UNIVERSITI TEKNOLOGI MALAYSIA
FACULTY OF COMPUTER, UTM JOHOR BAHRU


SEMESTER I, SESSION 2023/2024

# PROJECT PROPOSAL


**SECD2523: Database**


**Section 06**

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# 1.0 INTRODUCTION

This project proposal envisions the creation of a transformative initiative, the Low Carbon Initiatives Community Monitoring System, in response to Malaysia's strong commitment to sustainability, as demonstrated by initiatives such as the Low Carbon Cities Framework (LCCF) and the Johor government's visionary Low Carbon Blueprint for Iskandar Malaysia 2025.

It is essential to regularly monitor and measure carbon dioxide ($CO_2$) emissions in light of the necessity to address climate change and counteract global warming. The Low Carbon Blueprint, which encompasses five local authorities, including the districts of Johor Bahru and Kulai Jaya, sets an admirable goal of reducing carbon intensity by 58 percent by 2025 as compared to the baseline year of 2005.

This proposal addresses the particular difficulties that MBIP's Iskandar Puteri Low Carbon Calendar Competition ran into, including problems with participant engagement, data input, and data analysis capabilities. Similar to the successful e-Lestari system, MBIP plans to create a complete Low Carbon Initiatives Community Monitoring System to solve these issues. Targeting people, institutions, MBIP divisions, and staff are some of the community segments that this innovative platform hopes to reach.

Mapping the carbon footprint within the MBIP region, calculating carbon reductions across multiple dimensions (electricity, water, waste, and recycled cooking oil consumption), identifying high-emission communities, and developing a self-monitoring dashboard for users are just a few of the ambitious and significant goals of the proposed system. The platform will be made to function in Bahasa Melayu, guaranteeing inclusion and accessibility.

# 2.0 BACKGROUND STUDY

Malaysia has emerged as a central hub for sustainability programs that tackle the complex problems of environmental, social, and economic aspects in recent times. One notable attempt in this context is the execution of the Low Carbon Cities Framework (LCCF), which aims to direct and assist Malaysian cities in embracing low-carbon development plans. Given the urgency of addressing climate change and halting global warming, one of the most important aspects of these efforts is the ongoing measurement and evaluation of carbon dioxide ($CO_2$) emissions, which provides a baseline for reduction efforts.

Within the broader Malaysian context, the state of Johor has embarked on its own ambitious plan to foster a low-carbon society, encapsulated in the comprehensive Low Carbon Blueprint for Iskandar Malaysia 2025. This blueprint outlines a robust set of 281 strategic policies, targeting a substantial 58 percent reduction in carbon intensity by 2025 compared to the 2005 baseline. Encompassing five local authorities, including the entire Johor Bahru and Kulai Jaya districts, this initiative demonstrates a regional commitment to sustainable development [2].

To actualize the objectives delineated in the blueprint, various government agencies have implemented specific initiatives tailored to their user bases. These include the Iskandar Malaysia Ecolife Challenge (IMELC) program, the Johor Education Department's (JPNJ) e-Lestari system, and the Iskandar Puteri City Council's (MBIP) Iskandar Puteri Low Carbon (IPRK) initiative. Although these initiatives share the common goal of increasing awareness about the significance of low carbon emissions, their functionalities vary based on the unique user groups they cater to.

The IMELC program, targeting students, teachers, and families in Iskandar Malaysia, seeks to enhance awareness of the Low Carbon Society (LCS) with a primary goal of achieving the carbon reduction target by 2025. Simultaneously, the e-Lestari initiative, introduced specifically for JPNJ, focuses on integrating sustainability elements into the education system. This initiative aims to enhance sustainability education, manage and evaluate integrated sustainability programs, raise awareness, build capacity, and conduct energy audits across 1180 schools. Notably, the JPNJ officers have acknowledged the system's positive impact on reporting annual performance related to environmental and sustainability education.

As a key stakeholder in promoting the Low Carbon Society, MBIP initiated the Iskandar Puteri Low Carbon (IPRK) initiative. This initiative aspires to gather comprehensive data on energy-saving efforts within the community, extending its reach to schools, residential areas, higher education institutions, factories, and more. Despite launching the Iskandar Puteri Low Carbon Calendar Competition in 2019, aiming to incentivize the community to reduce electricity and energy consumption and manage waste, the initiative faced significant challenges. These included a time-consuming and user-unfriendly data entry process,

extensive participant information requirements, manual carbon reduction calculations and reporting, a lack of data analysis capabilities, varied user profiles, and participants' unfamiliarity with the Google Form. In response, MBIP set up kiosks to facilitate form completion within the community.

