iCurrency Converter: A MOBILE APPLICATION

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ABSTRACT

iCurrency Converter is an application developed using Android Studio and Java Programming Language designed to provide real-time updates about the currencies of countries that allows conversion of one currency into another in order to check its corresponding value.

This tool targets travelers, people with relatives abroad or OFW Workers, businessmen especially those who participate in online business and everyone who needs to use currency converter as its target. This is to help them become knowledgeable and familiarized regarding the rapid change in exchange rates and use this information to the best of their interest.

iCurrency converter can be used either online or offline and can be easily updated real-time and manually. It does not only aid in currency conversion but also provides information and can be easily shared through email, SMS, social networking sites, etc. To promote interaction between the developer and users, the users can give their feedback with regards to the application and this can give way to improvements that are suited for their needs. The application can also be muted and unmuted depending on the preference of the user.

Keywords

Currency Converter; Mobile Application

1.0 INTRODUCTION

Travel is not an escape, it is an entrance to reality to explore, dream and discover. Most travelers today take the opportunity to relax and wander without having a particular purpose or decision. But most of them encountered several problems while taking their break and utmost of those problem is the rapid changes in exchange rates. They are not

updated in the latest foreign countries currency that makes their desired relaxation a disappointment. They are experiencing difficulties in terms of their budget because of the unstable exchange rates. Being updated can help them manage their expenses and savings.

A currency converter is a calculator that converts the value or quantity of one currency into the relative values or quantities of other currencies. [1] It could be used to keep track of the exchange rates in an easier and systematic manner. To those who are going to travel, it is a wise think to check the different foreign exchange options they have beforehand.

Currency exchange rates affect travel, exports, imports and the economy. In line with this, the researchers proposed a mobile application that converts currency online and even have real time conversion for different currencies.

The uniqueness of this application compared with other currency converter is its feature which displays the image of top 30 countries' flags together with the image of the money and can add to favorites. The users can share the result of converted currency and also they can send the application by sharing the direct link.

However, it can only update every hour and has a maximum of 1000 request of data every month because of the researchers' free subscription. In order to avail the premium account, the researchers decided to gain profit through user's interest in purchasing the full version of the application.

1.1 OBJECTIVES OF THE STUDY
This study aims to:

1. Develop a mobile application for converting currency of different countries
2. Use an Android Studio and Java Programing Language in the development of iCurrency Converter
3. Provide an application that converts the value currency of one country to another.

2.0 LITERATURE REVIEW

The purpose of the related literature is to give the researchers an idea about the related topics on their project.

Exchange Rates

According to Imad A. Moosa, (2016) in his study entitled "Exchange Rate Forecasting: Techniques and Applications" exchange rates is an essential macroeconomics variable and can be excessive which badly affects the value of international trade and investments in the market. Fluctuations in exchange rates affects the international trade in many ways. Business managers and negotiators are forced to reduce the volume of international transactions; due to this, the response change the composition of investment to reduce certain risks. Some business managers encountered problems which require exchange rates forecasting since business firms operate in an uncertain world. [2]

According to Jeffry A. Frieden (2015) in his study "Currency Politics: The Political Economy of Exchange rate

Policy", government policy greatly influenced the exchange rate. Exchange rates is considered as the most significant value in any economy, for it affects all other values. As the exchange rates move, prices do not respond directly and completely to its fluctuation. Utmost of business representatives do not focus on the exchange rates but rather only as it involves the value they manage. [3]

Currency

An application helpful in currency recognition are now available on mobile phones. With the aid of computer vision methods which are able to run on affordable smartphones in recognizing currency bills that use the Bag of Words (BOW) based method for recognition. It also uses the Indian National Rupee as a working example. [4]

According to Michael K. Nicholls (2013), a new and well-developed system that will aid in dynamic currency conversion was founded to provide efficiency in banking. The said system comprehends a bank identifier system deciding whether currency conversion is accessible for a card-issuing bank of a given card such as by analogizing a bank identifier from the card with a list or table participating banks. The card owner is offered with a choice of selecting their preferred foreign currency transaction afterwards it is bounded that currency conversions is accessible for the card issuing-bank and that the exchange rate has not yet passed, such that the card holder does not have the need to sight such data and information except when foreign currency processing is available. [5]

According to John Anderson in his study Converting and Transferring Currency (September 2014), foreign exchange restriction is most consistent for foreign direct investigation (FDI) across economies to recognize common policies, and level the restrictiveness of economies foreign exchange regimes. [6]

Android Operating System

Android Operating System was developed for Android smartphones and tablets computers. This operating system was designed by the Open Handset Alliance which is led by Google.

In the studies made by Abraham Silberschatz, et.al, (2014), Android is like IOS in that it is layered bunch of software that provides a rich set of structure for developing mobile application. [7]

Android Studio

Clifton Craig mentioned that among other manufacturers of gaming systems, android is always the first choice since it is an open source and free. Android's integrated design allows for inclusive variety of configurations and customizations. Android is considered as a technology platform that consist of its own system of equipment to maintain it. "Nothing as powerful as Android is easy, but using Android Studio will make the task of developing Android apps easier." Android Studio has a stunning GUI which provides an excellent, full-featured and integrated GIT tool. Whatever is wanted to do in intelliJ, can be done in Android Studio. It simplifies the Android development process and makes it more accessible that is why Android Studio is revolutionary. [8]

Android has a feature that makes it enjoyable to developers such as open source and a definite level of community-driven development. Android applications are written in Java. Android beginners believe that Java Programming best practices are evenly relevant and applicable to Android programming. The researchers performed a case study to prove that the given idea was wrong. They used a well written Java application to Android. They illustrated specific examples of these anti-patterns or watch-outs together with their fixes. According to Yoonsik Cheon (2016), some of the best practices in writing Java programs are not best practices for Android. [9]

In the studies made by Mohd Shahdi Ahmad (2013), the researchers compared the android and iPhone Operating systems in terms of the security issue which concerns on the problems that are not encountered only by the mobile customers but the software developers also. In order to compare the two mobile operating systems, it comprised the different security requirements such as Application Sandboxing, Memory Randomization, Encryption, Data Storage Format and Built-in Antivirus. [10]

According to the data gathered by the Android Information Networking and Appliances (AINA) during the 28th International Conference on year 2014, it shows that modern smartphones that have recently debuted are one of the most notable breakthroughs in technology. Such smartphones have a rich spectrum of increasingly complex features, giving way to opportunities for software-led inventions.

