

CONFERENCE PROCEEDING

myPLANET Application: An Innovative Recycling System

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ABSTRACT

Recycling is the process of collecting waste materials and breaking them down into building blocks of new products. An efficient waste management via recycling is essential to protect the environment and health of human population. However, the recycling rate of Malaysia is estimated at 10.5%, which is still relatively low compared to the other countries. The community is still unaware about recycling, they have lack of confidence and awareness in recycling, thus leading to disposal of recyclable wastes. Therefore, a recycling tracking application called myPLANET was developed to encourage public to recycle their waste thus reducing the waste dumping in oceans and landfills. We also want to develop myPLANET application using Android Studio which consists of Kotlin, XML and Firebase, and guide users on how to recycle using the futuristic features in myPLANET app. Modern problems require modern solutions. Aside from Google's Firebase, which will be used for user authentication, data storage, and artificial intelligence, we also used XML, which defines properties and the layout of objects in the app. Moreover, this apps utilized APIs (Application Programming Interfaces) that allows applications to communicate with each other, and Kotlin, which is the framework, to create the myPLANET application using Android Studio. As a result, a tracking system was deployed in the application which would track the stages of recycling processes. Besides that, a guidelines and FAQ page, mapping system of recycling centres, reward system and recycling programs were also administered to make the objectives of our apps come true. This app will be a steppingstone in meeting towards Malaysia's goal of a 40% recycling rate by 2025 and achieving net zero carbon emissions by 2050.

Keywords: *myPlanet application, recycling process, tracking system*

INTRODUCTION

Our solution for a better environmental sustainability in the world is a Recycling Tracking Application, named "myPLANET". myPLANET will encourage people to participate in the noble act of recycling. We are confident in our application's ability to be able to help the community to recycle effectively. The innovative features that our app offers would not only be able to bolster the rate of recycling, but in the long run, make an impact on global warming. myPLANET offers the user a neat and user-friendly UI, and a way to get rewards for their efforts.

When compared to other countries, the recycling rate of Malaysia is estimated at 10.5% which is relatively low. Lack of confidence, awareness, motivation, knowledge, and information lead to the decreases of the rate of recycling in Malaysia. 1 in 2 adults say that their recycling behaviours are affected by whether the items actually get recycled or just gets dumped to the landfill. While every 4 out 5 adults who do not recycle say that they would recycle more if they had more guidance and

facilities. Lack of information on what happens to recyclables after collection negatively impacts the public. Users do not know whether their items are actually recycled or thrown away into landfills. In addition to lack of certainty, consumers also expressed a great lack of confidence in the recycling system, with only one-third of the community believing that only a quarter of what they put in their recycling bins is actually recycled. Due to the lack of knowledge on the recycling system, users commonly send contamination along with their recyclables. In 2017, 1 in 4 items that were sent to be recycled were contaminated. This would cause thousands of tons of valuable recycling to be diverted to the landfill, not by the user, but by the recycling plant. The current recycling system is not transparent. Lack of confidence, awareness, motivation, knowledge, and information all comes into play when it comes to the low recycling rates.

The goals of our project are to reduce the waste dumping in oceans and landfills and recycle these wastes into beneficial new products. We also want to develop myPLANET application using Android Studio which consists of JAVA, XML and SQLite, and to guide users on how to recycle and build confidence using the futuristic features in myPLANET.

We are confident that this app will be a steppingstone towards achieving net zero carbon emissions by 2050. myPLANET will collaborate with companies, organizations, and governments to make this goal realistic. People will be more aware of what they consume and how it impacts the environment. This project will create new job opportunities that will lead to economic growth. Cities and communities around the globe will be more sustainable as carbon emissions will be greatly reduced because recycling will be more prevalent due to the impact of myPLANET. These goals are in accordance with the United Nation's 17 Sustainable Development Goals.

METHODOLOGY

Development of myPLANET's User Interface

To develop an app, first, you need to design the layout. In Android Studio, the layout is designed using a type of file called XML, which stands for Extensible Markup Language. It is used to define the position and the characteristics of objects in the app, like images, buttons, and text fields. XML is used to change the color and behavior of buttons, for example, to give the UI a more aesthetic feel.

Development of myPLANET's Framework

The next step is to add the functionalities of the app, using Kotlin, which will be the framework of our app. The framework is used to put the functionalities into our app. For example, if we wanted an app to go to another page when a button is pressed, or if we were to connect a database to our app, Kotlin will be used. For each activity created, which is a page in Android studio, there will be a Kotlin activity file and XML layout file for us to customize the look and functionalities of the page.

Development of myPLANET's Back-End

SDK will also be used to develop myPLANET. SDK is a set of software tools and programs used by developers to create applications for specific platforms. SDK tools include a wide range of things, including libraries, documentation, code samples, processes, and guides which developers can use and integrate into their own apps. SDK would be used from the first time the user would open the app, for example the multiple sign-in options the user would have to save their personal credentials.

API, also known as Application Programming Interface, is usually packaged into a SDK. API is a software intermediary that allows two applications to talk to each other. In our project, APIs are used to display the map near the user, to generate unique QR code for each user every time they recycle, to collaborate with other apps to redeem green points and to connect to social media.

