MASTER OF INFORMATION AND COMMUNICATION STUDIES

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MASTER OF INFORMATION AND COMMUNICATION STUDIES

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TIPid

A financial management application designed for Filipinos

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18 May 2022

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TIPid

A financial management application designed for Filipinos

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27 September 2022

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Biographical Sketch

Mary Kristene D. Clariño was born on April 23 in Manila, Philippines. She earned her bachelor's degree in Computer Science from the University of the Philippines Los Baños. Before entering the academe, she was a software developer in a startup company. She currently teaches in De La Salle Integrated school for more than five years and pursued her master's degree in University of the Philippines Open University. Besides teaching and programming, she also manages small businesses and writes music as a hobby.

Acknowledgement

I thank God for the strength and opportunity to further improve myself. I thank God for the guidance and intervention in every decision and action that I make. I thank my family, especially my sister, Ate Maan, for the unending support and understanding. I am happy for all of our bonding moments and may we continue to grow. Thank you Lola and Lolo for all the good memories. I still cherish them up to this date.

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Thank you to our baby dogs (Monchang, Monai, Maria Rosario, Coraline, and Collette). Thank you for teaching me unconditional love and inspiring me to move forward. I am grateful to all the hobbies and interests I entered during the pandemic as a coping mechanism. Thank you Timmy and Kervin for always being a message away. You both have made my pandemic bearable.

Thank you School Rangers, especially Arm Weerayut, Alice in Borderland, especially Dori Sakurada, and Stray Kids, especially Lee Know for being sources of inspiration and happiness.

Dedication

Para sa Diyos at Para sa Bayan.
Para rin kay Monai at Maria Rosario, ang aming mga anghel.

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Abstract

Based on a survey by the Bangko Sentral ng Pilipinas, out of three financial literacy related questions only 8% of Filipinos can correctly answer all while less than half can only answer one question. Since mobile applications have been tools to aid users in various daily tasks, TIPid aims to be a financial management application designed for Filipinos. The application does not only provide money tracking features but also integrate tips and information for the awareness and habit building suited to our fellow countrymen.This aims to help the users retain their budget, observe their current financial situation, and be aware of different financial strategies.

Chapter I

THE PROBLEM DOMAIN

Statement of the Problem

Bangko Sentral ng Pilipinas conducted a survey where only 8% of Filipinos can correctly answer all financial related questions. Financial literacy is also not part of the Philippine educational system which the Department of Education has looked into expanding in the K-12 program this 2021 (Cervantes, 2021). In spite of that, the majority of the population is not aware of managing finances.

Background and Objectives of the Project

In terms of technology, most Filipinos are owners of smartphones.There was a prediction last 2015 that by 2018, 70% of Filipinos will own a smartphone (Camus, 2015). Since mobile applications have been tools to aid users in various daily tasks, TIPid aims to be (1) a financial management application designed for Filipinos through cultural labels and icons. The application does not only (2) provide money tracking features but also (3) integrate tips and information for the awareness and habit building suited to our fellow countrymen.

Significance and Scope of the Project

The application consists of money tracking features and financial reminders. Instead of Expenses, Income, and Savings, they are labeled as *Bayarin*, *Kita*, and, *Ipon*. The tracker enables the user to input and monitor values under each section. Default categories for each section are based on Filipino's daily activities such as

Jeep, *Trike, Tubig, Kuryente, Sahod etc.* There will also be a debt management feature. In every transaction, a reminder or tip is prompted in conversational Filipino language. This aims to help the users to retain their budget, observe their current financial situation, and be aware of different financial strategies.

Documentation of Existence and Seriousness of the Problem

There are multiple financial management applications available. Some require a one time purchase. Some are in subscription format. And some are for free with few to many ads. There are applications with multiple advanced features such as bank linking and allows multiple accounts. These applications focus on tracking, data presentation, and other features in the hope to set them apart from others. However, none of these applications integrate the cultural aspect of our country. TIPid does not aim to compete with the quantity of features provided by these apps. It aims to have a simple integration of tracking features with Filipino culture and financial tips.

Chapter II

REVIEW OF EXISTING ALTERNATIVES

There are multiple financial management applications available. Some require a one time purchase. Some are in subscription format. And some are for free with few to many ads. There are applications with multiple advanced features such as bank linking and allows multiple accounts. These applications focus on tracking, data presentation, and other features in the hope to set them apart from others. However, none of these applications integrate the cultural aspect of our country. TIPid does not aim to compete with the quantity of features provided by these apps. It aims to have a simple integration of tracking features with Filipino culture and financial tips.

During the project planning, data was gathered from various age groups. Based on the survey, the majority of the respondents track their income, expenses, and savings but only a quarter are still using a money management application. Almost half did not try any but more than 85% still think that apps can still help them manage their finances.