In this paper, the researchers looked closely at three platforms distinguished as market leaders for the smartphone market by Gartner Group in 2013 and one platform, Firefox OS, portraying a new paradigm for operating system based on web technologies. They assimilated the platforms in several various classifications or categories. With the use of mobile version of the tic-tac-toe game in each of the four platforms, they pursued to inquire into the strengths, weakness and difficulties faced and developing mobile applications on these platforms. Huge distinctions are observed when examining community environments, hardware capabilities and platform maturity. These inevitably influences on the innovator's preferences when opting their decisions on mobile platform elaboration strategies. [11]

One of the studies made by Wei Lee in 2013 about Android Application Development Cookbook, stated that Mobile based Automatic Electricity Bin generation was used in expanding the development of the Android Studio which with their aim to Android Software. To get better explanation from the picture, they opted to use Optical Character Recognition and made use of Tesseract engine for it. The said application was accustomed to gain interpretation from the meter by means of capturing the image of meter. After the bill was generated, a mail will be sent to the customers. [12]

File Cacher

File Cacher is a simple library for Android which is used to cache an object to store in a file in the internal storage. It won't expose the cache to other apps to use because it is a context based cache

and the file creation mode is MODE_PRIVATE.

Java

Information about Java Money and Currency API by Anatole Tresch and Werner Keil claimed that the said application will reinforce currency arithmetic, even across a variety of currencies, and will support foreign currency exchange. Administering details surrounding serialization and thread security are to be though-out. JSR will also deliver money and currency API for Java, targeted at all users of currencies and financial amounts in java. [13]

The Definitive Java Programming Guide Fully updated for Java SE 8, Java: The Complete Reference recorded and reported by Herbert Schildt (2014) will explain how to develop, compile, debug, and run Java Programs. He covers the exclusive Java language involving its syntax, keywords, and basic programming codes, and in addition, the important portions of the Java API library. JavaBeans, servlets, applets, and Swing are scrutinized and real-life exemplification shows Java in action. New Java SE 8 attributions such as lambda expressions, the stream library, and the default interface method are discussed in detail. This Oracle Press resource also bears a reliable preface to Java FX. [14]

Real time-updates

A scheme and a system that recovers dynamic data when a notification with dynamic data is activated. The dynamic data relates to an account that is connected with a convenient consumer. The scheme and the system automatically send the notification to a notification device, where in the notification with the dynamic data is offered to the consumer. [15]

3.0 METHOD

For this mobile application, the researchers used an accurate converting and computing algorithm to convert a currency into another.

The researchers used Android Studio, an integrated development environment (IDE) for Android development, and JAVA, the official language for android development, because large parts on Android is written in Java and its API are designed to be called primarily from Java.

In order to make this application real-time, the researchers used the data (.json) from openexchangerates.org, this data provided all the currencies that the researchers needed ; it updates every time the user connects to internet and saves the data for offline use.
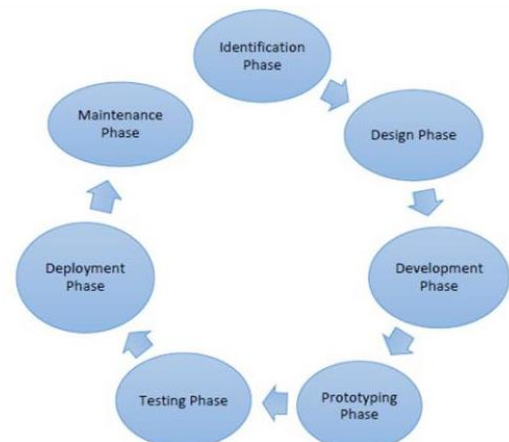

Figure 1. Mobile Application Development Life Cycle Model (MADLC)

Identification Phase

In this phase, the researchers thought of an application that can help in solving a specific problem and have a competitive advantage to other existing similar applications in the market. The researchers also planned the value of this application and the form on how the application works on an android phone.

Design Phase

In the making of the mobile application, the researchers used an android platform user experience design. Moreover, the software that was used was made in the android studio and the graphic design was edited using Adobe Photoshop. The researchers also spent more time in designing the UI of the application to get better results of the interface and paid attention to different screen ratios and sizes across devices. Lastly, while designing an application's User Interface or UI, the researchers considered different resolution.

Development Phase

In this phase, the application has been coded. The researchers started working on the application after the design phase. They developed a prototype that already have the functionality, assumptions, and helped them understand the scope of the work. Using the android studio, the researchers came up with the application even it has some bugs or problems. They thought that it is important to test the application early and often on actual devices. This is for the reason that even devices with the same hardware specs can vary widely in their behavior.

Prototyping Phase

In this phase, the functions of each prototype were analyzed by the team. The prototypes were tested and sent to some users or clients for their feedback and recommendation. Hence, the researchers were able to receive feedbacks from the users. Therefore, the required changes were implemented by returning at the development phase.

Testing Phase

After the app has been tested, the researchers had to deal not only with bugs but also with the usability and performance of the application. The researchers stabilized the app to get ready for another testing. Typically, as an application moved along the lifecycle, testing emulators can be different in real android phones.

Deployment Phase

In this phase, the application has been stabilized and is now ready for deployment. The researchers used an android platform because compared to other popular mobile platforms, androids take a very open approach to app distribution. Anyone is free to create an app store, and most android phones allow app to be installed from these third party stores. An example for this is the Google Play. After the deployment phase, the application can be updated based on the user's feedback on the market.

Maintenance Phase

The maintenance phase is the final phase even it involves a continuous process. Uploading it in app stores like Google Play provides more feedbacks for the developers. The feedback will be collected from users and the required changes will be made in the form of bug