In light of these challenges, MBIP now envisions the development of a comprehensive data collection and analysis platform, drawing inspiration from the successful e-Lestari system. This new platform will be designed to target diverse community categories, including residents in multi-story and landed houses, institutions, MBIP divisions, and MBIP staff. The anticipated data and analysis requirements for MBIP span mapping the carbon footprint within the MBIP region, calculating carbon reductions for electricity, water, waste, and recycled cooking oil consumption, identifying communities with high $CO_2$ emissions, and creating a self-monitoring dashboard for carbon emissions among users. Crucially, this platform will operate in Bahasa Melayu to ensure accessibility and relevance to the local population.

In conclusion, the proposed Low Carbon Initiatives Community Monitoring System project emerges as a crucial response to the evolving sustainability landscape in Malaysia, with a particular focus on the Iskandar Puteri region. By addressing the challenges faced by MBIP and leveraging the success of existing initiatives, the project aims to enhance the effectiveness of low-carbon initiatives, promote community engagement, and contribute meaningfully to the broader objectives of achieving a low-carbon society. Figure 1 provides an insightful illustration of the current process, emphasizing the identified challenges, while Figure 2 offers a tangible example in the form of a customer bill statement, showcasing the potential impact of low carbon emission calculations.

# 3.0 PROBLEM STATEMENT

The current state of sustainability initiatives in Iskandar Malaysia, as outlined in the case study, reflects a commendable commitment to low-carbon development. However, several challenges hinder the effective implementation and evaluation of these initiatives, necessitating the development of a Low Carbon Initiatives Community Monitoring System.

## 1. Data Fragmentation and Accessibility

The existing Low Carbon initiatives, including the IMELC program, JPNJ's e-Lestari system, and MBIP's IPRK initiative, operate independently, leading to fragmented data. This fragmentation poses challenges in assessing overall district performance and understanding the collective impact of various initiatives.

## 2. User Engagement and Experience

The Iskandar Puteri Low Carbon Calendar Competition faced issues related to a cumbersome data entry process, extensive participant information requirements, and unfamiliarity with online forms. These challenges resulted in reduced community engagement and hindered the accuracy and efficiency of data collection.

## 3. Lack of Data Analysis Capabilities

The absence of robust data analysis capabilities within existing initiatives, particularly evident in the IPRK initiative, hampers the ability to derive meaningful insights from the collected data. Manual carbon reduction calculations and reporting processes are time-consuming and prone to errors.

## 4. Varied User Profiles

The diverse user groups involved in different initiatives, ranging from students and teachers to residents and institutions, introduce variations in user profiles. A standardized system accommodating these diverse profiles is essential for seamless data collection and analysis.

## 5. Language Barrier

The prevalent use of English in existing systems may create a language barrier for users, particularly in communities where Bahasa Melayu is the primary language. A new platform designed in Bahasa Melayu is crucial for effective communication and user understanding.

## 6. Inefficient Community Data Mapping

Mapping the carbon footprint within the MBIP region requires a more efficient and comprehensive approach. The current process lacks the capability to identify communities with high $CO_2$ emissions, hindering targeted interventions.

## 7. Limited Community Involvement

Despite offering incentives like the Iskandar Puteri Low Carbon Calendar Competition, the community involvement remains suboptimal due to logistical challenges and user-unfriendly interfaces. An improved platform should encourage active participation and promote a sense of collective responsibility.

# 4.0 PROPOSED SOLUTIONS (INCLUDE FEASIBILITY STUDY)

To address the identified challenges and enhance the effectiveness of low-carbon initiatives in Iskandar Malaysia, the proposed solution is the development of a comprehensive Low Carbon Initiatives Community Monitoring System. This solution aims to integrate, streamline, and optimize existing initiatives while introducing features to overcome current limitations. The proposed solution includes:

## 1. Unified Data Integration

Integrate data from the IMELC program, JPNJ's e-Lestari system, and MBIP's IPRK initiative into a centralized database. This integration ensures a holistic view of district performance, promoting a more comprehensive understanding of the impact of various initiatives.