The respondents were asked what they would like to improve in the current money management applications. The tracking features need most improvement followed by the overall look of the app and tip feature. This tip feature is one of the major functionalities of TIPid. More than 50% also chose the financial literacy integration which TIPid also plans to implement. The respondents were also asked what topics they still need more information on. Mostly chosen topics were Budgeting, Stocks and Credit Cards.

Chapter III

APPROACH TAKEN IN THIS PROJECT

Theoretical Framework

The mobile application consists of three major components: *Kita* Tracker, *Ipon* Tracker, and *Bayarin* Tracker. Under *Kita* Tracker, users can add a value, and view his/her current money. In *Ipon* tracker, the savings goals can be viewed and set by the user (category and amount). An *ipon* amount can be added through add income or transfer from the current money. *Bayarin* Tracker consists of viewing the list of expenses and set budget for each category. A value can be added to each category which simulates a paid bill. A notification will appear about financial tips

Rationale for the Framework

The project uses the Scrum framework. Even if the project was done by one full stack developer, the principles involved in scrum development were applied. Larger functionalities were divided into sprints. This provided an overall view of the task given a set amount of time. The sprints were also documented through a gantt chart for easier viewing of the developer. This also provided an overall timeline of the project.

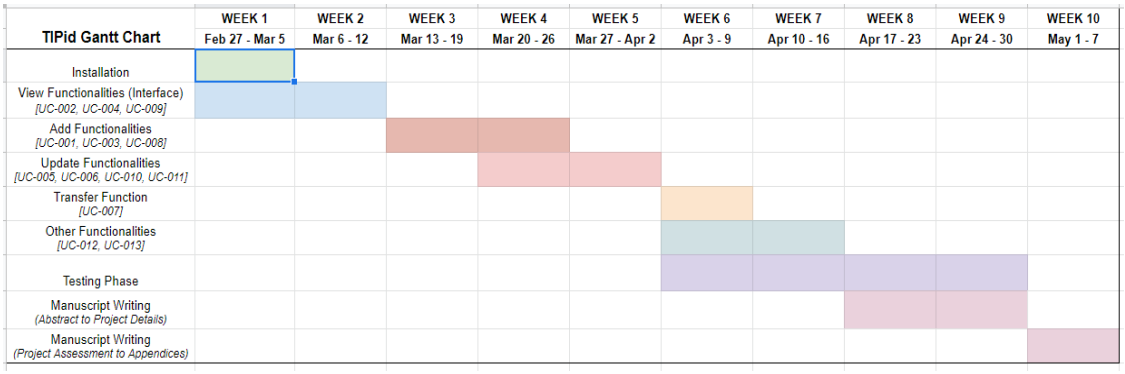

Fig. 1 TIPid Gantt Chart

As observed in Figure 1, the functionalities were broken down into separate weeks. Similar functionalities were also grouped for faster implementation of the different areas of the application.

Technologies used

Figma and Canva were used in creating the user interface prototype of the application. Prototyping was essential in the development to visualize the overall look and layout of the functionalities.

The mobile application was implemented in Microsoft Visual Studio Code in a Windows Laptop. For the front-end and back-end implementation, Ionic Framework and AngularJS were used. For the data storage, hosting and deployment, Google Firebase was utilized. This can also be used in the deployment of the application in Google Playstore.

For the backing up of the source codes, Bitbucket through Git terminal was used.

Chapter IV

SYSTEM DESIGN

System Features

The main categories are seen in the homepage. The user views the current money which is the difference between *Kita*, *Bayarin*, and *Ipon*. Current Money is the money left for the user to spend or save. The list of savings and goal amount are also seen in the homepage. This serves as a reminder for the user of his/her money goals. By clicking the arrow button beside *IPON,* money can be transferred to any of the categories from the current money. By clicking the plus button, *Kita* can be added.

By clicking the minus button, bayarin categories are viewed which also serves as the budget list. The user will see the current value of paid bills under each category. A value can be inputted to pay for any of the categories. There is also an option to update the budget amount.

An undo button is available at the upper right corner for any wrong inputs or actions. Notification alerts will be prompted as financial tips or status updates. The labels and icons are in conversational Filipino and present some Filipino icons.

Database Design

For the database, Google firebase was utilized. The following data are stored in each document or entry: `date`, `budget`, `halaga`, `galingSa`, `iponSa`, `paraSa`. Date is the entry date and time of the document. This is automatically detected and formatted by the system. Halaga refers to the user's input for kita,

bayarin, and ipon. The value under galingSa, iponSa, and paraSa indicates the category. Two of these areas are left as an empty string since one value only refers to either kita, bayarin or ipon. Budget is initialized but can be changed through Edit Budget or Edit Goal functionality. For Ipon, the goal is stored under budget. As observed, there are minimal fields to make the data storage simple.