fixes or improvements. Adding functionality in the application and improving the UI and UX would be under the maintenance phase.
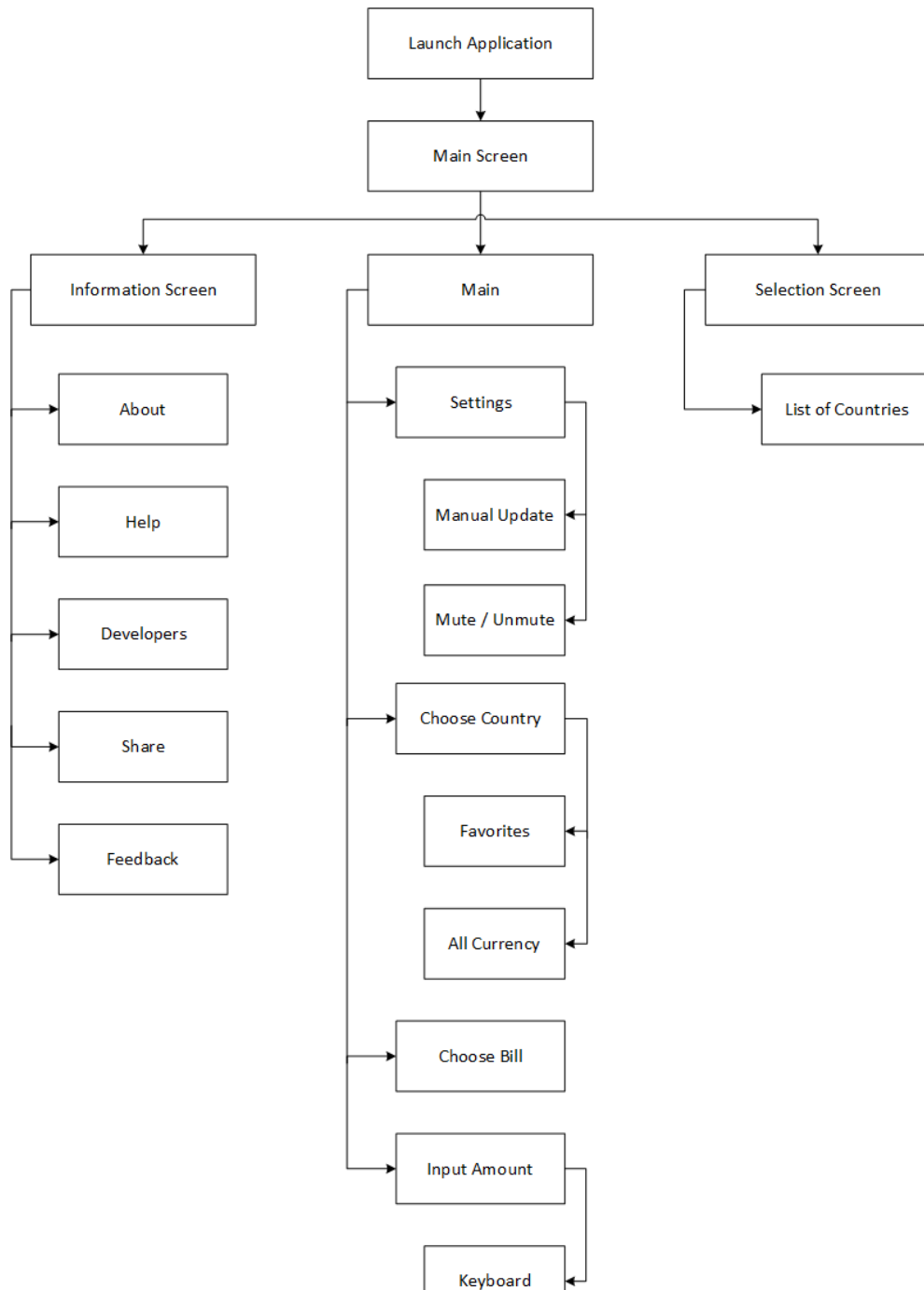
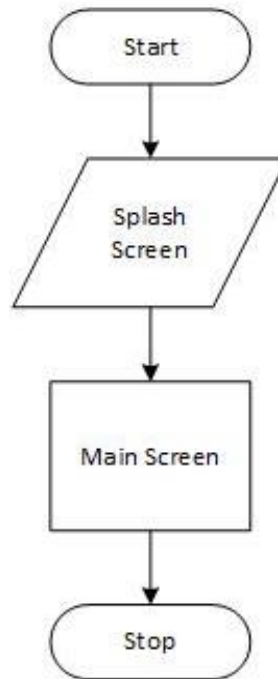## 4.0 DISCUSSIONS