## 2. User-Friendly Interface and Engagement Features

Develop an intuitive and user-friendly interface for data entry, focusing on simplifying the process for participants. Incorporate gamification elements and incentives to enhance community engagement and encourage active participation.

## 3. Robust Data Analysis Module

Implement a powerful data analysis module capable of automating carbon reduction calculations and generating insightful reports. This feature will reduce manual efforts, enhance accuracy, and facilitate data-driven decision-making for sustainability programs.

## 4. Adaptive User Profiles

Design the system to accommodate diverse user profiles, ensuring that the platform is accessible and tailored to the specific needs of students, teachers, residents, institutions, and MBIP staff. Customizable user interfaces will enhance user experience.

## 5. Multilingual Support

Recognizing the importance of language accessibility, the platform will be developed in Bahasa Melayu, breaking down language barriers and ensuring that information is easily understood and accessible to all community members.

## 6. Efficient Community Data Mapping

Implement an advanced mapping feature to identify communities with high $CO_2$ emissions accurately. This will enable targeted interventions, allowing for more efficient allocation of resources and focused sustainability initiatives.

## 7. Enhanced Incentive Programs

Revise incentive programs, learning from the challenges faced by the Iskandar Puteri Low Carbon Calendar Competition. Introduce seamless online participation, reduce information requirements, and leverage technology to simplify the competition process, encouraging greater community involvement.

## Feasibility Study

Conducting a feasibility study is crucial to assess the viability and potential success of the proposed system. Key aspects of the feasibility study will include:

- **Technical Feasibility:**
  Evaluate the technical requirements, infrastructure, and capabilities needed for system development and implementation.
- **Operational Feasibility:**
  Assess the practicality of the proposed system in terms of how well it aligns with existing processes, user capabilities, and operational workflows.
- **Financial Feasibility:**
  Estimate the costs associated with system development, deployment, and maintenance, comparing them with potential benefits and returns on investment.
- **Legal and Ethical Considerations:**
  Ensure compliance with data protection and privacy regulations, addressing any legal or ethical concerns associated with data collection and usage.
- **Schedule Feasibility:**
  Develop a realistic timeline for system development, testing, and deployment to ensure timely implementation.

The proposed Low Carbon Initiatives Community Monitoring System, with its integrated features and emphasis on community engagement, is envisioned to catalyze a more sustainable and participatory approach towards achieving the carbon reduction targets outlined in the Iskandar Malaysia 2025 blueprint.

# 5.0 OBJECTIVES

The objective of the proposed Low Carbon Initiatives Community Monitoring System is to establish a comprehensive and user-friendly platform that effectively addresses the challenges faced by the Iskandar Puteri City Council (MBIP) in implementing its Iskandar Puteri Low Carbon (IPRK) initiative. The primary goal is to streamline data collection, analysis, and reporting processes, fostering community engagement and promoting sustainable practices within the Iskandar Puteri region.

# 6.0 SCOPE

## 1. System Development

- Design and develop a comprehensive data collection and analysis platform for monitoring low carbon initiatives within the Iskandar Puteri region.
- Incorporate user-friendly interfaces for various community categories, ensuring accessibility for residents, institutions, MBIP divisions, and staff.
- Implement features to facilitate mapping of the carbon footprint, calculating carbon reductions, and identifying high CO2 emission communities.

## 2. Community Engagement

- Establish channels for effective communication and engagement with community members.
- Develop strategies to encourage participation and awareness regarding low carbon initiatives.
- Conduct training sessions to educate users on the new system and its functionalities.

## 3. Data Collection and Mapping

- Design a robust system capable of collecting and managing data related to electricity, water, waste, and recycled cooking oil consumption.
- Develop mapping capabilities to visualize the carbon footprint within the MBIP region.

## 4. Carbon Reduction Calculation

- Implement algorithms for accurate calculation of carbon reductions associated with various activities, including electricity and energy consumption, waste management, and recycling efforts.

- Ensure transparency in calculations to build trust among users.

## 5. Language Localization

- Develop the platform primarily in Bahasa Melayu to cater to the linguistic preferences of the local community.
- Implement language localization features to accommodate diverse linguistic needs.