Implementation

Fig. 2 User Interface Design of TIPid

Figure 2 shows the initial user interface design of TIPid. The layout was done using Canva. In week 1, I included installation of the necessary softwares and start of the view implementation. As observed in Figure 2, Visual Studio Code has been successfully installed in my local hardware. Visual Studio Code is used as the IDE. Ionic was also installed via CLI prior to Visual Studio Code. Ionic was also connected to the IDE during Week 1. This was executed to start off the interface implementation of TIPid.

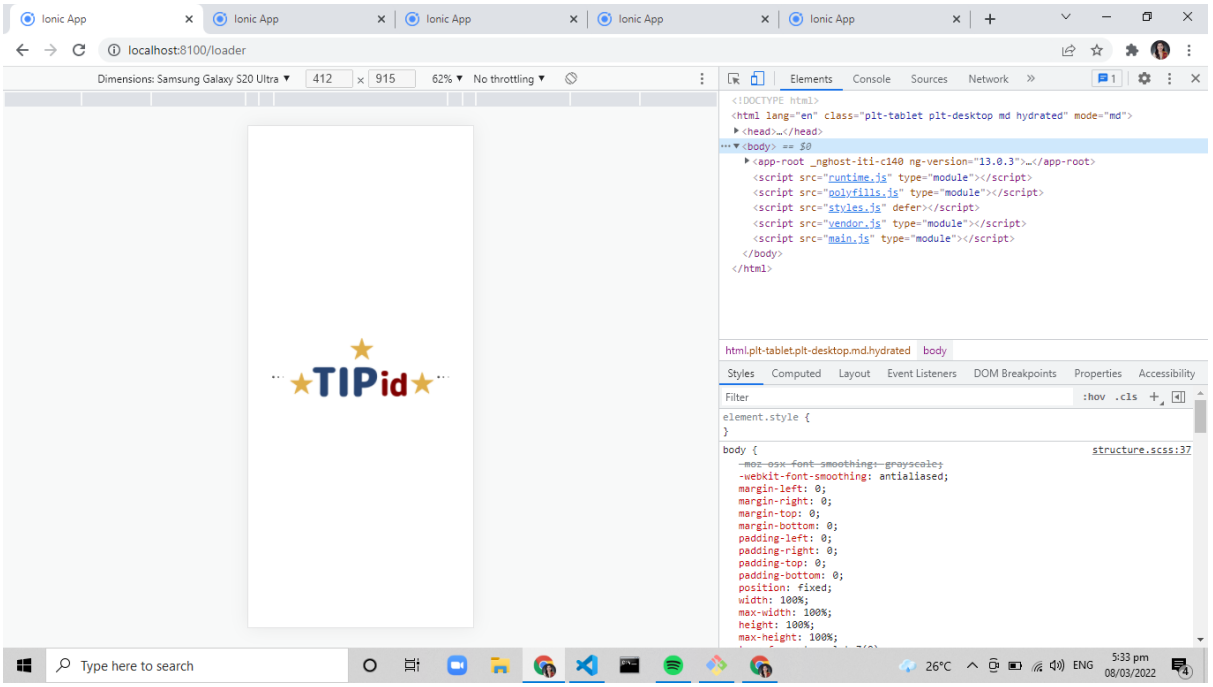

Fig 3. Loader Interface

In Figure 3, the loader page is presented. This was coded using Ionic with Visual Studio Code as IDE. The TIPid logo is shown along with mini progress bars placed at the sides.

