UTM
UNIVERSITI TEKNOLOGI MALAYSIA

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Section 5

PHASE 1: PROJECT PROPOSAL & PLANNING

Low Carbon Initiatives Community Monitoring System

Team 6

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1.0 Introduction

In Malaysia, the low-carbon reduction framework encompasses a multimodal strategy to tackle environmental issues and advance sustainable development. Due to its heavy reliance on fossil fuels, Malaysia is confronted with issues regarding climate change and carbon emissions. The government, business community, and communities at large have all adopted low-carbon reduction policies as a result of growing public awareness of the effects of human activity on the environment.Malaysia has developed and implemented laws and activities targeted at lowering carbon emissions with notable success in recent years. The government has established aggressive goals to increase energy efficiency, promote sustainable practices in a variety of industries, and switch to renewable energy sources. These actions meet Malaysia's obligations under international accords and are in line with efforts being made worldwide to reduce climate change.With Malaysia, business is beginning to understand the value of low-carbon and sustainable practices. To lessen their carbon footprint, businesses are introducing energy-efficient procedures, embracing eco-friendly technologies, and taking part in CSR campaigns.Malaysia has implemented several policies and measures in the domains of government, industry, and academics to reduce its carbon emissions. The efforts being made to shift to renewable energy, enhance energy efficiency, and implement low carbon concepts into urban planning are manifestations of the dedication to sustainability. In order to achieve a sustainable and low-carbon future, cooperation among stakeholders as well as continued research and education will be essential as Malaysia works to reach its environmental goals.

2.0 Background Study

For the last decade, Malaysia has been a leading example for taking many serious steps towards Environmental Sustainability (UNDP, January 27,2023). Since CO2 emissions are considered to be one of the most serious issues that causes a heat trap on earth, threatening and affecting our environment. “Atmospheric levels of the three main greenhouse gases warming our planet - carbon dioxide, methane and nitrous oxide “ (WMO October 26 ,2022) Malaysian citizens throughout the years have been seeing tangible changes in their day to day life towards a better, healthy and a sustainable environment. Our project is an effort to overcome the challenges initiatives might face in the process of collecting data, spreading awareness and connecting with people, While directing and guiding their CO2 consumption. By using a software system that will effectively collect and analyze data, guid the users attitude and behavior, as well as providing them with strategies towards the targeted goals. In this project, We will follow System Analysis and design (**SAD**) ; methodologies and principles in building a robust software.

With all these challenges, The Johor government with the collaboration of local authorities have been shaping the path towards a low-carbon society. The visionary Low Carbon Blueprint for Iskandar Malaysia 2025 has set down a robust framework that encompasses five local authorities on the mission to achieve a significant 58 percent reduction in carbon emissions by 2025. Among these ongoing efforts the Iskandar Puteri City Council (**MBIP**) have launched an initiative under the name of Iskandar Puteri Low Carbon (**IPRK**) at which their main aim is to stay connected with different communities in order to gather reliable and consistent data on CO2 consumption. In 2019, **MBIP** attempted a competition with incentive rewards encouraging people to reduce their electricity and energy consumption. but ultimately the challenges were affecting the progress, through missing out on important **SAD** principles.

Hence, Our software will integrate a variety of technologies,starting from collecting data using user-friendly methods to being able to report regional surveys that enjoy a diverse range of participants. Consequently, having the access to analyze all these data using data analysis technologies along with automatic processing and data calculations of valuable information such as electricity and energy consumptions. Also it is expected to give the users a monitoring option to observe their progress and their impact on the environment.

3.0 Problem Definition (problem statement?)

In 2019, the **IPRK** faced challenges that did impact the effectiveness of the initiative. The issues provided are vital to any system, neglecting them will significantly affect the whole process. Starting with time-consumption that negatively and financially impacts all stakeholders involved, due to the usage of old and replaceable methods. We have also seen that there were no intentions to automate the process of Co2 consumption calculation along with the reporting mechanism as they were both done manually which is highly exposed to human error and inflexibility within operations. Besides that there were no indications on having data analysis technology and information processing, which will play a key role to guide through the whole process and answer the stakeholders' questions. Also, There was no consideration for different user profiles, failing to diversify and include all types of citizens. This will generate neither a biased nor a reliable result. It was also obvious that some citizens were deterred at the entry process, due to extensive participant information requirements. It is mentioned that physical kiosks were provided due to the failure of choosing an appropriate familiar platform. Also there were no long-term methods to further connect and communicate with participants after the **IPRK** had ended.

