**AI Project Logbook**

**PROJECT NAME:** Waste Management AI System

**SCHOOL NAME:** The Millennium School

**YEAR/CLASS:** 2024 – Grade XII

**TEAM MEMBER NAMES AND GRADES:**

1. Gurkirat Singh
2. Tanveer Singh

# 

# 1. Introduction

This document is your **Project Logbook**, and it will be where you record your ideas, thoughts and answers as you work to solve a local problem using AI.

Make a copy of the document in your shared drive and work through it digitally with your team. You can also print a copy of the document and submit a scanned copy once you have completed the Project Logbook. Feel free to add pages and any other supporting material to this document.

Refer to the **AI****Project Guide** for more details about what to do at each step of your project.

# 2. Team Roles

**2.1 Who is in your team and what are their roles?**

|  |  |  |
| --- | --- | --- |
| Role | Role description | Team Member Name |
| Moderator | Handling the website and moderating it as well as organizing and leading the smooth working of the project | Tanveer Singh |
|  |  | Gurkirat Singh |
|  |  |  |
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|  |  |  |

**2.2 Project plan**

The following table is a guide for your project plan. You may use this or create your own version using a spreadsheet which you can paste into this section. You can expand the ‘Notes’ section to add reminders, things that you need to follow up on, problems that need to be fixed urgently, etc.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Phase** | **Task** | **Planned start date** | **Planned end date** | **Planned duration (hours, minutes)** | **Actual start date** | **Actual end date** | **Actual duration (hours, minutes)** | **Who is responsible** | **Notes/Remarks** |
| **Preparing for the project** | Coursework, readings | **May 20,2024** | **September 24,2024** |  |  |  |  |  |  |
|  | Set up a team folder on a shared drive |  |  |  |  |  |  |  |  |
| **Defining the problem** | Background reading |  |  |  |  |  |  |  |  |
| Research issues in our community |  |  |  |  |  |  |  |  |
| Team meeting to discuss issues and select an issue for the project |  |  |  |  |  |  |  |  |
| Complete section 3 of the Project Logbook |  |  |  |  |  |  |  |  |
| Rate yourselves |  |  |  |  |  |  |  |  |
| **Understanding the users** | Identify users |  |  |  |  |  |  |  |  |
| Meeting with users to observe them |  |  |  |  |  |  |  |  |
| Interview with user (1) |  |  |  |  |  |  |  |  |
| Interview with user (2), etc… |  |  |  |  |  |  |  |  |
| Complete section 4 of the Project Logbook |  |  |  |  |  |  |  |  |
| Rate yourselves |  |  |  |  |  |  |  |  |
| **Brainstorming** | Team meeting to generate ideas for a solution |  |  |  |  |  |  |  |  |
| Complete section 5 of the Project Logbook |  |  |  |  |  |  |  |  |
| Rate yourselves |  |  |  |  |  |  |  |  |
| **Designing your solution** | Team meeting to design the solution |  |  |  |  |  |  |  |  |
| Complete section 6 of the logbook |  |  |  |  |  |  |  |  |
| Rate yourselves |  |  |  |  |  |  |  |  |
| **Collecting and preparing data** | Team meeting to discuss data requirements |  |  |  |  |  |  |  |  |
| **Collecting and preparing data**  **Prototyping** | Data collection |  |  |  |  |  |  |  |  |
| Data preparation and labelling |  |  |  |  |  |  |  |  |
| Complete Section 6 of the Project Logbook |  |  |  |  |  |  |  |  |
| Team meeting to plan prototyping phase |  |  |  |  |  |  |  |  |
| **Prototyping**  **Testing** | Train your model with input dataset |  |  |  |  |  |  |  |  |
| Test your model and keep training with more data until you think your model is accurate |  |  |  |  |  |  |  |  |
| Write a program to initiate actions based on the result of your model |  |  |  |  |  |  |  |  |
| Complete section 8 of the Project Logbook |  |  |  |  |  |  |  |  |
| Rate yourselves |  |  |  |  |  |  |  |  |
| Team meeting to discuss testing plan |  |  |  |  |  |  |  |  |
| **Testing**  **Creating the video** | Invite users to test your prototype |  |  |  |  |  |  |  |  |
| Conduct testing with users |  |  |  |  |  |  |  |  |
| Complete section 9 of the Project Logbook |  |  |  |  |  |  |  |  |
| Rate yourselves |  |  |  |  |  |  |  |  |
| Team meeting to discuss video creation |  |  |  |  |  |  |  |  |
|  | Write your script |  |  |  |  |  |  |  |  |
|  | Film your video |  |  |  |  |  |  |  |  |
|  | Edit your video |  |  |  |  |  |  |  |  |
| **Completing the logbook** | Reflect on the project with your team |  |  |  |  |  |  |  |  |
|  | Complete sections 10 and 11 of the Project Logbook |  |  |  |  |  |  |  |  |
|  | Review your Project logbook and video |  |  |  |  |  |  |  |  |
| **Submission** | Submit your entries on the IBM |  |  |  |  |  |  |  |  |