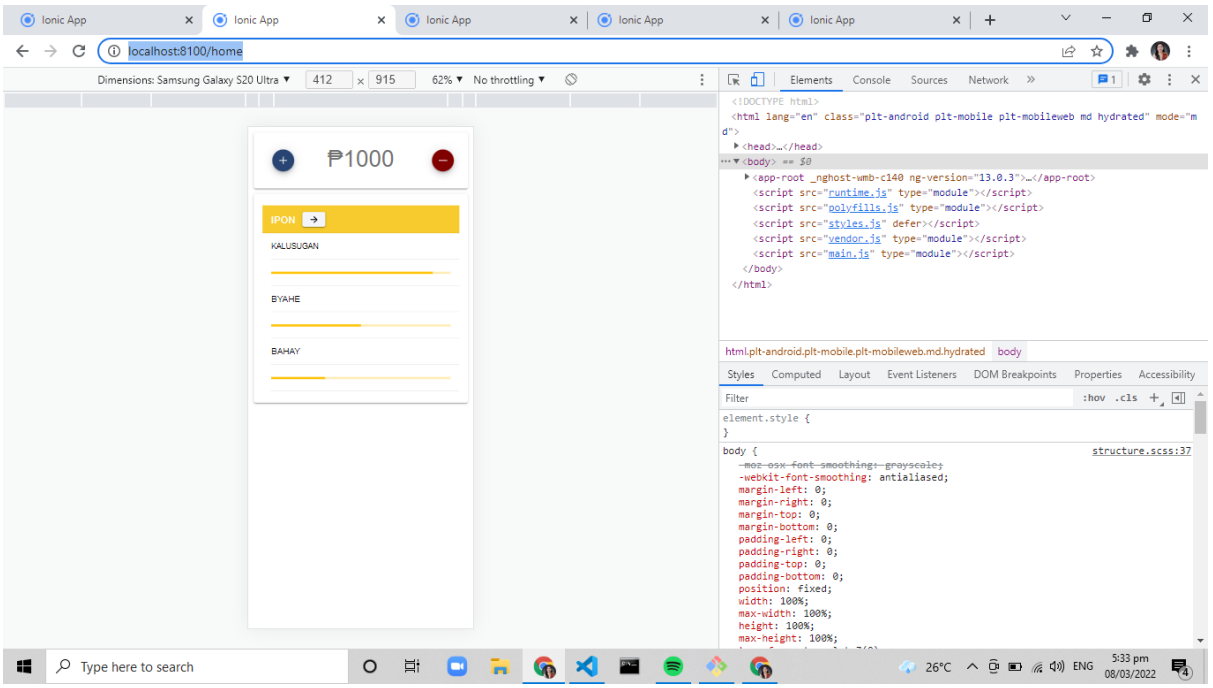

Fig 4. Home Interface

In Figure 4, the Home Page is presented. This corresponds to UC-002: View Current Money. This interface is also based on the prototype presented during IS295a. There is an Add and a Subtract button which refers to Kita and Bayarin respectively. The list of goals or ipon are also listed in this page which refers to UC-004: View Ipon Category List. Add Kita Form, Add Bayarin Form, and Ipon pages were implemented before the back-end implementation.

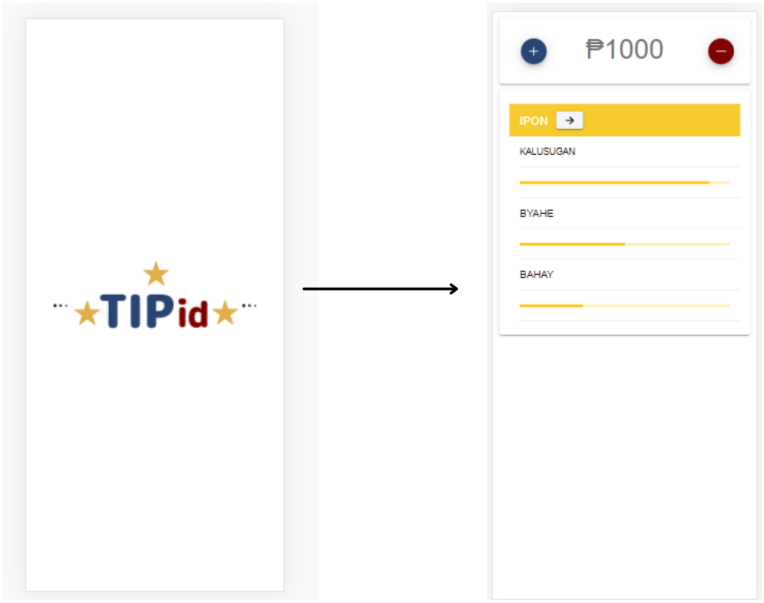

Fig 5. Loading Page to Home Page

After implementing the interface through Ionic, the back-end was implemented using Angular JS. The routes were arranged according to each button as seen in Figure 5.