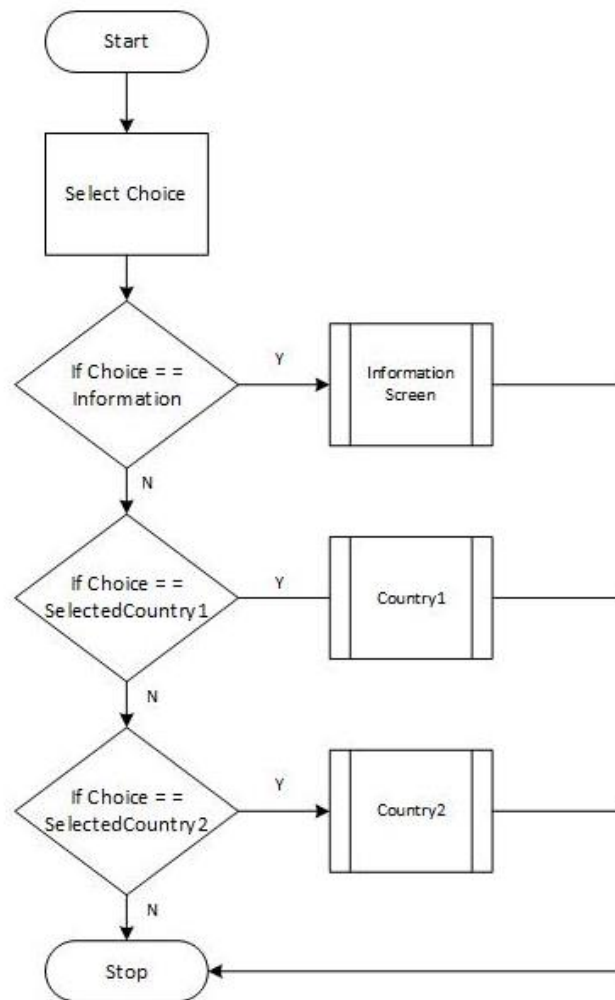**Figure 2. System Requirement Design**

FLOWCHART

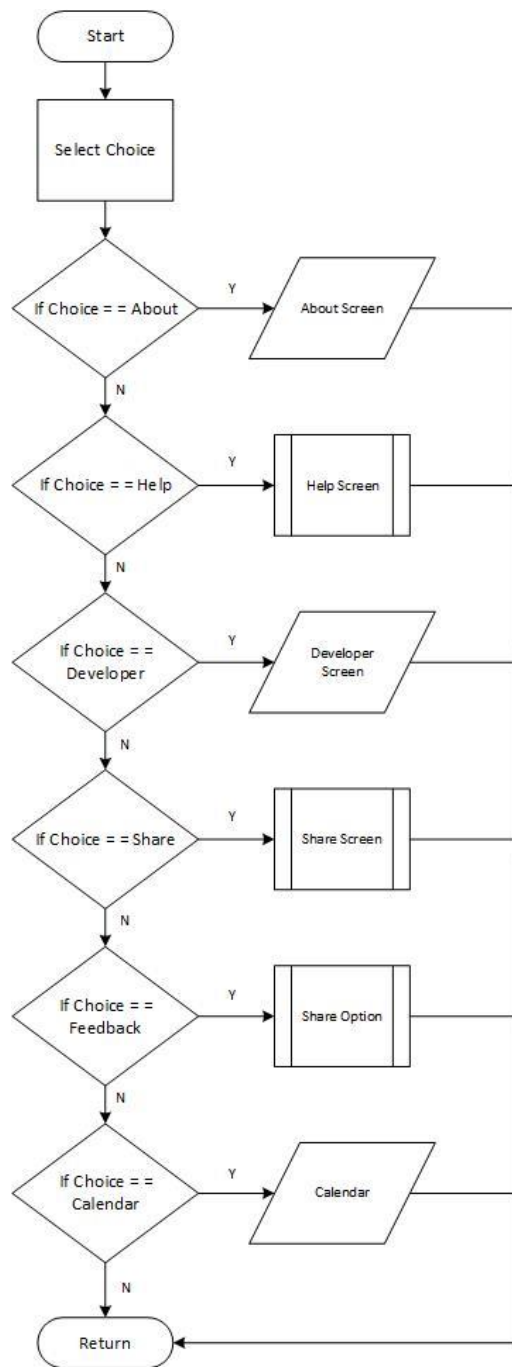**Figure 3.** Splash Screen
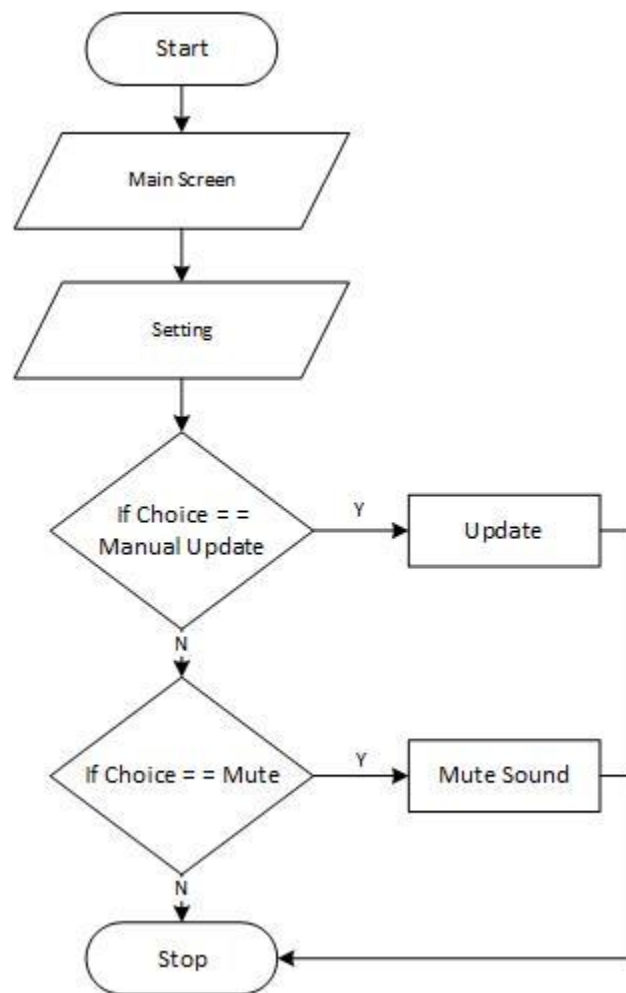
Figure 4. Main Screen
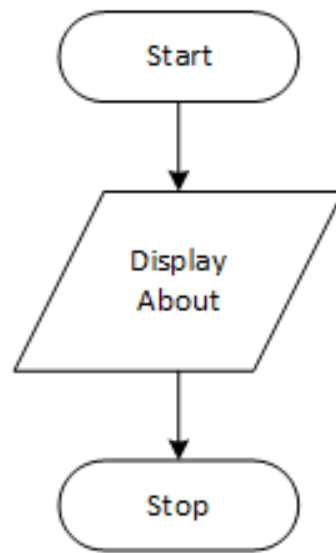
Figure 5. Information Screen
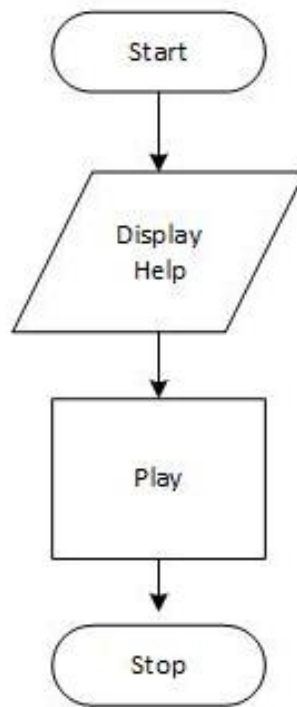
Figure 6. Setting Screen