## 6. Self-Monitoring Dashboard

- Create an intuitive and user-friendly dashboard for residents, institutions, MBIP divisions, and staff to monitor their own carbon emissions.
- Provide real-time feedback and visualizations to enhance user engagement.

## 7. Integration with Existing Initiatives

- Ensure seamless integration with ongoing initiatives such as IMELC, e-Lestari, and IPRK to leverage existing data and enhance collaboration.
- Collaborate with JPNJ and MBIP to align functionalities with their sustainability goals.

## 8. Data Analysis and Reporting

- Implement robust data analysis capabilities for assessing district performance, electricity and energy savings, and school categorization.
- Generate comprehensive reports on annual performance, environmental impact, and sustainability education.

## 9. User Support and Training

- Provide user support services to address queries and concerns.
- Develop training materials and conduct training sessions for different user groups.

## 10. Security and Privacy Measures

- Implement stringent security measures to protect sensitive data.
- Ensure compliance with privacy regulations and standards to safeguard user information.

## 11. Iterative Development and Feedback Mechanism

- Adopt an iterative development approach to continuously improve the platform based on user feedback and evolving requirements.
- Establish mechanisms for users to provide feedback on system functionalities and performance.

# 7.0 PROJECT PLANNING

# 7.1 Human Resources

- Project Manager:

Responsible for overall project planning, execution, and delivery. They coordinate the efforts of the team, manage timelines, and ensure that the project meets its objectives.

- Developers/Programmers:

Write the code for the software based on the specifications provided. They may specialize in front-end (user interface), back-end (server-side logic), or full-stack development.

i. Database Administrator (DBA):
   Manages and maintains the database(s) used by the application. They ensure data integrity, security, and optimal performance.

ii. UI/UX Designer:
   Designs the user interface and user experience of the software, ensuring that it is visually appealing, intuitive, and user-friendly.
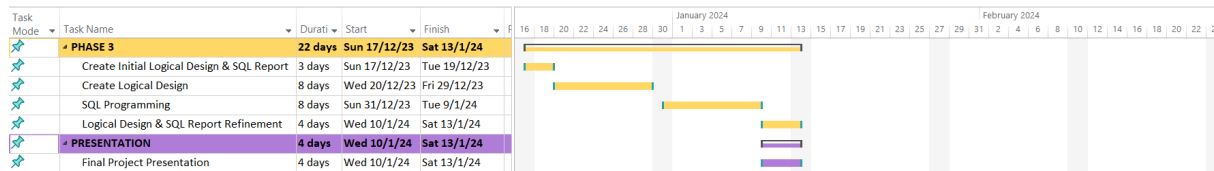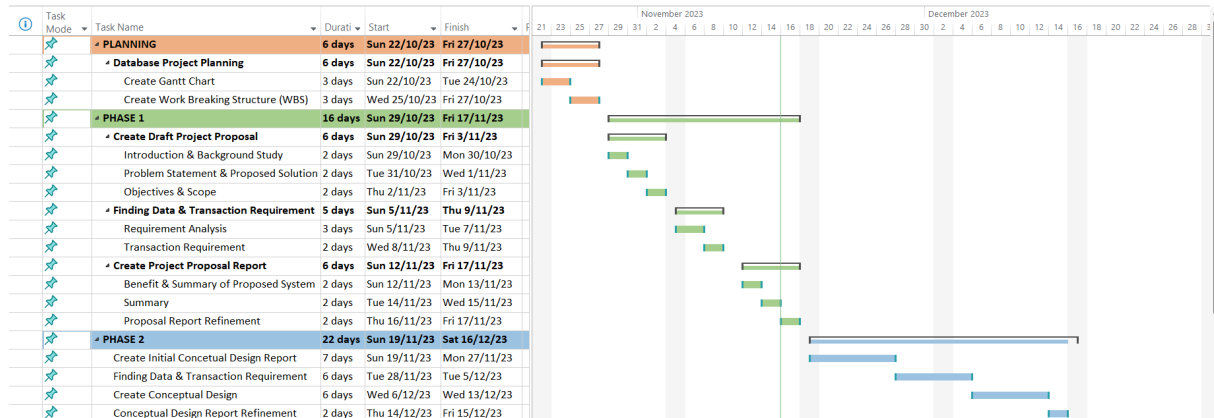
iii. System Analyst:
   Analyzes the information needs of end-users and helps translate these into software requirements. They bridge the communication gap between stakeholders and the development team.