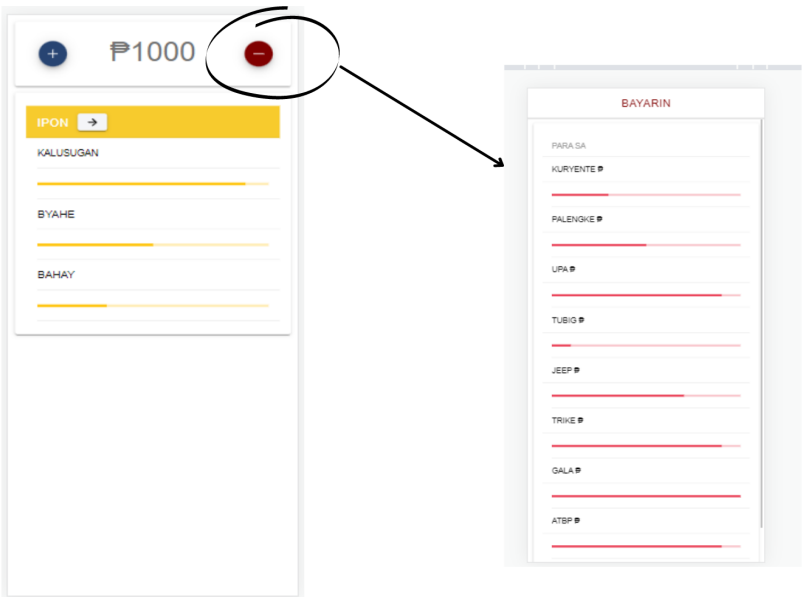

Fig 6. Home Page to Add Bayarin Form

After clicking the minus button, the add bayarin form appears. This can be seen in Figure 6. Same with the add kita, the onlick and navigation function was implemented. To access the ipon page, the user must click the right arrow button.

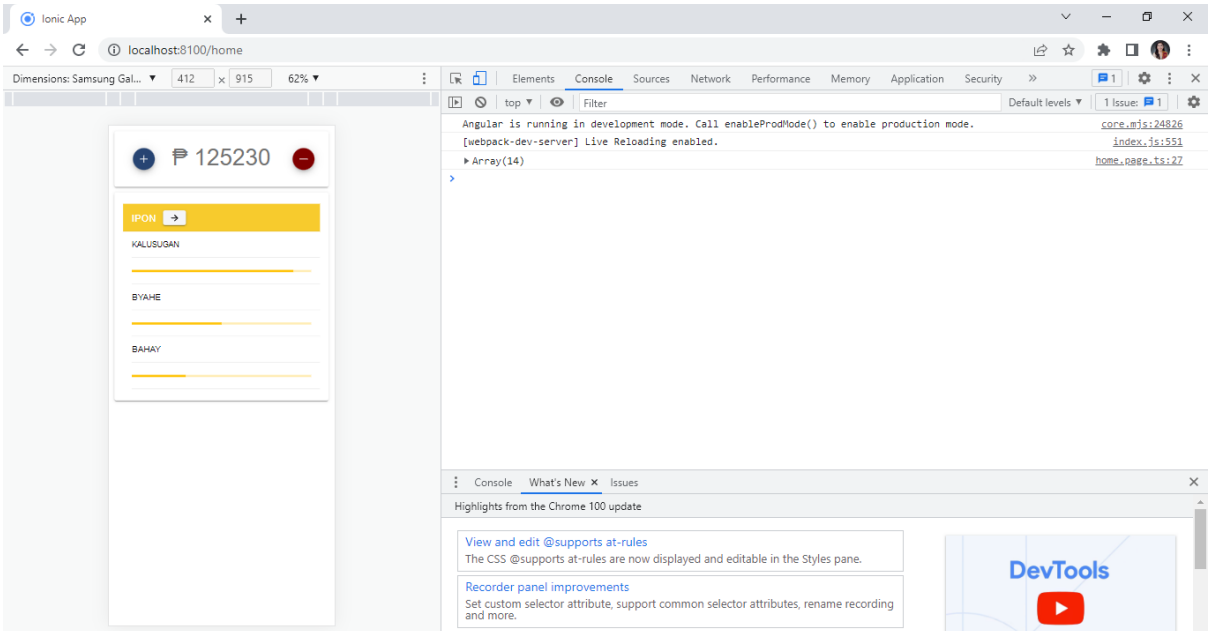

Fig 7. Home Page with Backend Implementation

The data storage was set-up using Google Firebase. The connection from the two platforms were established. This was done through npm install and config based on the functionalities of the application. As seen in Figure 7, the current money is reflected. In the add kita, bayarin, and ipon forms, the chosen category is detected. The value in *halaga* will be added or subtracted to the current money.