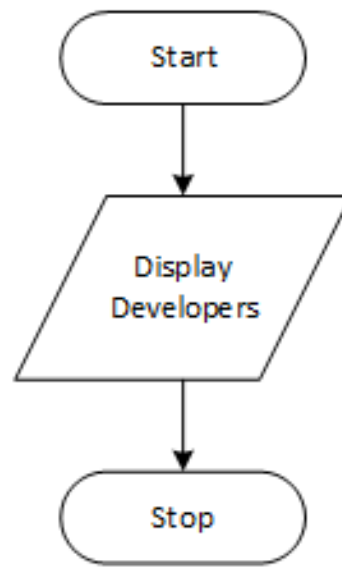**Figure 7.** About Screen

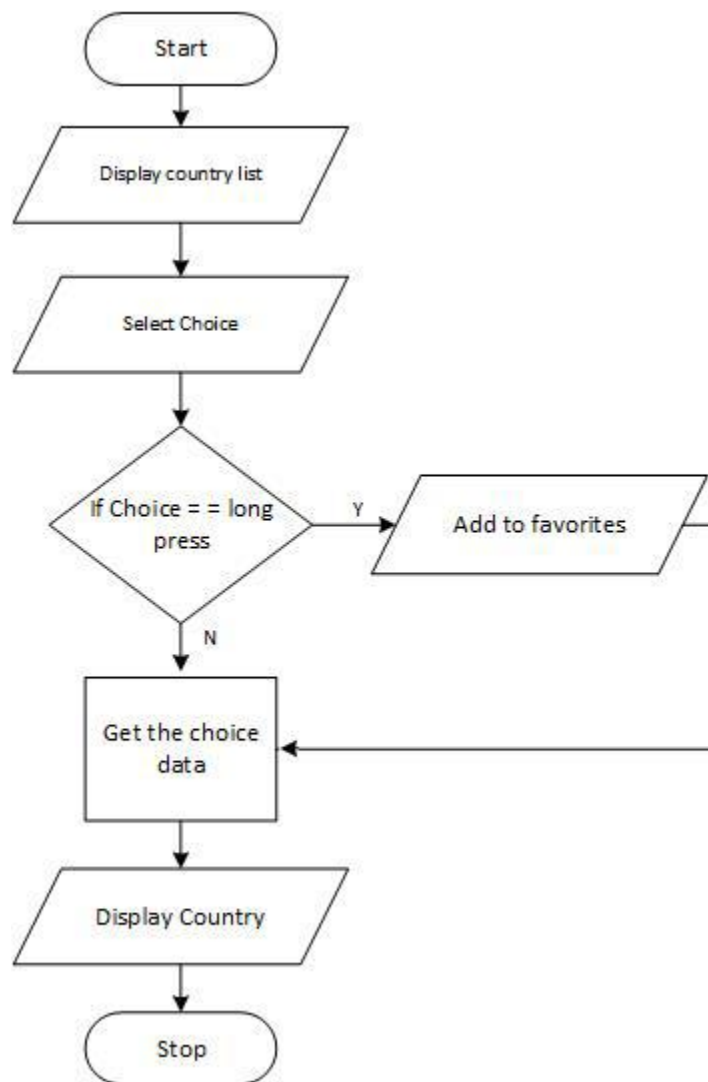**Figure 8.** Help Screen
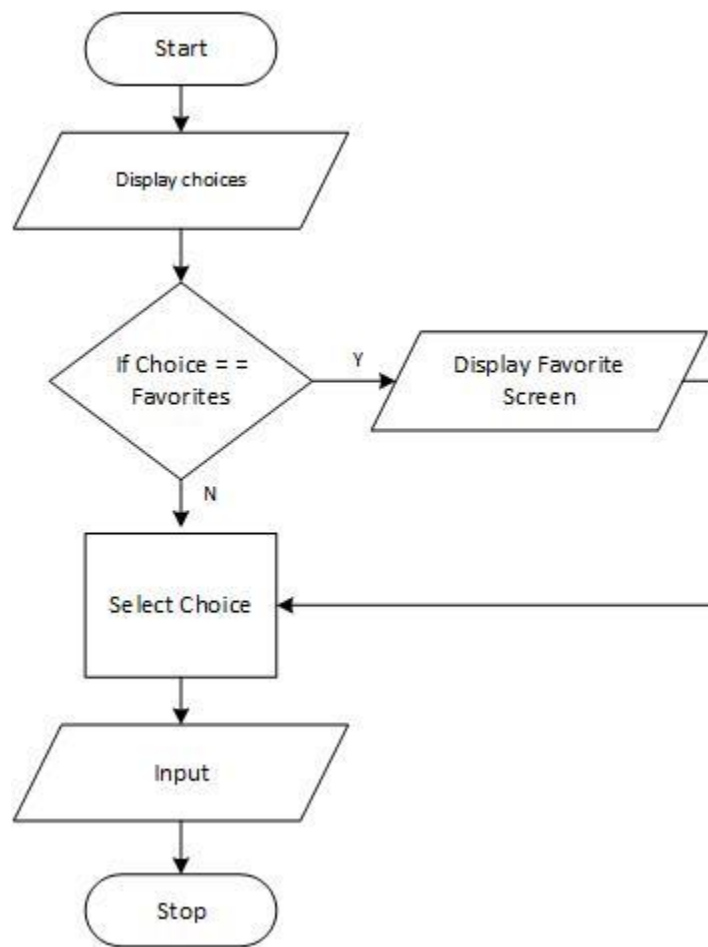
Figure 9. Developer Screen
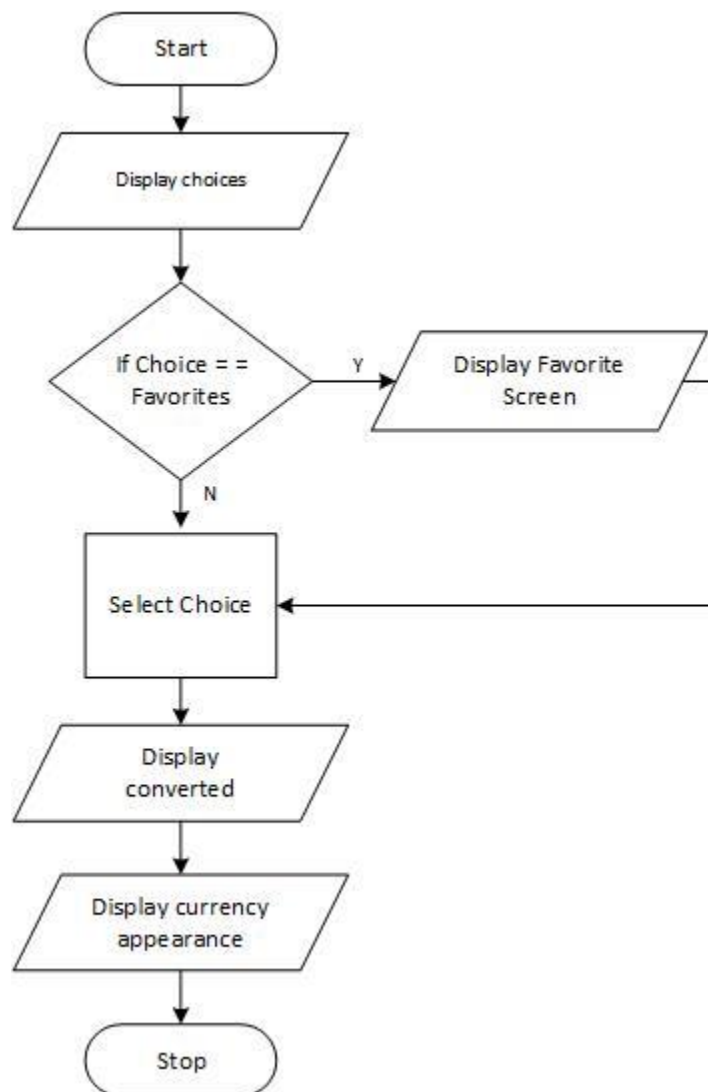
Figure 8. Selection Screen

