td valign="top">
		<center>
		<imgsrc="img/1.png"
width="50%">
		<br>
		Caymo, Paulynne Mae D.
		<br>

	paulynnemaecaymo@lpubatangas.ed
u.ph
		<br>
		+639491504757
	</td>
	</tr>
	<tr>
		<td> </td>
	</tr>
	<tr>
		<td valign="top">
		<center>
		<imgsrc="img/2.png"
width="50%">
		<br>
		De Villa, Zyrill Anne U.
		<br>

	zyrillannedevilla@lpubatangas.edu.p
h
		<br>
		+63930161197

	</td>
	</tr>
	<tr>
		<td> </td>
	</tr>
	<tr>
		<td valign="top">
		<center>
	<imgsrc="img/4.jpg" width="50%">
		<br>
Datinguinoo, EjEhlvert B.
<br>
ejdatinguinoo@lpubatangas.edu.ph
<br>
+639778313818


	</td>
	</tr>
	<tr>
		<td> </td>
	</tr>
```

```
</table>
<br>
<br>
<center>
<br>
<br>
</body>
</html>
```

Offline Activity

```
<html>
<head>
<meta name="viewport" content="width=device-width, initial-scale=1, user-scalable=no">
<title>GoNative</title>
<style type="text/css">
div.container {
    position: relative;
    top: 100px;
    text-align: center;
    }
</style>
</head>
<body>
<div class="container">
<p>No internet connection.<br>Connect and try again.</p>
</div>
</body>
</html>
```