4.0 Proposed Solution

To address these challenges effectively, the development of a comprehensive software solution is required. This solution should streamline data entry, reducing the time and effort required from participants, and eliminate the burden of outdated methods. Automation of CO2 consumption calculations and regional reporting will ensure accuracy and flexibility, reducing the risk of human error. The incorporation of data analysis technology will provide the initiative with the tools to gain valuable insights and guide stakeholders through the process, addressing critical questions and making informed decisions.

A flexible user profile system is essential to cater to the diversity of citizens, ensuring unbiased and reliable results. The software should also simplify participant information requirements, making the entry process more accessible. Providing a user-friendly interface will eliminate the need for physical kiosks and ensure participant familiarity with the system.

Finally, a long-term communication strategy should be built into the software, allowing for ongoing engagement with participants and stakeholders, through providing a dashboard designed specifically to show the users their CO2 consumptions in visual representations, which will keep them engaged all the time. By addressing these challenges, the **MBIP** initiative can become a more efficient, accessible, and effective tool for promoting low-carbon behavior within the Iskandar Puteri community.

The City Council (MBIP) can make a significant contribution to reducing the carbon footprint of individual commuting in Iskandar Puteri by promoting the use of electric vehicles and putting in place reliable public transportation systems. Urban planning that prioritizes green spaces, pedestrian-friendly areas, and sustainable architecture not only improves the quality of life for residents but also helps achieve low carbon goals. As part of the city's development plans, MBIP can actively promote these eco-friendly practices. In order to decrease dependency on fossil fuels even more, MBIP has the potential to encourage companies to implement eco-friendly technologies and direct funds intended for municipal infrastructure toward the purchase of renewable energy sources like solar and wind power. Furthermore, MBIP can lead community engagement by promoting awareness through campaigns and offering rewards for environmentally friendly actions like recycling and waste minimization and encouraging a sense of group accountability for living a low-carbon lifestyle. Iskandar Puteri, under the direction of MBIP, can become a major player in accomplishing national low carbon targets and significantly reducing the effects of climate change on a global scale by implementing these measures into city planning and governance.

Feasibility study (economical):

Discount	*10%*
sens.Cost	*110%*
sens.Benefit	*90%*
annual cost	*7%*
annual benefit	*5%*

Estimated Benefits in RM		
energy saving (carbon reduction)	***3,780***	***Per week***

-	***Estimated Costs in RM***		
Cost	***Hardware***	***60,000***	
	Software	***15,000***	
	marketing and launch	***12,000***	
	legal and compliance	***4,000***	
	materials	***11,000***	***per year***
	labor	***20,000***	***per year***
	manufacturing	***17,000***	***per year***

Costs	Year 0	Year 1	Year 2	Year 3
Development Cost:				
-Hardware	66000			
-Software	16500			
-marketing and launch	13200			
-legal and compliance	4400			
Total	**100100**			
Production Cost:				
-materials		12,100	12947	13853.29
-labor		22,000	23540	25187.8
-manufacturing		18,700	20009	21409.63
Annual Production Cost:				
-		**52,800**	**56,496**	**60,451**
(Present Value)		**48000**	**46690.90909**	**45417.52066**
Accumulated Cost		**148100**	**194790.9091**	**240208.4298**
Benefits				
energy saving (carbon reduction) Cost		**176904**	**185749.2**	**195036.66**

(Present Value)		**160821.8182**	**153511.7355**	**146533.9294**
Accumulated benefits (Present Value)		**160821.8182**	**314333.5537**	**460867.4831**
Gain or Loss		**12721.81818**	**119542.6446**	**220659.0533**
Profitability Index	**2.204386147**			

probability index is 2.204386147 , which is a good investment ; the index is more than 1.

5.0 objectives

By laying out your goals in detail, the objectives section provides context for the economic feasibility analysis.