Figure 9. Input Screen

Figure 10. Input Screen
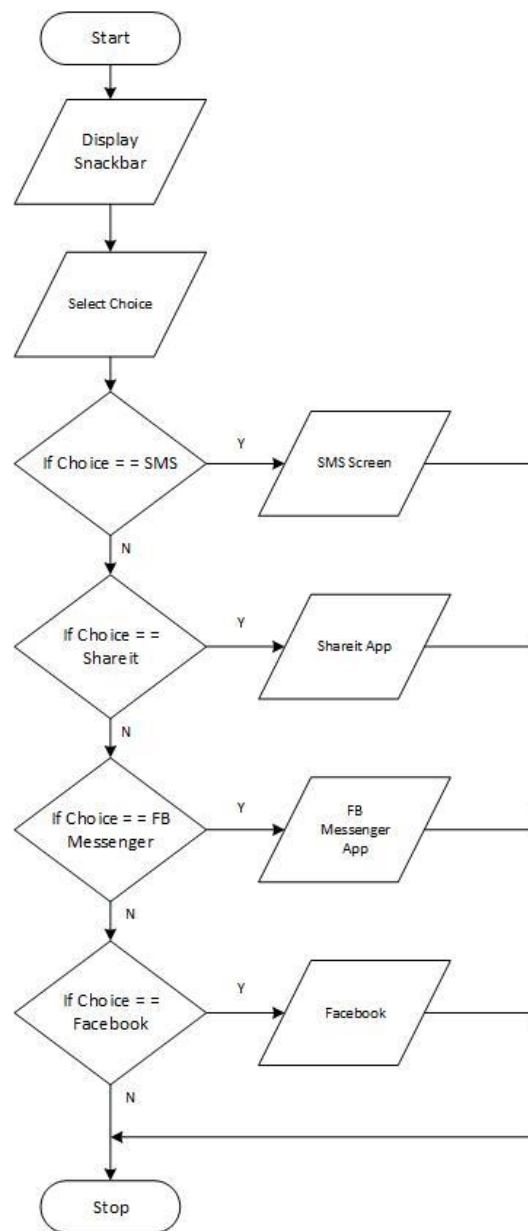
Figure 11. Share App Screen
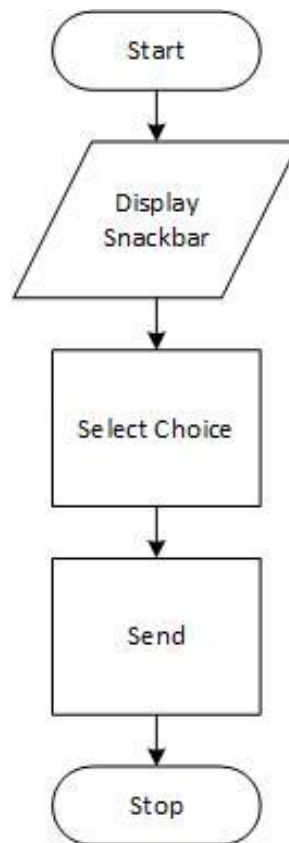
Figure 12. Feedback Screen

SCREEN LAYOUT

Figure 13. Launcher Icon

Figure 14. Splash Screen

This figure shows the icon of the iCurrency Converter application. This was used to launch the application and can be seen on their home screen or application drawer.

The Splash screen welcomes the user once the icon of the application is selected. It displays the name and the icon of the iCurrency Converter.

Figure 17. Main Scree

Figure 18. Update Notification

After the splash screen, this figure will be shown to the user. This will allow them to choose their desired countries with their respective flags.

In this figure, the user will allow to input any amount they want to convert. They can also view the currency appearance of the second selected country.
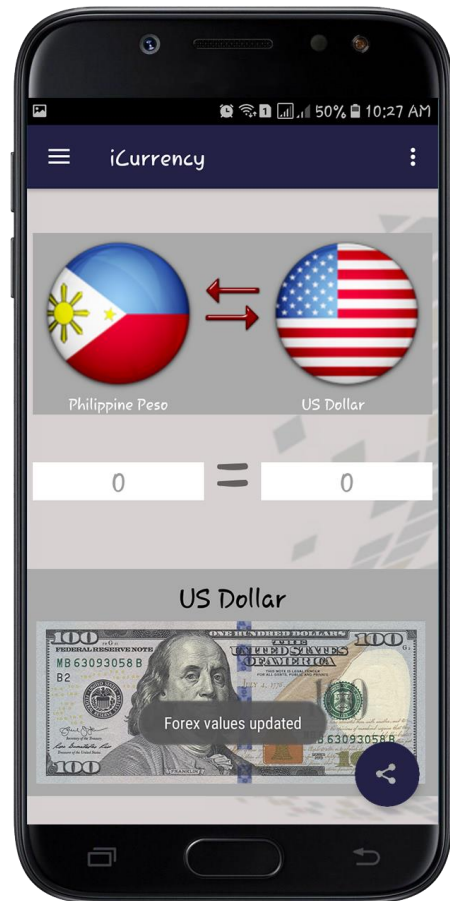
In this figure, it shows a notification regarding the updates of the iCurrency Converter. Updates only happen when there is an internet connection.

Figure 19. Settings

Figure 20. Selection Screen

In this figure, the user can see the setting button on the top right corner of the application. It consists of two choices, first is manual update and the other is the setting for the sound where you can mute or unmute it.
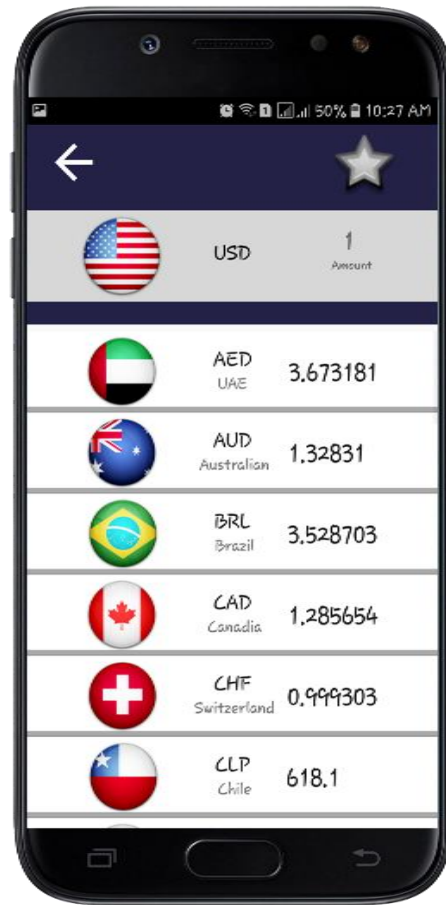
In this figure, the user can view the lists of the countries with their flags and respective exchange rates.