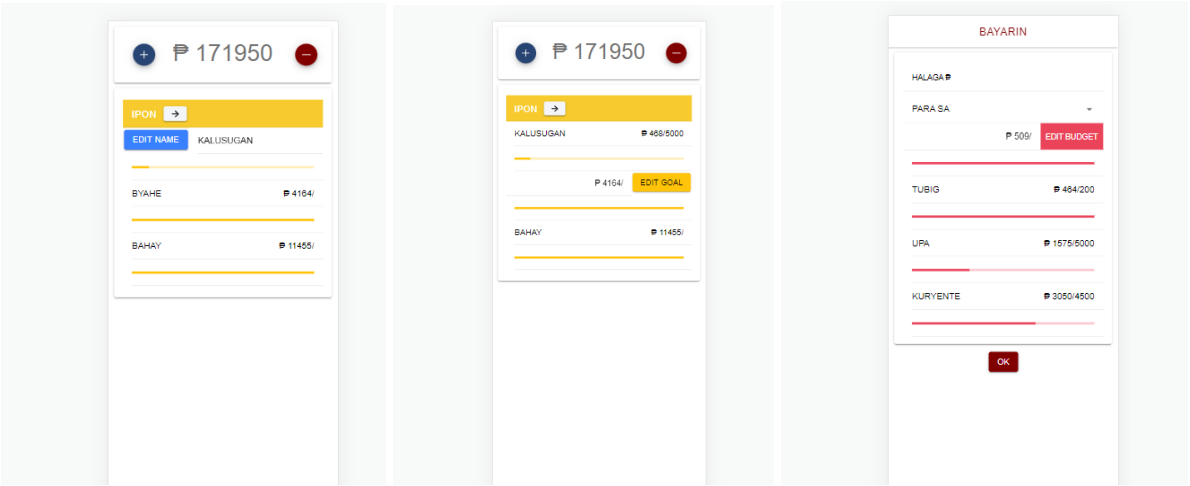

Fig 8. Edit Option Interfaces

After implementing the view and add functionalities, the update functionalities were developed. For simplicity, the user can slide or swipe right on the category name for the edit option to appear as seen in Figure 8. If the user slides or swipe right, edit goal amount for ipon and edit budget for bayarin appears. In ipon, and bayarin pages, the progress bar updates accordingly.

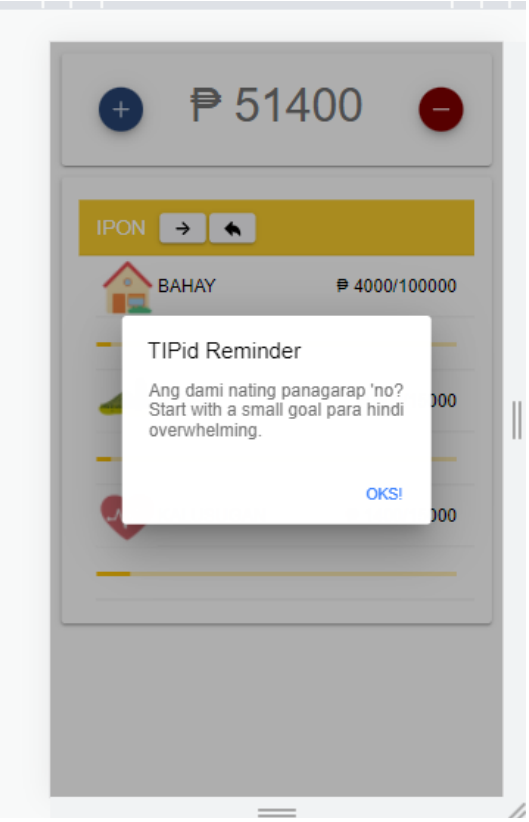

Fig 9. TIPid notification

In Figure 9, the TIPid reminder is observed. Random tips are presented to the users in conversational Filipino. This was crowd sourced through google form from fellow Filipinos with different age groups. As of writing, there are 11 respondents where each respondent has 6 tip entries. Entries are randomly shown in the application.

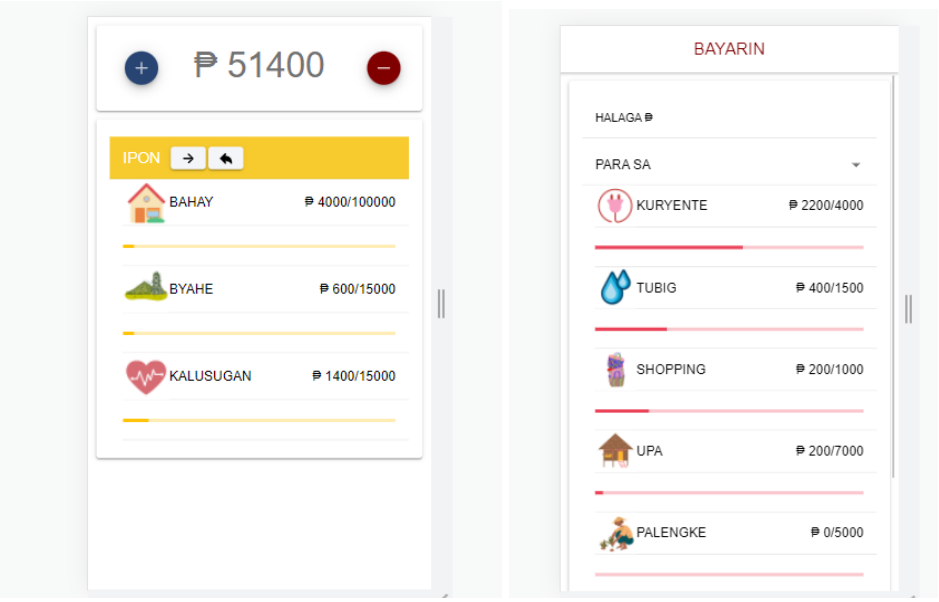

Fig 10. Deployed TIPid Application

The application was deployed through Google Firebase for remote testing. In future releases, the application can be accessed through Google Play Store since there is a linkage between the two platforms. As seen in Figure 10, the interface was further updated with Filipino icons representing our culture.