1. To evaluate the Low Carbon Data Collection and Analysis Platform's financial feasibility for the MBIP.

2. Calculate and evaluate the project's estimated benefits to MBIP, both material and immaterial.

3. Assessing the monetary expenses linked to the creation and functioning of the novel system.

4. Accounting for the time value of money, ascertain the present value (PV) of future expenditures and benefits.

6.0 scope

The study's scope on Low Carbon Initiatives Community Monitoring System in Malaysia includes a thorough examination of national and local environmental policies and initiatives currently in place. It entails analyzing how energy production, transportation networks, and industrial operations affect carbon emissions. The goal of the study is to identify the main challenges to and opportunities presented by reaching low carbon targets while taking socio-economic and technological advancements into account. The scope also includes evaluating the viability of switching to renewable energy sources and the efficacy of current sustainability practices within industries. The research will yield significant insights into possible approaches that communities, businesses, and policymakers can use to cooperate in the pursuit of a low-carbon and more sustainable future for Malaysia.

7.0 Project Planning

In this project, we will present the project steps and details using a Work Breakdown Structure (WBS). This tool will help break down the project into smaller, more manageable components. Additionally, a Gantt chart will be included in this project to visualize the project plan over time.

7.1 Human Resource

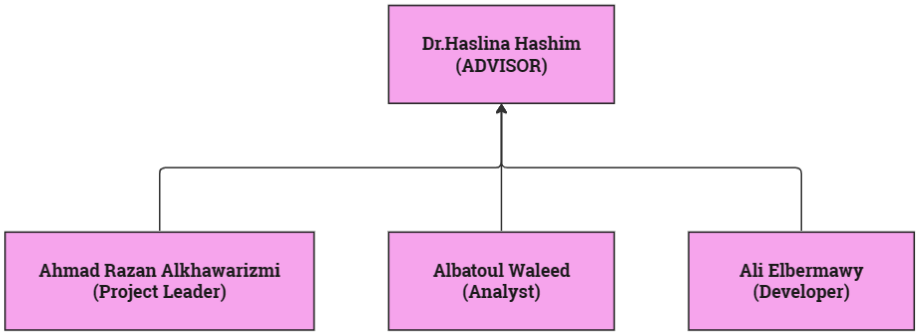


Figure 1

7.2 Work Breakdown Structure