# 7.2 WORK BREAKDOWN STRUCTURE (WBS)

| Task Mode | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 📌 | **⊿ PLANNING** | **6 days** | **Sun 22/10/23** | **Fri 27/10/23** |
| 📌 | **⊿ Database Project Planning** | **6 days** | **Sun 22/10/23** | **Fri 27/10/23** |
| 📌 | Create Gantt Chart | 3 days | Sun 22/10/23 | Tue 24/10/23 |
| 📌 | Create Work Breaking Structure (WBS) | 3 days | Wed 25/10/23 | Fri 27/10/23 |
| 📌 | **⊿ PHASE 1** | **16 days** | **Sun 29/10/23** | **Fri 17/11/23** |
| 📌 | **⊿ Create Draft Project Proposal** | **6 days** | **Sun 29/10/23** | **Fri 3/11/23** |
| 📌 | Introduction & Background Study | 2 days | Sun 29/10/23 | Mon 30/10/23 |
| 📌 | Problem Statement & Proposed Solution | 2 days | Tue 31/10/23 | Wed 1/11/23 |
| 📌 | Objectives & Scope | 2 days | Thu 2/11/23 | Fri 3/11/23 |
| 📌 | **⊿ Finding Data & Transaction Requirement** | **5 days** | **Sun 5/11/23** | **Thu 9/11/23** |
| 📌 | Requirement Analysis | 3 days | Sun 5/11/23 | Tue 7/11/23 |
| 📌 | Transaction Requirement | 2 days | Wed 8/11/23 | Thu 9/11/23 |
| 📌 | **⊿ Create Project Proposal Report** | **6 days** | **Sun 12/11/23** | **Fri 17/11/23** |
| 📌 | Benefit & Summary of Proposed System | 2 days | Sun 12/11/23 | Mon 13/11/23 |
| 📌 | Summary | 2 days | Tue 14/11/23 | Wed 15/11/23 |
| 📌 | Proposal Report Refinement | 2 days | Thu 16/11/23 | Fri 17/11/23 |
| 📌 | **⊿ PHASE 2** | **22 days** | **Sun 19/11/23** | **Sat 16/12/23** |
| 📌 | Create Initial Concetual Design Report | 7 days | Sun 19/11/23 | Mon 27/11/23 |
| 📌 | Finding Data & Transaction Requirement | 6 days | Tue 28/11/23 | Tue 5/12/23 |
| 📌 | Create Conceptual Design | 6 days | Wed 6/12/23 | Wed 13/12/23 |
| 📌 | Conceptual Design Report Refinement | 2 days | Thu 14/12/23 | Fri 15/12/23 |

| Task Mode | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 📌 | **⊿ PHASE 3** | **22 days** | **Sun 17/12/23** | **Sat 13/1/24** |
| 📌 | Create Initial Logical Design & SQL Report | 3 days | Sun 17/12/23 | Tue 19/12/23 |
| 📌 | Create Logical Design | 8 days | Wed 20/12/23 | Fri 29/12/23 |
| 📌 | SQL Programming | 8 days | Sun 31/12/23 | Tue 9/1/24 |
| 📌 | Logical Design & SQL Report Refinement | 4 days | Wed 10/1/24 | Sat 13/1/24 |
| 📌 | **⊿ PRESENTATION** | **4 days** | **Wed 10/1/24** | **Sat 13/1/24** |
| 📌 | Final Project Presentation | 4 days | Wed 10/1/24 | Sat 13/1/24 |