**2.3 Communications plan**

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| --- |
| Will you meet face-to-face, online or a mixture of each to communicate?  We would be willing to meet online and offline both. However, will acknowledge the  request for an online meeting to be more preferable.  How often will you come together to share your progress?  We can come whenever required to share our progress , there is not any particular constraint. Although , we generally meet twice in a week which can extend to thrice or  more if required.  Who will set up online documents and ensure that everyone is contributing?  I, Tanveer Singh , will set up online documents to ensure that contribution is being carry forward mutually and on time.  What tools will you use for communication?  We can have a meeting on Zoom or Google Meet. Though , virtual meeting on Zoom  Would be a better fit for us to present our project. |
|  |

**2.4 Team meeting minutes (create one for each meeting held)**

|  |
| --- |
| Date of meeting:  Who attended:  Who wasn’t able to attend:  Purpose of meeting:  Items discussed:  1.  2.  3.  Things to do (what, by whom, by when)  1.  2.  3. |

# 3. Problem Definition

**3.1 List important local issues faced by your school or community**

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| --- |
| There are many issues which our school or community faced on a regular bases. From ranging to pollution to water problem, to societal issues to management problem , we encounter tons of problem. |

**3.2 Which issues matter to you and why?**

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| --- |
| The concern regarding environment and nature matters to us the most. We believe that saving nature is purely our responsibility, we cannot control nature factors influencing it but even taking stern measures against external factors can lead to a huge impact. Without nature , existence of Earth will become a past memory even humanity and humans would not exist without it , therefore, to save us or the whole world we should save environment, that’s why it matter us the most. |

**3.3 Which issue will you focus on?**

|  |
| --- |
| Here , we would focus on one of the prime problem of community that is waste disposal system. Due to the lack of environment literacy , world has faced surge of problems from the past few decades with the increase of technology. For that reason , we will try to mitigate its effect from whatever way possible, using our knowledge and practical experience and thinking to tackle this problem. |

**3.4 Write your team’s problem statement in the format below.**

|  |
| --- |
| How can we help our community to find a way to safely manage the waste so that they can join hands with the globe in saving flora-fauna and themselves. |

**Rate yourself**

3

**Problem Definition**

1 point - A local problem is described

2 points - A local problem which has not been fully solved before is described.

3 points - A local problem which has not been fully solved before is explained in detail with supporting research.

# 4. The Users

**4.1 Who are the users and how are they affected by the problem?**

|  |
| --- |
| The users are all the world population who are suffering from the effective management of the waste and know how much it will harm to the environment but the educational gap acts as a hindrance to their way. |

**4.2 What have you actually observed about the users and how the problem affects them?**

|  |
| --- |
| Contacting people every day knowing what problems they encountered in their day to day life so that I can help them in that and the problem that is on hot topic is of how to manage their waste which not only affect the environment but also the surroundings in which they live leading to harmful toxins and becoming home to harmful diseases. |