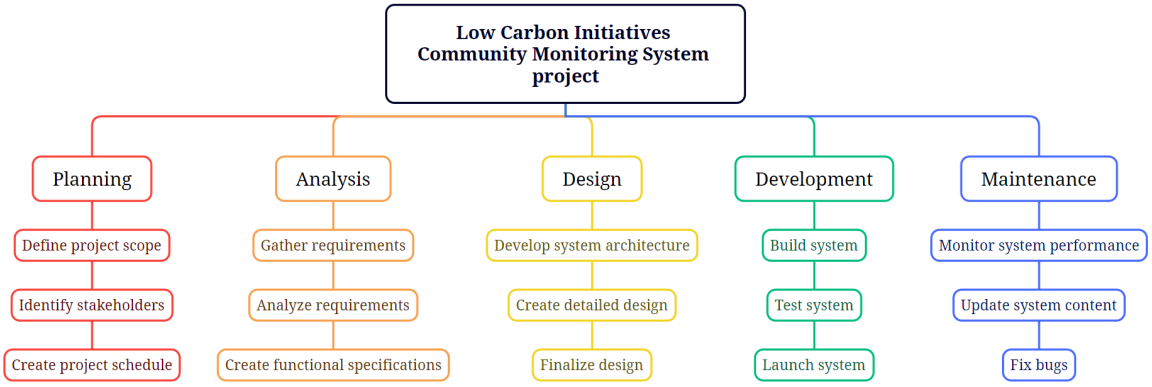


Figure 2, WBS in General

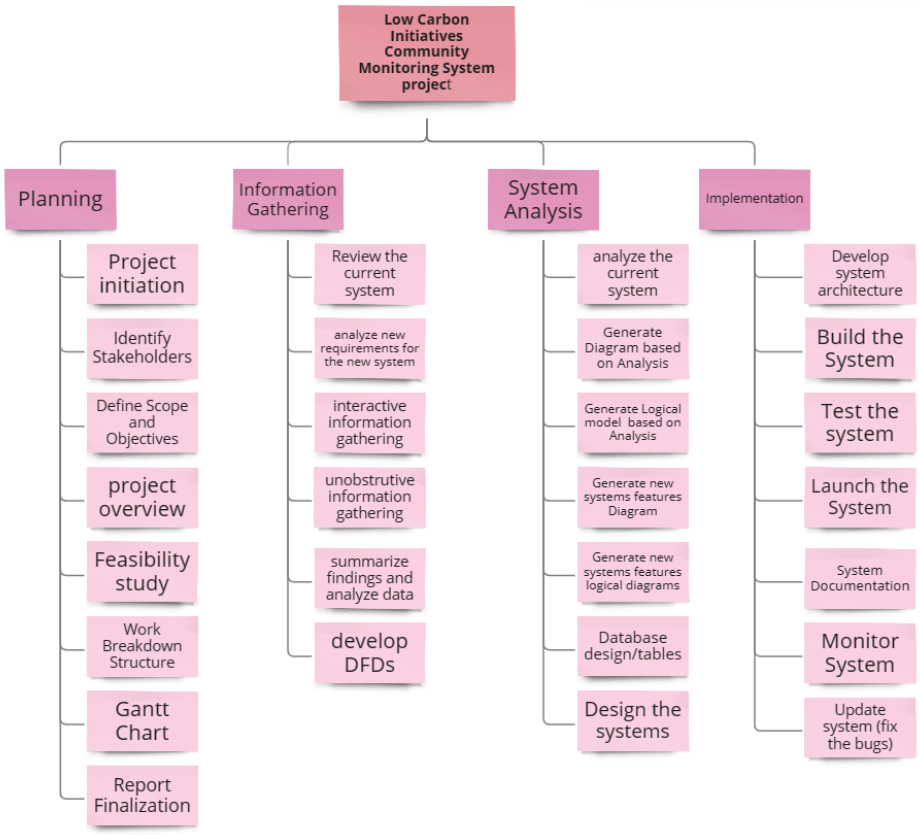


Figure 3, WBS in Specific

7.3 Gantt Chart

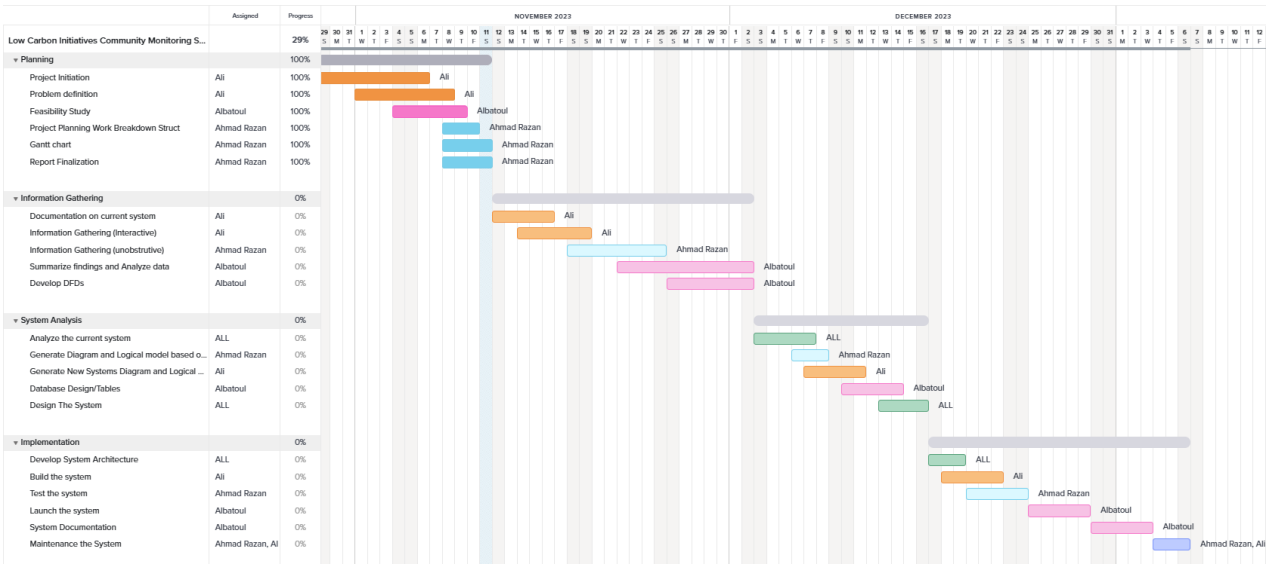


Figure 4

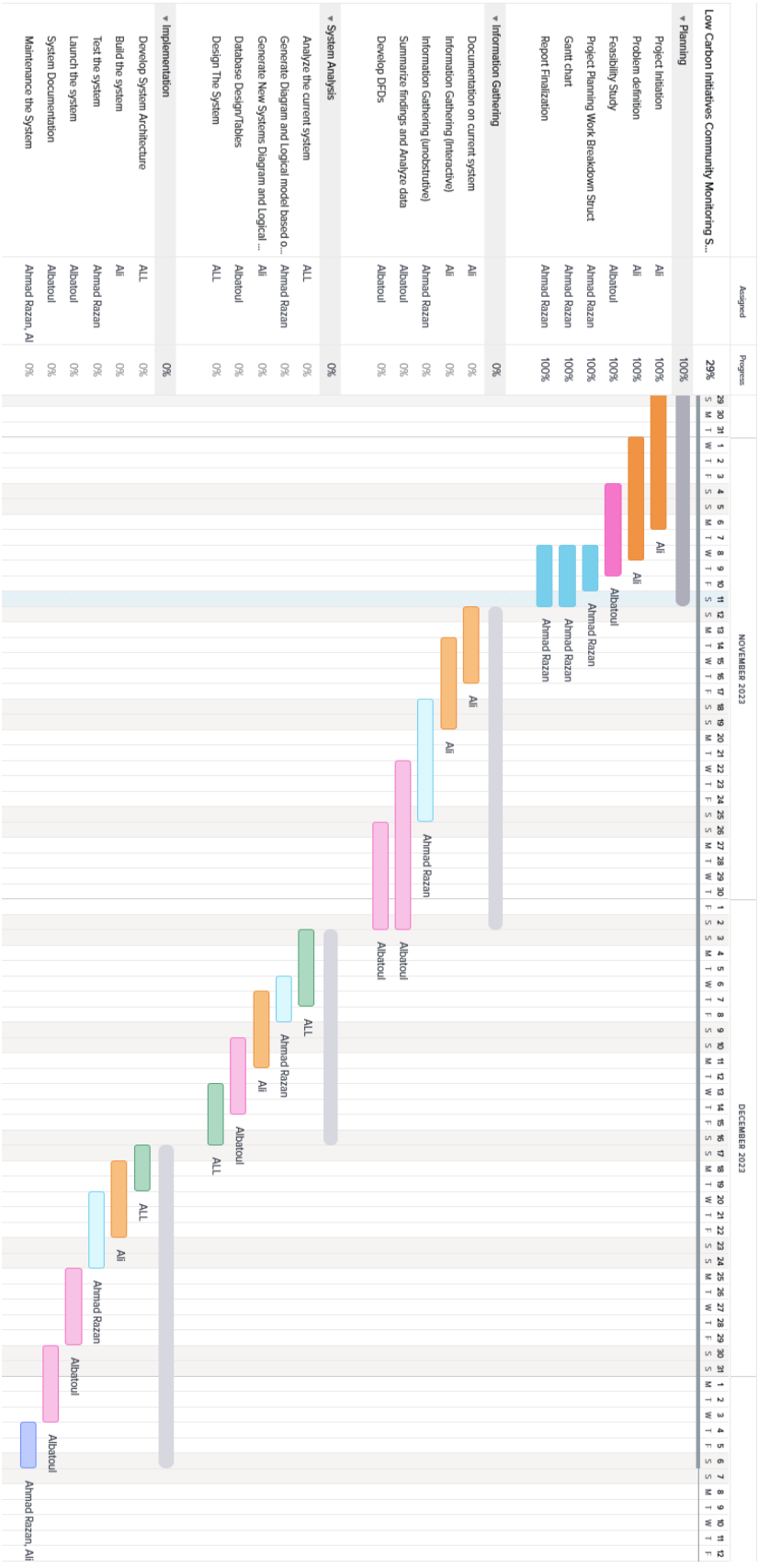


Figure 5, Gantt chart in vertical

8.0 Requirement Analysis (based from AS-IS analysis)

The participant enrolls in the MBIP and enters their relevant data to start the registration process. Then, upon identification of a particular type of data, like electricity consumption, the participant is asked to enter the necessary data. The finished data is then automatically submitted by the system. This process is repeated for different kinds of data. The system starts functions like auto calculation, analysis, color identification, carbon calculation, and mapping of reduction if the entered data is approved.