# 7.3 GANTT CHART

| | Task Mode | Task Name | Durati | Start | Finish |
|---|---|---|---|---|---|
| | | ⊿ PLANNING | 6 days | Sun 22/10/23 | Fri 27/10/23 |
| | | ⊿ Database Project Planning | 6 days | Sun 22/10/23 | Fri 27/10/23 |
| | | Create Gantt Chart | 3 days | Sun 22/10/23 | Tue 24/10/23 |
| | | Create Work Breaking Structure (WBS) | 3 days | Wed 25/10/23 | Fri 27/10/23 |
| | | ⊿ PHASE 1 | 16 days | Sun 29/10/23 | Fri 17/11/23 |
| | | ⊿ Create Draft Project Proposal | 6 days | Sun 29/10/23 | Fri 3/11/23 |
| | | Introduction & Background Study | 2 days | Sun 29/10/23 | Mon 30/10/23 |
| | | Problem Statement & Proposed Solution | 2 days | Tue 31/10/23 | Wed 1/11/23 |
| | | Objectives & Scope | 2 days | Thu 2/11/23 | Fri 3/11/23 |
| | | ⊿ Finding Data & Transaction Requirement | 5 days | Sun 5/11/23 | Thu 9/11/23 |
| | | Requirement Analysis | 3 days | Sun 5/11/23 | Tue 7/11/23 |
| | | Transaction Requirement | 2 days | Wed 8/11/23 | Thu 9/11/23 |
| | | ⊿ Create Project Proposal Report | 6 days | Sun 12/11/23 | Fri 17/11/23 |
| | | Benefit & Summary of Proposed System | 2 days | Sun 12/11/23 | Mon 13/11/23 |
| | | Summary | 2 days | Tue 14/11/23 | Wed 15/11/23 |
| | | Proposal Report Refinement | 2 days | Thu 16/11/23 | Fri 17/11/23 |
| | | ⊿ PHASE 2 | 22 days | Sun 19/11/23 | Sat 16/12/23 |
| | | Create Initial Concetual Design Report | 7 days | Sun 19/11/23 | Mon 27/11/23 |
| | | Finding Data & Transaction Requirement | 6 days | Tue 28/11/23 | Tue 5/12/23 |
| | | Create Conceptual Design | 6 days | Wed 6/12/23 | Wed 13/12/23 |
| | | Conceptual Design Report Refinement | 2 days | Thu 14/12/23 | Fri 15/12/23 |

| | Task Mode | Task Name | Durati | Start | Finish |
|---|---|---|---|---|---|
| | | ⊿ PHASE 3 | 22 days | Sun 17/12/23 | Sat 13/1/24 |
| | | Create Initial Logical Design & SQL Report | 3 days | Sun 17/12/23 | Tue 19/12/23 |
| | | Create Logical Design | 8 days | Wed 20/12/23 | Fri 29/12/23 |
| | | SQL Programming | 8 days | Sun 31/12/23 | Tue 9/1/24 |
| | | Logical Design & SQL Report Refinement | 4 days | Wed 10/1/24 | Sat 13/1/24 |
| | | ⊿ PRESENTATION | 4 days | Wed 10/1/24 | Sat 13/1/24 |
| | | Final Project Presentation | 4 days | Wed 10/1/24 | Sat 13/1/24 |

# 8.0 REQUIREMENT ANALYSIS (BASED FROM AS-IS ANALYSIS)

Functional requirements:

- The system shall allow users to register themselves and provide their basic information, such as full name, phone number, address, number of people living in the house/building, and type of building.
- The system shall allow users to select the type of data they want to enter, such as electricity consumption, water consumption, waste consumption, or recycle cooking oil consumption.
- The system shall provide guidelines on how to insert data by months (June-November 2023).
- The system shall automatically calculate and analyze the data at the dashboard.
- The system shall identify the highest and lowest usage in color.
- The system shall calculate the carbon footprint.
- The system shall map the carbon reduction to the next category.
- The system shall allow MBIP admin to validate the submissions for the Final Competition.

Non-functional requirements:

- The system shall be easy to use and navigate.
- The system shall be secure and protect user data.
- The system shall be available 24/7.
- The system shall be scalable to accommodate numerous users.

Additional requirements:

- The system shall provide a survey of lifestyle for carbon footprint.
- The system shall provide a declaration form for participants to submit.
- The system shall send a reminder to participants to keep the receipts.

Use cases:

- User registration:

  A user registers themselves and provides their basic information.

- Data entry:

  A user selects the type of data they want to enter and provides the required information.

- Calculation and analysis:

  The system automatically calculates and analyzes the data at the dashboard.

- Carbon footprint calculation:

  The system calculates the carbon footprint.

- Carbon reduction mapping:

  The system maps the carbon reduction to the next category.

- Submission validation:

  MBIP admin validates the submissions for the Final Competition.

- Lifestyle survey:

  A user completes the lifestyle survey for carbon footprint.