To develop the myPLANET application using Android Studio, we used Kotlin, which is the framework, XML, which defines properties and the layout of objects in the app, SDKs (Software Development Kits) which are sets of software tools and programs used to create applications, APIs (Application Programming Interface) which allows to applications to talk to each other, and Google's Firebase, which will be used for user authentication, storage of data and artificial intelligence for recommendation of recycling location and redemption of green points.

RESULTS AND DISCUSSION

Survey

We conducted a survey on teenagers aged 13-18 to gain insides on their recycling habits. Another survey was also conducted on selected participants, they were given a prototype of our application and were asked to give feedback and opinions.

We learned that the recycling rate that was received was quite positive, with 65.9% of participants saying that they do recycle. Though in a further question, it was received that only 2.4% of participants said that they recycle very often. This shows that when you take everything into place, the recycling rate among the participants is still below average.

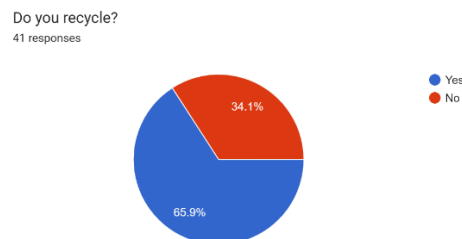


Figure 4. Responses of survey conducted

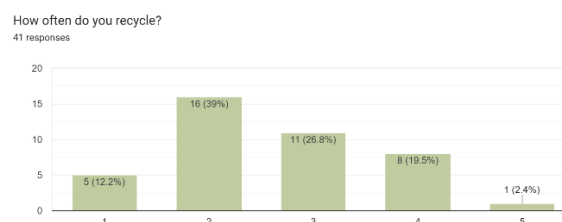


Figure 2. Responses of survey conducted

This survey also shows us that the majority of people believe they know how to recycle properly when in fact they don't. 58.5% of participants stated they possess the knowledge to recycle properly, yet when their knowledge was tested in further questions, The number should be lower.

Do you know how to recycle properly?
41 responses

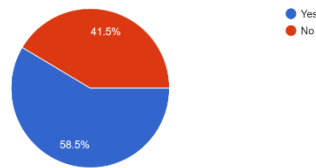


Figure 3. Responses of survey conducted

All of the participants agreed that they will recycle more if given more guidance and facilities. 95.1% of them also stated that they will be more motivated to recycle if given rewards. This is further backed up when the majority of responses to Section D, Question 1 is to give rewards to motivate people.

Would you feel motivated if you are rewarded after you recycle?
41 responses

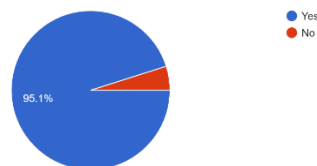


Figure 4. Responses of survey conducted

From the feedback on the app, the participants all 100% agreed that the app states its purposes and function, the app's UI is neat and clear, and the app will make people interested in recycling. While 85.7% of the participants fully understand how to use the app and stated that they have never used an app like ours. All of the participants also rated the innovativeness of the features of the app high or very high.

Does the app clearly state its purpose and function?
7 responses



Figure 5. Responses of survey conducted

Do you fully understand how to use the app?
7 responses

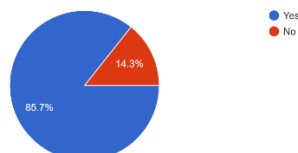


Figure 6. Responses of survey conducted

Have you used an app similar to this?
7 responses

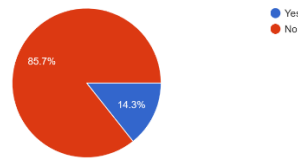


Figure 7. Responses of survey conducted

Rate the features of the app based on its innovativeness
7 responses

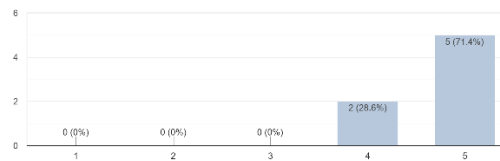


Figure 8. Responses of survey conducted

From the survey that we have done, we are confident that our app is able to increase the rate of recycling, through the fact that our app will provide guidance and rewards to those that wish to recycle. Our app will also teach them how to recycle properly.

CONCLUSION

In conclusion, myPLANET app is a convenient and easy-to-use application for all users. The innovative features included in the app would revolutionize the act of recycling, making the process easier as a whole and attracting more people to it. myPLANET is an essential tool in achieving the goal of zero net carbon emissions by 2050. With the futuristic and realistic solution for the recycling issues, there will be no problem for the community to achieve the targeted recycling rates in 2025. A community with a better and eco-friendly life will be pioneered by myPLANET.

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REFERENCES

- Malaysia Versus Waste. (n.d.). Brunel University London. Retrieved September 11, 2022, from <https://www.brunel.ac.uk/news-and-events/news/articles/Malaysia-Versus-Waste>
- Vilella, M. (2021, August 30). Zero Waste – a Key Solution for a Low-Carbon Economy. Zero Waste Europe. Retrieved September 11, 2022, from <https://zerowasteurope.eu/2015/03/zero-waste-a-key-solution-for-a-low-carbon-economy/>
- Android App Development For Dummies. (n.d.-b). Google Books. Retrieved September 11, 2022, from <https://books.google.com.my/books?id=nDqkBgAAQBAJ&lpg=PA1&ots=mMvufx3i7g&dq=Android%20App%20Development%20For%20Dummies&lr&pg=PP1#v=onepage&q=Android%20App%20Development%20For%20Dummies&f=false>