Figure 21. Add to Favorites Screen

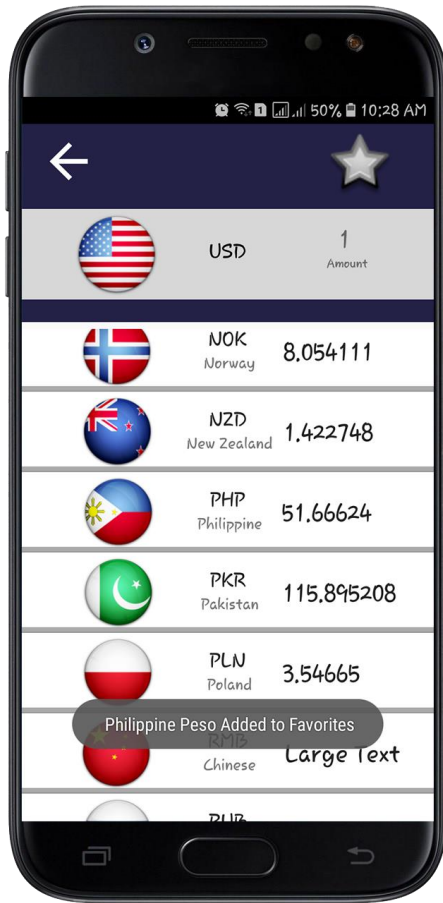F**igure 22.** Favorite List

In this figure, the user can set his/her favorite currencies by pressing it for more or less 2 seconds then the favorite button will appear.
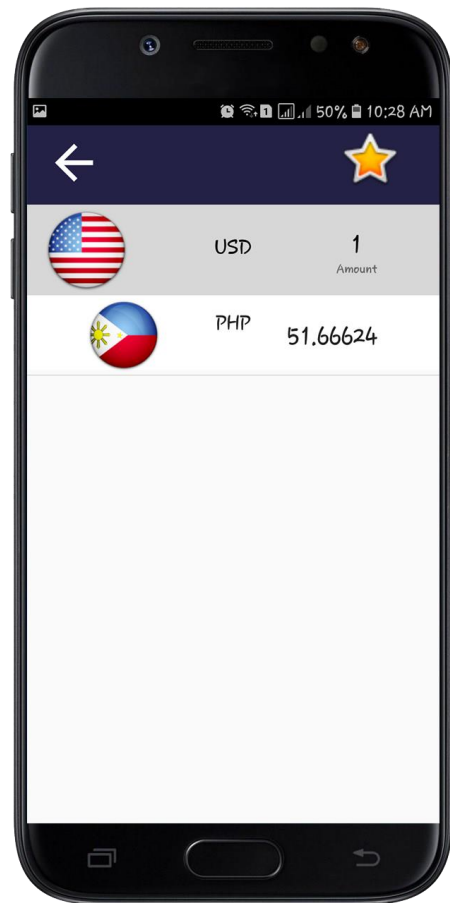
In this figure, the user will view his/her chosen currency that she/he sets to Favorites. This screen will also help the user to lessen the time he/she needs to locate or navigate the Currency he/she will use.

Figure 23. Input Screen

Figure 24. Share Screen

In this figure, the android keyboard will show up to allow the user to input the amount. In every data entered, there is a corresponding converted value.
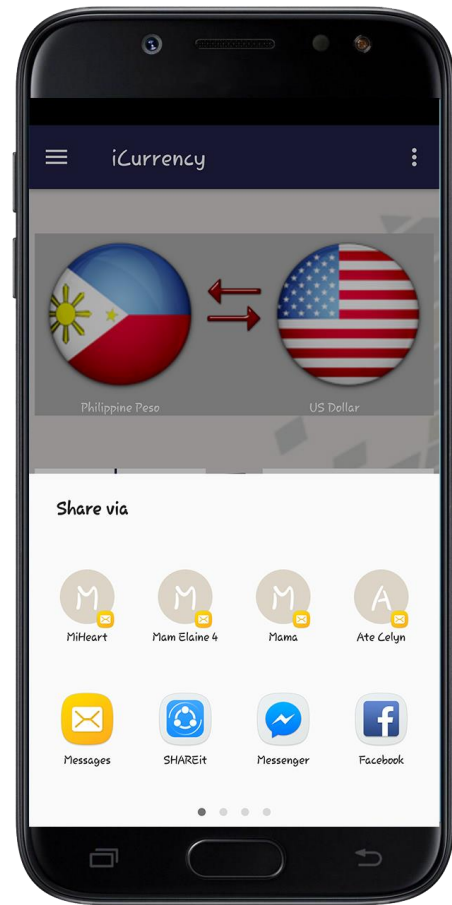
In this figure, the user can choose his preferred application where he can share the result of the currency conversion.

Figure 25. Share Screen
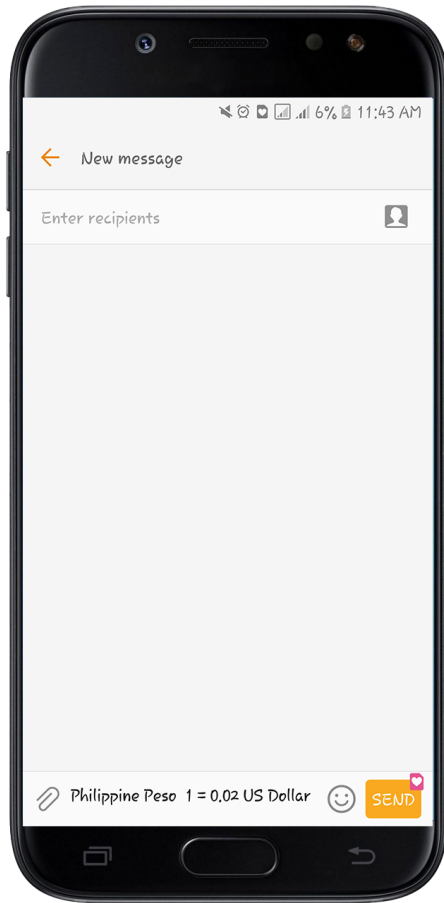

Figure 26. Information Screen
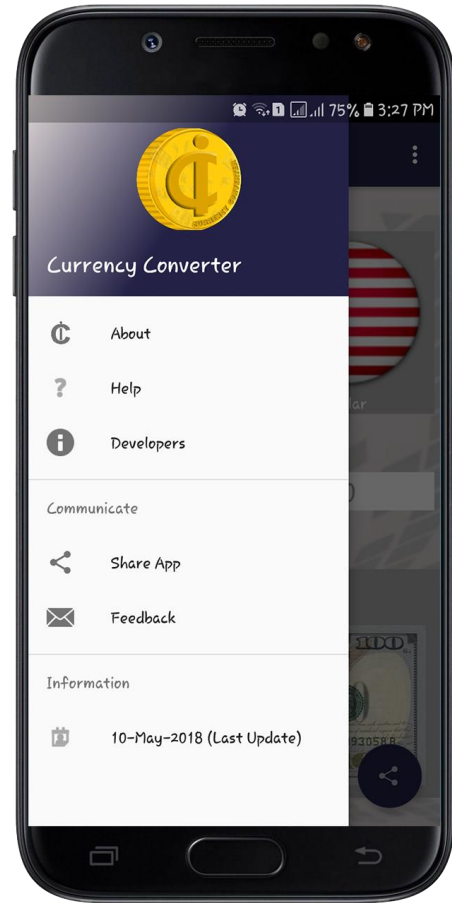
This is an example of sharing the result of currency conversion via SMS.