- Declaration form submission:

  A user submits the declaration form.

# 8.1 CURRENT BUSINESS PROCESS (SCENARIOS, WORKFLOW)

The current business process for the Low Carbon Initiatives Community Monitoring System involves several key scenarios and workflows, as illustrated in Figure 1. The process primarily centers around the initiatives undertaken by Iskandar Malaysia, specifically the Iskandar Malaysia Ecolife Challenge (IMELC) program, the Johor Education Department's (JPNJ) e-Lestari system, and the Iskandar Puteri City Council's (MBIP) Iskandar Puteri Low Carbon (IPRK) initiative.

## Scenario 1: IMELC Program Implementation

1. Initiation:

   - IMELC program is initiated to enhance awareness of the Low Carbon Society (LCS) among students, teachers, and families.
   - Objectives include achieving the carbon reduction target by 2025.

2. Implementation:

   - Awareness campaigns and activities are conducted in schools and communities.
   - Data is collected from participants, including carbon reduction efforts.

3. Data Processing:

   - The collected data is processed to assess the district's performance, electricity and energy savings, and categorize schools as Showcase Schools or Transition Schools.

4. Feedback Mechanism:

   - JPNJ officers provide positive feedback on the system's ability to report annual performance on environmental and sustainability education.

## Scenario 2: e-Lestari System in JPNJ

1. Introduction:

   - e-Lestari system is introduced in 2022 for JPNJ.
   - Focus is on integrating sustainability elements into the curriculum and extracurricular activities.

2. Functions:

   - Manages and evaluates integrated sustainability programs.
   - Raises awareness about sustainability.
   - Conducts energy audits in schools.

3. Data Collection:

   - Data is collected from 1180 schools, capturing information on sustainability activities, energy audits, and overall program effectiveness.

## Scenario 3: MBIP's IPRK Initiative and Calendar Competition

1. IPRK Initiative Launch:

   - MBIP launches the Iskandar Puteri Low Carbon (IPRK) initiative to gather data on energy-saving efforts within the community.

2. Calendar Competition:

   - In 2019, the Iskandar Puteri Low Carbon Calendar Competition is introduced, incentivizing the community to reduce electricity and energy consumption and manage waste.

3. Challenges Identified:

   - Challenges include a time-consuming and user-unfriendly data entry process, extensive participant information requirements, manual carbon reduction calculations, a lack of data analysis capabilities, varied user profiles, and participants' unfamiliarity with the Google Form.

4. Mitigation Measures:

   - MBIP sets up kiosks to facilitate form completion within the community.

## Scenario 4: MBIP's Plans for a New Data Collection and Analysis Platform

1. Proposal for a New Platform:

   - To address challenges, MBIP plans to develop a data collection and analysis platform similar to the e-Lestari system.

2. Targeted Categories:

   - The new platform will target different community categories, including residents in multi-story and landed houses, institutions, MBIP divisions, and MBIP staff.

3. Data and Analysis Requirements:

   - Mapping the carbon footprint within the MBIP region.
   - Calculating carbon reductions for electricity, water, waste, and recycled cooking oil consumption.
   - Identifying communities with high CO2 emissions.
   - Creating a self-monitoring dashboard for carbon emissions among users.

4. Language and Interface:

   - The primary language for the new system will be Bahasa Melayu.

## Current Business Process Overview

[gambar]

In this current business process, the initiatives are diverse, involving educational programs, community competitions, and data collection efforts. The identified challenges underscore the need for a more efficient and user-friendly data collection and analysis platform, as proposed by MBIP.

# 9.0 TRANSACTION REQUIREMENT (DATA ENTRY, DATA UPDATE/DELETE, DATA QUERIES)

## Data Entry:

- Users should be able to add information of the user to the database, such as full name, phone number, address, number of people lived in the house or building and type of building.
- Users can choose type of data such as, electricity consumption, water consumption, water consumption and recycle cooking oil consumption.

## Data Update/Delete:

- Users can update information of the user to the database, such as full name, phone number, address, number of people lived in the house or building and type of building.
- Users also can update type of data such as, electricity consumption, water consumption, water consumption and recycle cooking oil consumption.
- Users can delete information of the user to the database, such as full name, phone number, address, number of people lived in the house or building and type of building.
- Users also can delete type of data such as, electricity consumption, water consumption, water consumption and recycle cooking oil consumption.