User Testing and Project Assessment

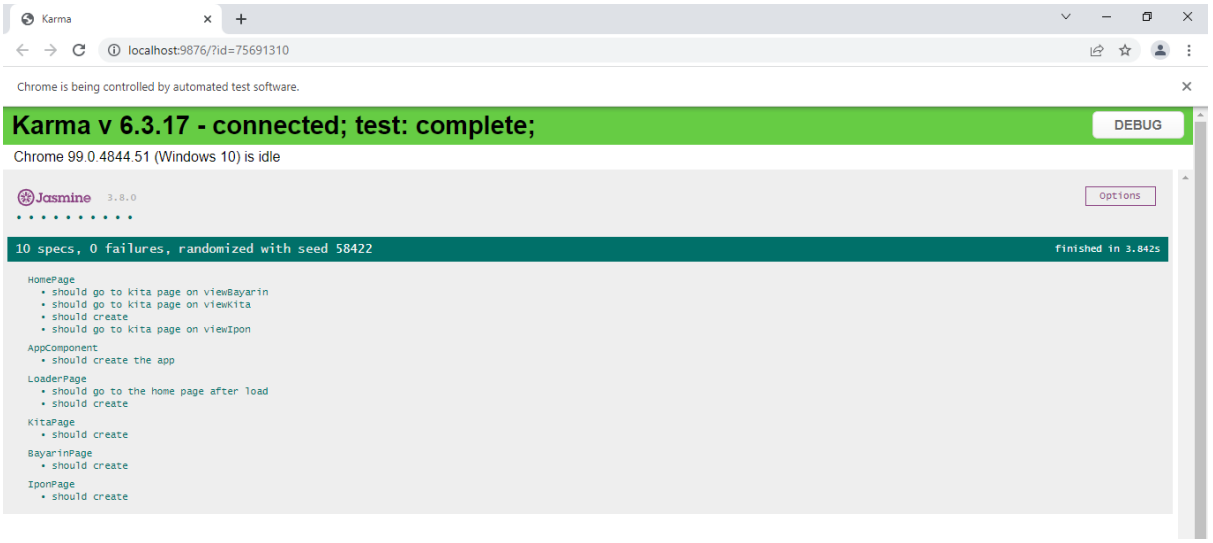

Fig 11. Test Page in Ionic

As seen in Figure 11, the current code is tested and there were no errors. Source code was also backed up via git and bitbucket. The application was also manually tested through the ionic serve output.

After deployment, there were some functionalities that were working locally but not working in the remote server. These areas were updated and implemented in a different approach to fix the errors appearing in the terminal.

As of writing, the application was remotely tested by 11 users from different parts of the country. They tested the application using different devices and various internet connections.

Majority of the users are from the millennial generation while the minority were from Gen Z. All are currently from the Philippines where the majority are from Cavite followed by Laguna and NCR. There was also a user from Puerto Princesa Palawan. Majority of the users were Single and graduated from Tertiary level.

Regarding internet connectivity, most used the Fiber set-up but the application was also tested using mobile data and cable connection. Around 81% of the respondents were using an iOS cellular phone. The app was still tested using Android Cellular Phone, iPad, Windows Laptop, and MAC.

Most users strongly agree that they felt confident using the application, would frequently use the system, found the functions well integrated, and imagined most people would learn to use the system very quickly. Majority of the users disagree that the system was cumbersome and unnecessarily complex. They also did not need to learn a lot before using the system or need technical support. All respondents disagreed to find any inconsistency in the system.

There was also a suggestion to further improve the interface by making some buttons noticeable especially for the elderly. Instructions such as a quick guide tour was also suggested to further help the users.