**4.3 Record your interview questions here as well as responses from users.**

|  |
| --- |
| 1. **Question**: How do you currently manage the waste generated in your household, and what challenges do you face in doing so?   "I usually separate my garbage into general waste and recyclables, but I’m often unsure about what can and cannot be recycled. There’s no clear information available, and sometimes I don't have enough space for multiple bins. Plastic packaging is the hardest to manage, and I don't know what to do with electronic waste either."   1. **Question**: Are you aware of the environmental harm caused by improper waste disposal, such as land pollution and the release of toxins?   "Yes, I know it’s harmful, especially plastic waste. It takes years to decompose, and burning it releases toxic fumes. But sometimes, it's hard to avoid using plastic, and I'm not sure about the alternatives. I've also heard that improper disposal of organic waste can cause methane emissions, but we lack proper guidance."   1. **Question**: What types of waste do you struggle with the most in terms of disposal? For example, is it plastic, organic waste, or hazardous materials like electronics?   "I mostly struggle with electronic waste. I have old phones, chargers, and batteries lying around, and I don’t know where to dispose of them. I’ve heard there are special places, but they’re not accessible. Organic waste is also difficult to manage because it starts smelling quickly, and there are no proper composting facilities nearby."   1. **Question**: Do you think there is an educational gap when it comes to waste management in your community? If so, how do you think it affects proper waste handling?   "Definitely! Many people in my community don't know how to manage waste properly. They just throw everything together because they haven’t been taught about sorting or recycling. This gap leads to a lot of waste ending up in landfills when it could be recycled or composted. Educational programs in schools or local communities would be really helpful." |

**4.4 Empathy Map**

Map what the users say, think, do and feel about the problem in this table

|  |  |
| --- | --- |
| **What our users are saying**  Our users are sharing positive feedback about the AI bot’s efficiency in managing waste. Many appreciate how it simplifies sorting and disposal by providing clear instructions, helping them manage their waste responsibly. | **What our users thinking**  Users are recognizing the importance of waste management, with many starting to think more critically about their own waste disposal habits. They also see the AI bot as a useful tool to help them navigate the complexities of recycling and waste categorization. |
| **What our users are doing**  Our users are actively using the AI bot to improve their waste management practices. They're utilizing the system to segregate waste more effectively, ensuring they follow proper disposal methods based on the bot's guidance. | **How our users feel**  Users feel empowered and more informed about their role in reducing environmental impact. They express satisfaction with the bot’s functionality and appreciate how it makes responsible waste management easier and more accessible. |

**4.5 What are the usual steps that users currently take related to the problem and where are the difficulties?**

|  |
| --- |
| 1. Collecting Waste 2. Sorting Waste 3. Disposal 4. Occasional Recycling |

**4.6 Write your team’s problem statement in the format below.**

|  |
| --- |
| Local People are experiencing issues with safely managing the waste  because of lack of knowledge and awareness. |

**Rate yourself**

3

**The Users**

1 point - The user group is described but it is unclear how they are affected by the problem.

2 points - Understanding of the user group is evidenced by completion of most of the steps in this section.

3 points - Understanding of the user group is evidenced by completion of most of the steps in this section and thorough investigation

# 5. Brainstorming

**5.1 Ideas**

How might you use the power of AI/machine learning to solve the users’ problem by increasing their knowledge or improving their skills?

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| --- | --- |
| AI Idea #1 | Developing an AI Model offering real-time guidance on waste management and recycling locations. |
| AI Idea #2 | Launching community education programs to raise awareness about waste segregation and recycling practices. |
| AI Idea #3 | Setting up local recycling and composting facilities to make waste disposal more accessible and efficient. |
| AI Idea #4 | Partner with local businesses to reduce plastic use and promote eco-friendly packaging alternatives. |
| AI Idea #5 | Implementing reward systems that incentivize proper waste segregation and responsible disposal. |

**5.2 Priority Grid**

Evaluate your five AI ideas based on value to users and ease of creation and implementation.