The participant is prompted to choose a valid data type, in the event of rejection; A declaration form and a survey are sent to the participant for further information ,after all necessary actions have been completed. After obtaining the completed submission, the administrator examines and verifies the information. Once authorized,the admin provides the participants with the receipts ; the participant is given a reminder to keep the receipt , signaling the end of the program.

8.1 Current Business process (Scenarios, Workflow)

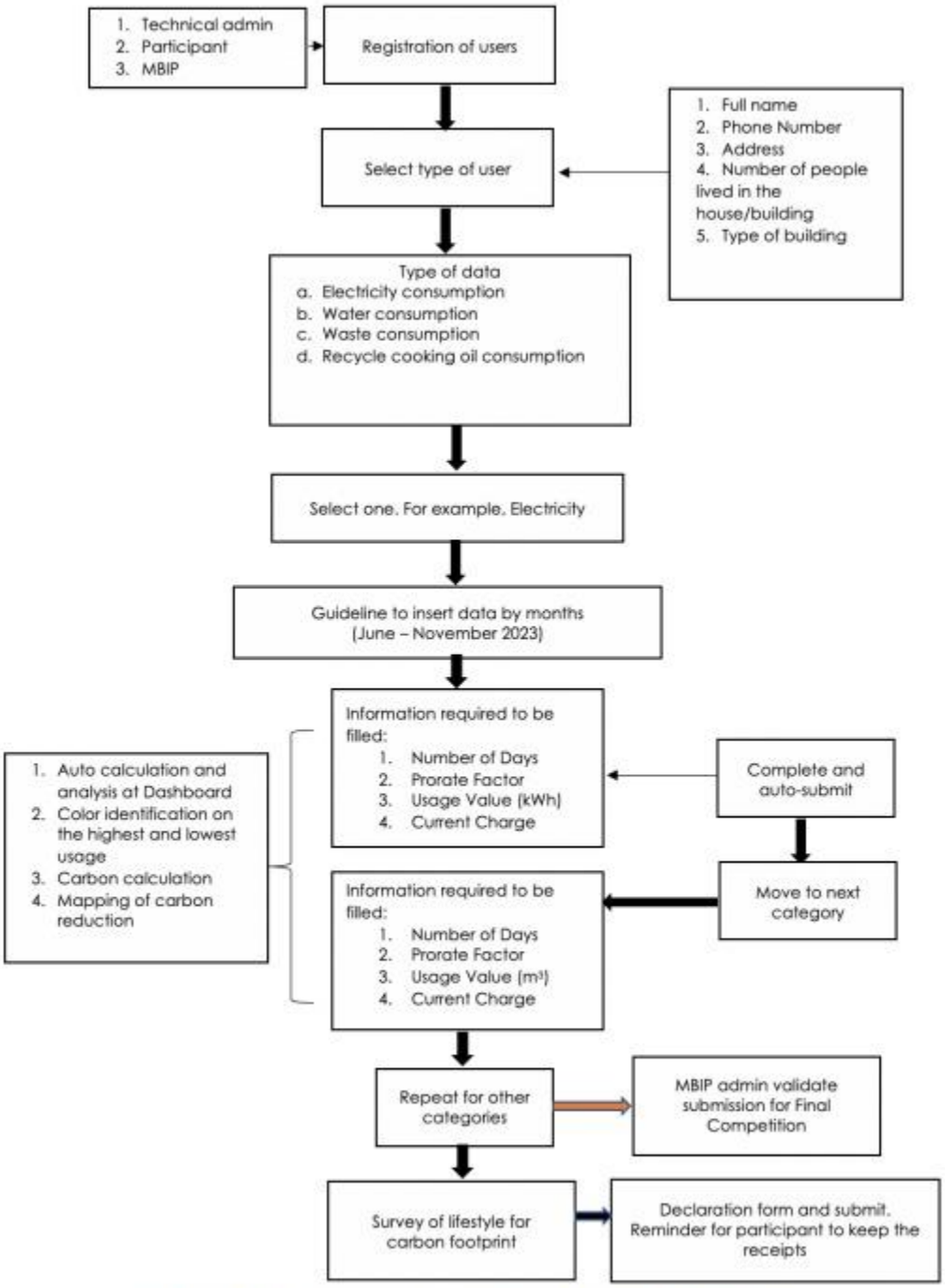
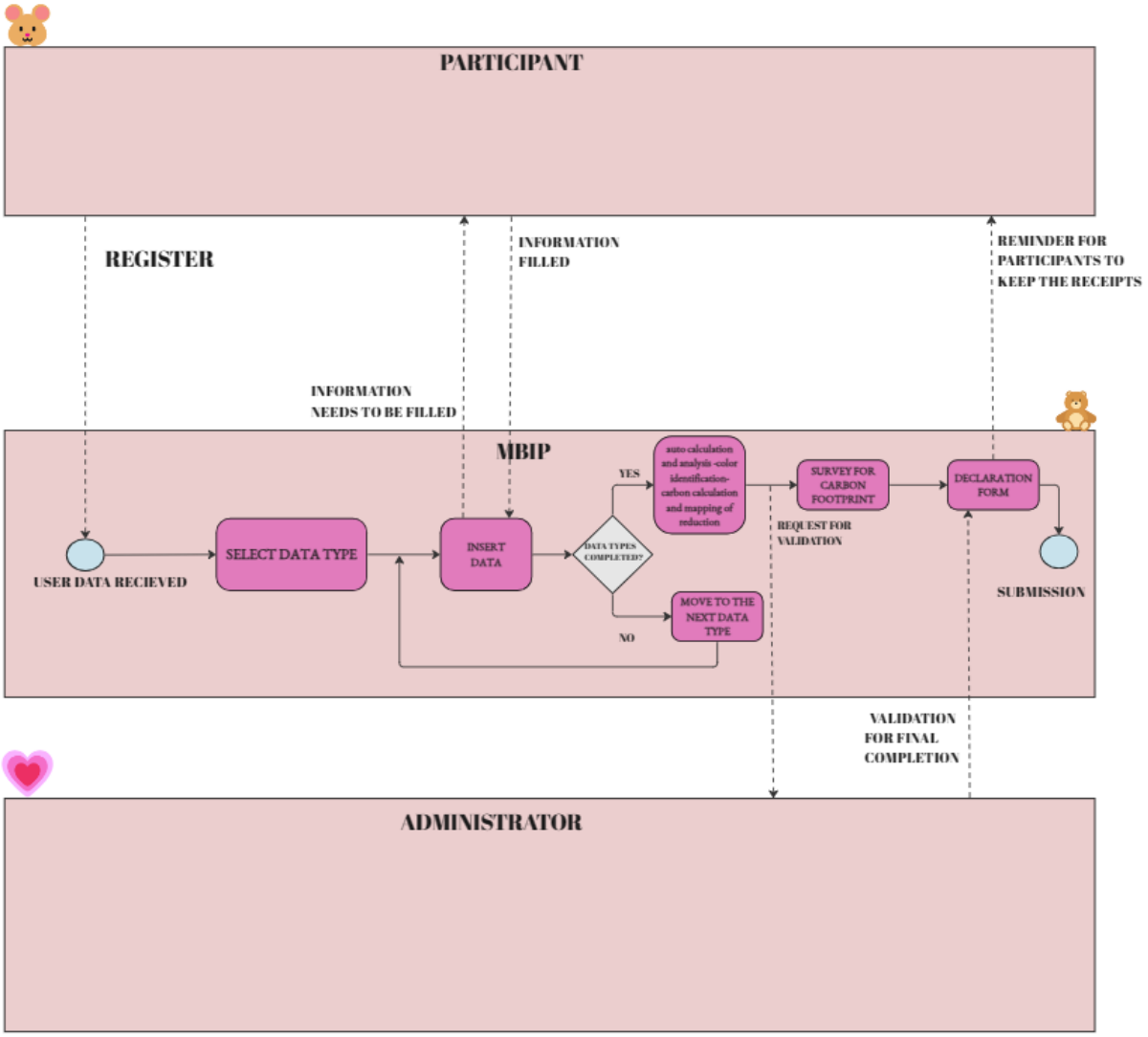