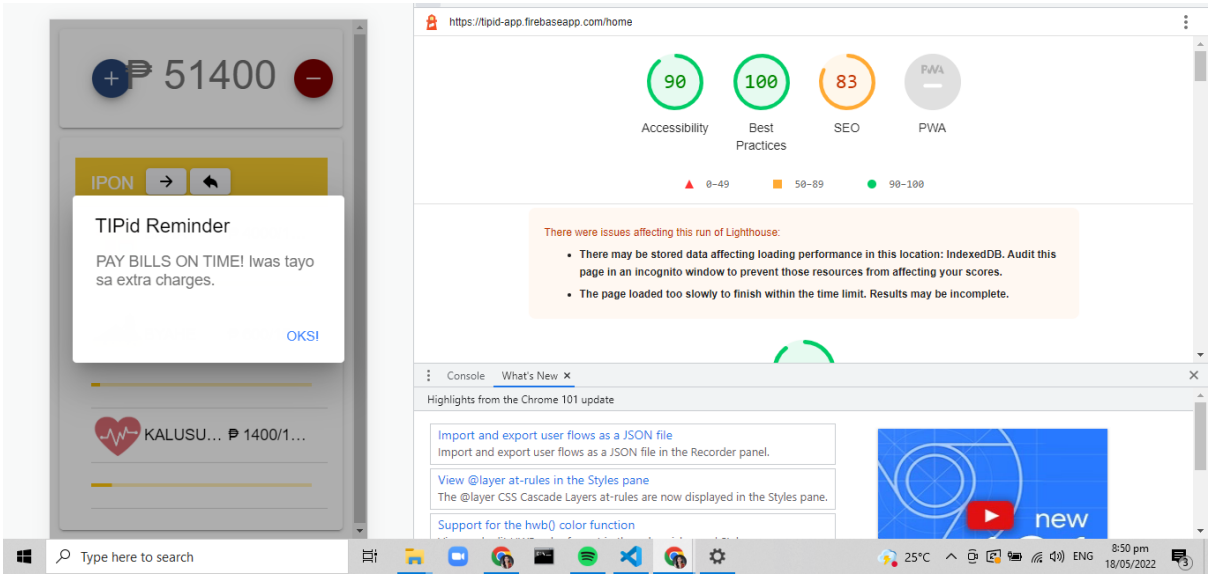

Fig 12. Lighthouse Report

As observed in Figure 12, the performance of the application was also verified using the Lighthouse Generate Report. Based on the results, the application has 90% Accessibility, and 100% Best Practices. The SEO is for improvement with 83% in the report.

Chapter V

RESULTS AND DISCUSSION

The project was completely implemented by one full stack developer which required better planning to be more efficient in the development time. In this project, the developer was able to adapt to the latest technology and study the practices done in each platform. A good aspect in the project is the full development control and planning. The proposal became the overall guide for the system implementation.

Some difficulties encountered was setting up and connecting the different platforms. This was resolved through accessing different references to learn the best practice and solution to the problem. There were also some functionalities working locally but then not working once deployed. The source code was adjusted accordingly since the deployed version is the priority for user testing.

For maintenance, the same technologies will be maintained. The source code will be adjusted based on user feedback to cater to the overall audience.

Chapter VI

CONCLUSIONS

Bangko Sentral ng Pilipinas conducted a survey where only 8% of Filipinos can correctly answer all financial related questions. Financial literacy is also not part of the Philippine educational system which the Department of Education has looked into expanding in the K-12 program this 2021 (Cervantes, 2021). In spite of that, the majority of the population is not aware of managing finances.

TIPid aims to be (1) a financial management application designed for Filipinos through cultural labels and icons. The application does not only (2) provide money tracking features but also (3) integrate tips and information for the awareness and habit building suited to our fellow countrymen.

There are multiple financial management applications available.IPid does not aim to compete with the quantity of features provided by these apps. It aims to have a simple integration of tracking features with Filipino culture and financial tips.

The mobile application consists of three major components: Kita Tracker, Ipon Tracker, and Bayarin Tracker which were implemented using the latest technologies. Tips from fellow Filipinos are notified along with Filipino labels and icons.

Overall, the application was developed according to the planned proposal.

Chapter VII

RECOMMENDATIONS

Based on the user testing, the interface will be further improved to cater other generations especially the elderly. In spite of the positive feedback, a quick guide tour will still be set-up for the benefit of all users. Although the results of the lighthouse report were relatively high, the performance of the application can still be improved.

TIPid reminders were already crowdsourced but moving forward more inputs and statements will be included in the library. Currently, icons were retrieved from the Canva Library which were for commercial use. Icon selection with custom designs by Filipino artists is an area to be explored in the future.

Once these improvements are integrated, the application can be deployed in Google Playstore. The application is currently hosted via Google Firebase so deployment to play store is highly feasible.

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Appendices

APPENDIX A

Github Source Code:
https://maryclarinodev@bitbucket.org/maryclarinodev/tipid-app22.git

Crowdsourcing TIPid Reminder:
https://tinyurl.com/moneytip22

User Testing Survey:
https://tinyurl.com/TIPidTest

Remote Testing:
https://tipid-app.firebaseapp.com/home

Slide Presentation:
https://tinyurl.com/TIPidSlides