Low

High

VALUE TO USERS

|  |  |
| --- | --- |
| **High value to users, easy to create**  Launching community education programs to raise awareness about waste segregation and recycling practices. | High value to users, hard to create  Developing an AI Model offering real-time guidance on waste management and recycling locations. |
| Low value to users, easy to create  Setting up local recycling and composting facilities to make waste disposal more accessible and efficient. | Low value to users, hard to create  Partner with local businesses to reduce plastic use and promote eco-friendly packaging alternatives. |

Hard

Easy

EASE OF DEVELOPMENT

**5.3 Based on the priority grid, which AI solution is the best fit for your users and for your team to create and implement?**

Briefly summarize the idea for your solution in a few sentences and be sure to identify the tool that you will use.

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|  |

**Rate yourself**

**Brainstorming**

1 point – A brainstorming session was conducted. A solution was selected.

2 points - A brainstorming session was conducted using creative and critical thinking. A solution was selected with supporting arguments in this section

3 points - A brainstorming session was conducted using creative and critical thinking. A compelling solution was selected with supporting arguments in this section.

# 6. Design

* 1. **What are the steps that users will now do using your AI solution to address the problem?**

|  |
| --- |
| 1.  2.  3.  4.  5.  6.  7.  8.  9.  10. |

**Rate yourself**

**Design**

1 point – The use of AI is a good fit for the solution.

2 points - The use of AI is a good fit for the solution and there is some documentation about how it meets the needs of users

3 points - The use of AI is a good fit for the solution. The new user experience is clearly documented showing how users will be better served than they are today.

# 7. Data

**7.1 What data will you need to train your AI solution?**

|  |
| --- |
|  |

**7.2 Where or how will you source your data?**

| **Data needed** | **Where will the data come from?** | **Who owns the data?** | **Do you have permission to use the data?** | **Ethical considerations** |
| --- | --- | --- | --- | --- |
| **Have** |  |  |  |  |
| **Want/Need** |  |  |  |  |
| **Nice to have** |  |  |  |  |

**Rate yourself**

**Data**

1 point – Relevant data to train the AI model have been identified as well as how the data will be sourced or collected.

2 points - Relevant data to train the AI model have been identified as well as how the data will be sourced or collected. There is evidence that the dataset is balanced.

3 points - Relevant data to train the AI model have been identified as well as how the data will be sourced or collected. There is evidence that the dataset is balanced, and that safety and privacy have been considered.

# 8. Prototype

**8.1 Which AI tool(s) will you use to build your prototype?**

|  |
| --- |
|  |

**8.2 Which AI tool(s) will you use to build your solution?**

|  |
| --- |
|  |

**8.3 What decisions or outputs will your tool generate and what further action needs to be taken after a decision is made?**

|  |
| --- |
|  |

**Rate yourself**

**Prototype**

1 point – A concept for a prototype shows how the AI model will work.

2 points - A prototype for the solution has been created and trained.

3 points - A prototype for the solution has been created and successfully trained to meet users’ requirements.

# 9. Testing

**9.1 Who are the users who tested the prototype?**

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| --- |
|  |

**9.2 List your observations of your users as they tested your solution.**

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| --- |
|  |

**9.3 Complete the user feedback grid**

|  |  |
| --- | --- |
| What works | What needs to change |
| Questions? | Ideas |

**9.4 Refining the prototype: Based on user testing, what needs to be acted on now so that the prototype can be used?**

|  |
| --- |
|  |

**9.5 What improvements can be made later?**

|  |
| --- |
|  |

**Rate yourself**

**Testing**

1 point – A concept for a prototype shows how it will be tested.

2 points - A prototype has been tested with users and improvements have been identified to meet user requirements.

3 points - A prototype has been tested with a fair representation of users and all tasks in this section have been completed.

# 

# 10. Team collaboration

**10.1 How did you actively work with others in your team and with stakeholders?**

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| --- |
| In our team of two, I actively take on the role of managing and organizing the project, focusing on the front-end development. My partner handles the back-end work, including processing the AI model for waste management. We maintain regular communication to ensure seamless collaboration, with my partner providing me with ongoing updates, which helps me integrate the technical progress into the overall project strategy. This way, we both contribute to different aspects while working towards a common goal. |

3

**Rate yourself**

**Team collaboration**

1 point – There is some evidence of team interactions among peers and stakeholders.