Figure 1: As-Is Process for Low Carbon Emission Calculation


PARTICIPANT
REGISTER
INFORMATION FILLED
REMINDER FOR PARTICIPANTS TO KEEP THE RECEIPTS
INFORMATION NEEDS TO BE FILLED
MBIP
USER DATA RECIEVED
SELECT DATA TYPE
INSERT DATA
DATA TYPES COMPLETED?
YES
NO
auto calculation and analysis -color identification- carbon calculation and mapping of reduction
MOVE TO THE NEXT DATA TYPE
SURVEY FOR CARBON FOOTPRINT
REQUEST FOR VALIDATION
DECLARATION FORM
SUBMISSION
VALIDATION FOR FINAL COMPLETION
ADMINISTRATOR

9.0 Transaction Requirement

Entity	Data	Entry	Update	Delete	Query
Users	-userID -fullName -phoneNumber -address -numberOfPeopleInBuilding -typeOfBuilding	User registration by system admin	Update user details by admin	user deletion by system admin	Query on Electric consumption, Water Consumption, Waste Consumption, Recycle cooking oil Consumption.
Electric Consumption	-numberOfDays -prorateFactorElectric -usageValue (kWh) -currentCharge	Enter electric consumption details by admin	Update electric consumption details by admin	Delete electric consumption details by admin	Query on Electric consumption by User
Water Consumption	-numberOfDays -prorateFactorWater -usageValue (m^3) -currentCharge	Enter water consumption details by admin	Update water consumption details by admin	Delete water consumption details by admin	Query on Water consumption by User
Waste Consumption	-numberOfDays -prorateFactorWaste -usageValue (kg) -currentCharge	Enter Waste consumption details by admin	Update Waste consumption details by admin	Delete Waste consumption details by admin	Query on Waste consumption by User
Recycle cooking oil Consumption	-numberOfDays -prorateFactorCookingOil -usageValue (m^3) -currentCharge	Enter Recycle cooking oil consumption details by admin	Update Recycle cooking oil consumption details by admin	Delete Recycle cooking oil consumption details by admin	Query on Recycle cooking oil consumption by User

10.0 Benefit and Summary of Proposed System

In summary , The Proposed system is a user-oriented design, by which all the properties and features built in were made to solve the users issues. The System combines a bunch of main functionalities following the principles of an easy and efficient system. In this section, we can claim that the designed system is

1. Efficient as in streamlining data entry, reducing the time and effort required from participants. Automation of CO2 consumption calculations and regional reporting will enhance efficiency by eliminating the burden of outdated methods and minimizing the risk of human error.
2. Accurate and Flexible as We have automation of CO2 consumption calculations ensures accuracy in reporting. The system's flexibility lies within the dynamic and fast adjustments, handling continuously changing data and reducing the likelihood of inaccuracies.
3. Data Analysis for Informed Decision-Making; the incorporation of data analysis technology within the system itself provides valuable and quick insights, guiding the stakeholders decisions addressing the critical questions, giving them more context to take better and informed decisions.
4. built in dashboard ; which focuses on long term communication strategy with all users as it provides them with their live consumption indicators keeping them alert and carful to always consume less energy. benign able to self track themselves will help them make sustainable decisions towards their daily consumption. fosters an ongoing engagement with participants and stakeholders.

This overall approach positions the MBIP initiative as a more efficient, accessible, and effective tool for promoting low-carbon behavior within the Iskandar Puteri community.

11.0 Summary

This project proposal collects and analyzes the data to support the Iskandar Puteri City Council's (MBIP) efforts to support a low carbon society. User-friendly data entry process, automating carbon reduction calculations, and providing data analysis capabilities will support MBIP movements. this project using WBS (Work Breakdown Structure) and Gantt chart in order to manage the project in a wider range.This WBS will provide direct plan for solving the big project, which makes it more efficient to handle in general,The WBS for this project will consist of project planning, information gathering, system analysis and implementation.By data collection and analysis platform, the project team is positive can be developed within reasonable budget and timeline.the feature will give MBIP the data or information that will affect their decision for carbon emission reduction goal.

By reflecting on the development of this project proposal, we have learned that any complex project management can be solved by systematic approach (WBS and Gantt chart), since the WBS and Gantt provide will help us to arrange the work timeline. We also realized that this proposal needs team work, especially about the clarity of communication. Also,commitment to learning, collaboration, and contributing to Iskandar Puteri's greener future.

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