## Data Queries:

- Users should be able to conduct basic searches using keywords such as title, genre, director, or actor.
- Advanced search options should include mood, topic, and specific story point filters.
- Users should be able to query their own profiles to view and verify the information stored.
- Administrators, with appropriate privileges, should be able to query user profiles for administrative purposes.

# 10.0 BENEFIT AND SUMMARY OF PROPOSED SYSTEM

a. Enhanced Data Accuracy and Efficiency:
   Automated data collection and calculations reduce manual errors, ensuring accurate reporting of carbon emissions. Streamlined data entry processes eliminate previous challenges, promoting efficiency and user engagement.

b. Comprehensive Carbon Footprint Mapping:
   The platform provides a visual representation of the carbon footprint within the Iskandar Puteri region, aiding in targeted intervention strategies.

c. Precise Consumption Calculations:
   Algorithms accurately calculate carbon reductions for electricity, water, waste, and recycled cooking oil consumption, enabling precise monitoring and analysis.

d. User-Friendly Self-Monitoring Dashboard:
   Intuitive dashboards empower users to monitor their carbon emissions, track progress, and receive real-time feedback, fostering a sense of community involvement.

e. Community Recognition and Incentives:
   A recognition system encourages communities to actively participate in reducing carbon emissions, fostering healthy competition and collaboration. Incentives, such as community awards or acknowledgments, provide tangible rewards for sustainability efforts.

f. Multi-Category User Targeting:
   The platform accommodates various community categories, including residents, institutions, MBIP divisions, and staff, ensuring inclusivity and a holistic approach to carbon reduction.

g. Integration with Existing Initiatives:
   Seamless integration with other sustainability initiatives, such as the Iskandar Malaysia Ecolife Challenge and JPNJ's e-Lestari system, fosters collaboration and maximizes the impact of collective efforts.

h. Automated Reporting and Analysis:
   Automation of reporting processes saves time and resources, while data analysis capabilities provide valuable insights for decision-making and strategy refinement.

Summary of the Proposed System:

The proposed Low Carbon Data Collection and Analysis Platform for Iskandar Puteri City Council represents a significant step forward in the region's commitment to a Low Carbon Society. By addressing the challenges faced in previous initiatives, the platform ensures efficient data collection, accurate reporting, and community engagement. Its user-friendly interface, comprehensive features, and integration with existing programs make it a powerful tool for empowering communities, recognizing achievements, and driving collective efforts toward sustainable development. Through this platform, MBIP aims to catalyze positive change, reduce carbon emissions, and contribute substantially to Malaysia's broader sustainability objectives.

# 11.0 SUMMARY

In response to Malaysia's sustainability initiatives and the Low Carbon Cities Framework (LCCF), the Johor government has devised the Low Carbon Blueprint for Iskandar Malaysia 2025. This plan aims to achieve a 58 percent reduction in carbon intensity by 2025 through 281 strategic policies. Various government agencies, including the Iskandar Malaysia Ecolife Challenge (IMELC) program, the Johor Education Department's (JPNJ) e-Lestari system, and the Iskandar Puteri City Council (MBIP), are actively involved in promoting low carbon emissions with distinct functionalities.

The IMELC program targets students, teachers, and families to raise awareness of the Low Carbon Society (LCS), with the goal of achieving the carbon reduction target by 2025. The e-Lestari system, introduced for the JPNJ, focuses on integrating sustainability elements into education, conducting energy audits, and managing sustainability programs. Positive feedback has been received on its ability to report annual performance on environmental and sustainability education.

MBIP, a key stakeholder, launched the Iskandar Puteri Low Carbon (IPRK) initiative, including the Iskandar Puteri Low Carbon Calendar Competition. Despite offering incentives for reducing electricity and energy consumption, the competition faced challenges such as a time-consuming data entry process, participant information requirements, manual calculations, and a lack of data analysis capabilities. To overcome these challenges, MBIP plans to develop a data collection and analysis platform similar to the e-Lestari system, targeting different community categories and addressing issues like mapping carbon footprints, calculating reductions, and creating a self-monitoring dashboard. The primary language for this new system will be Bahasa Melayu. Figure 1 illustrates the current process, and Figure 2 provides an example of a customer bill statement with low carbon emission calculations.