In this figure, it shows the information menu. It can be found on the upper left corner of the application. It contains the information about the iCurrency Converter, assistance needed on using the application and the creators of this project.
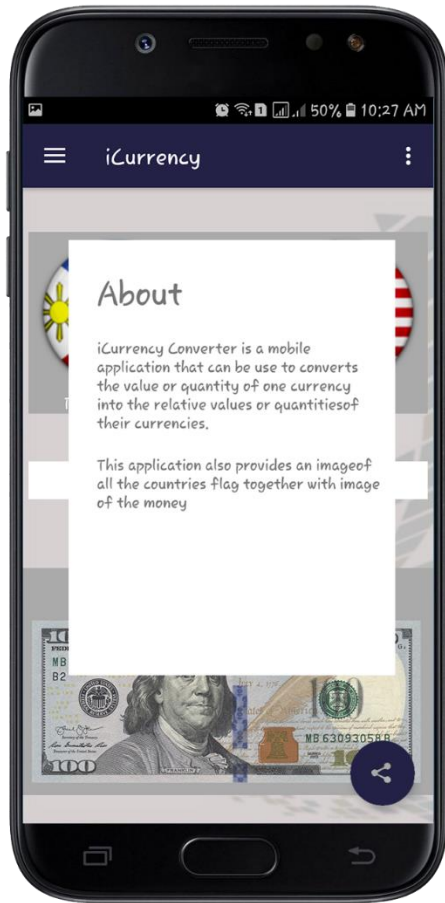
Figure 27. About Screen

Figure 28. Help Screen

It displays the application's brief definition and the main purpose of the application.

In this figure shows the iCurrency converter tutorial. It is a simple guide for the beginner for them to know how to use the application itself.
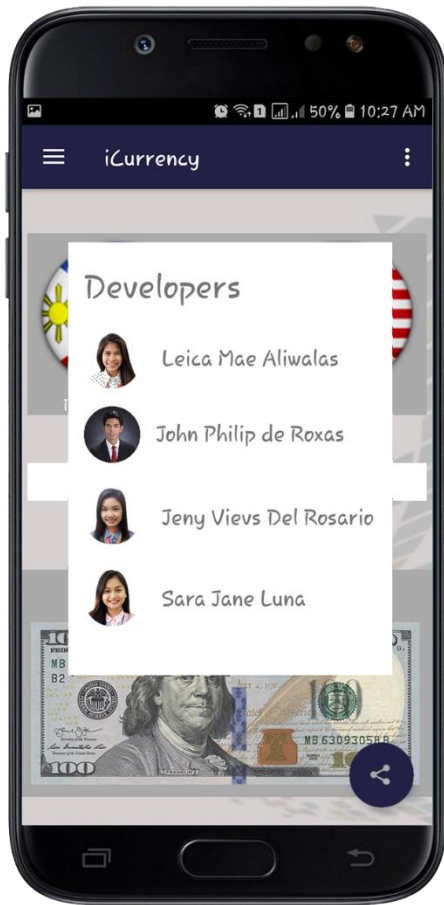
Figure 29. Developers Screen

Figure 15. Share App Screen

In this figure, it shows the developers of the application and all those who contributed on creating the whole application.

In this figure, the users can send the application by sharing the direct URL link.

Figure 31. *Feedback*

Figure 32. *Feedback Screen*

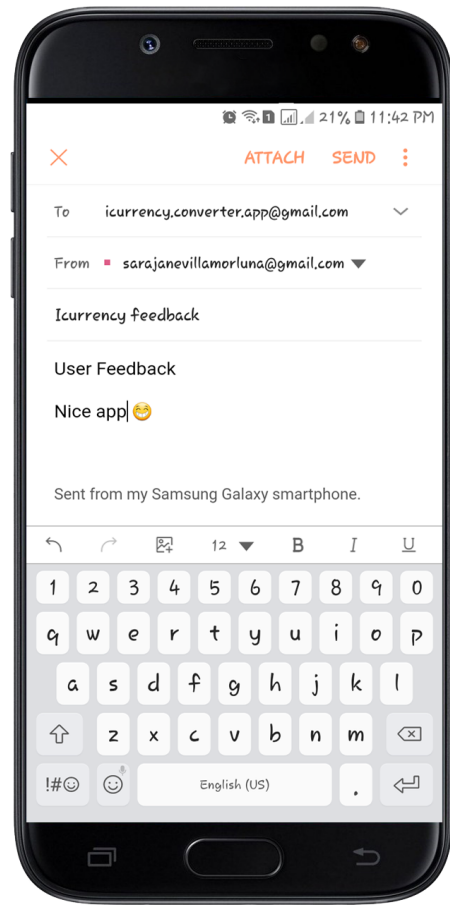In this figure, the users can send their feedbacks through different applications.

This is an example of composing an email of user's feedback to the developers.

5.0 SUMMARY, CONCLUSIONS, RECOMMENDATIONS

SUMMARY

iCurrency converter is simple calculator - like app developed using Android Studio and Java Programming Language. The said application was designed to provide real-time updates about the currencies of several countries. Its main features include providing fast and fuss-free conversion of one currency into another in order to check its corresponding value.

The researchers came up with the idea of focusing their subject on a currency converter for the sole purpose of extending their help to those people who are greatly in need with this type of tool. First and foremost, they have noticed that one of the most common problems faced by travelers is the inadequacy of knowledge about the updates regarding the rapid changes in exchange rates which often ruin their vacation. In addition to this, the users of this application was not limited with the travelers only, hence this app will also be a great help to people with relatives abroad or OFW workers and those people who incorporate in business to be aware and well-informed regarding the movements of exchange rates.

Moreover, iCurrency converter is suitable for android OS and can be used either online or offline. The users have the aptitude to update the application real-time and manually. The application contains the top 30 currency and allows the user to be knowledgeable and familiarized in the appearance of the currency of every country.

iCurrency is indeed a user-friendly application given that the instruction about the usage and how it works was indicated in the app. In relation to this, it also provides sounds containing brief information with regards to the currency from a respective country accessible just by a long press. From the list of the countries given, the users will be able to select countries which they commonly used by long press and add it to their favorites.

CONCLUSIONS

iCurrency Converter is a handy tool, simple, accurate and fast to be employed which is developed for converting currency of different countries. Users can easily know the current exchange rate in the market.

Android Studio and Java was used as programming language in the development of this application.

iCurrency converting tools are the most up-to-date answer to every question related to foreign currency exchange in today's world.

RECOMMENDATIONS

The future researchers can add country on the list since it only got the top 30 currencies in the world.

The researchers also recommend that instead of selecting the country on the list, future researchers can provide a search box.

The researchers recommend that the future researchers can add features which can automatically locate user's location via GPS and prompt to select the country and its respective currency.

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