2 points - Team collaboration among peers and stakeholders is clearly documented in this section.

3 points - Effective team collaboration and communication among peers and stakeholders is clearly documented in this section.

# 

# 11. Individual learning reflection

**11.1. Team Reflections**

A good way to identify what you have learned is to ask yourself what surprised you during the project. List the things that surprised you and any other thoughts you might have on issues in your local community.

**Team member name:** Tanveer Singh

|  |
| --- |
| I was surprised by how much coordination and organization the project required, especially in aligning the AI model with the front-end interface. Managing the project taught me the importance of regular communication and keeping the user interface intuitive for the end-users. |

**Team member name:** Gurkirat Singh

|  |
| --- |
| The technical challenge was ensuring the AI bot accurately processed diverse waste categories and handled inconsistent data. The complexity of creating an AI model that could adapt to different waste management needs across regions was eye-opening, but it also highlighted the potential of technology in solving real-world problems. Together, we learned that a balance of management and technical development is key to a successful project. |

**Rate yourself**

3

**Individual Learning Reflection**

1 point – Some team members present an account of their learning during the project.

2 points - Each team presents an account of their learning during the project.

3 points - Each team member presents a reflective and insightful account of their learning during the project.

# 12. Video link

**Enter the URL of your team video:**

**Enter the password (if any):**

Appendix

Recommended Assessment Rubric (for Teachers)

LOGBOOK AND VIDEO CONTENT

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Steps** | **3 points** | **2 points** | **1 point** | **Points Given** |
| [Problem definition](#_3_Problem_Definition) | A local problem which has not been fully solved before is explained in detail with supporting research. | A local problem which has not been fully solved before is described. | A local problem is described |  |
| [The Users](#_4_The_Users) | Understanding of the user group is evidenced by completion of all of the steps in *Section 4 The Users* and thorough investigation. | Understanding of the user group is evidenced by completion of most of the steps in *Section 4 The Users*. | The user group is described but it is unclear how they are affected by the problem. |  |
| [Brainstorming](#_6_Brainstorming) | A brainstorming session was conducted using creative and critical thinking. A compelling solution was selected with supporting arguments from *Section 5 Brainstorming.* | A brainstorming session was conducted using creative and critical thinking. A solution was selected with supporting arguments in *Section 5 Brainstorming.* | A brainstorming session was conducted. A solution was selected. |  |
| [Design](#_7_Design) | The use of AI is a good fit for the solution. The new user experience is clearly documented showing how users will be better served than they are today. | The use of AI is a good fit for the solution and there is some documentation about how it meets the needs of users. | The use of AI is a good fit for the solution. |  |
| [Data](#_8_Data) | Relevant data to train the AI model have been identified as well as how the data will be sourced or collected. There is evidence that the dataset is balanced, and that safety and privacy have been considered. | Relevant data to train the AI model have been identified as well as how the data will be sourced or collected. There is evidence that the dataset is balanced. | Relevant data to train the AI model have been identified as well as how the data will be sourced or collected. |  |
| [Prototype](#_9_Prototype) | A prototype for the solution has been created and successfully trained to meet users’ requirements. | A prototype for the solution has been created and trained. | A concept for a prototype shows how the AI model will work |  |
| [Testing](#_10_Testing) | A prototype has been tested with a fair representation of users and all tasks in *Section 9 Testing* have been completed. | A prototype has been tested with users and improvements have been identified to meet user requirements. | A concept for a prototype shows how it will be tested. |  |
| [Team collaboration](#_11._Team_Collaboration) | Effective team collaboration and communication among peers and stakeholders is clearly documented in *Section 10 Team collaboration*. | Team collaboration among peers and stakeholders is clearly documented in *Section 10 Team collaboration*. | There is some evidence of team interactions among peers and stakeholders. |  |
| [Individual learning](#_12_Individual_learning) | Each team member presents a reflective and insightful account of their learning during the project. | Each team presents an account of their learning during the project. | Some team members present an account of their learning during the project. |  |
| Total points | | | |  |

VIDEO PRESENTATION

|  |  |  |
| --- | --- | --- |
| **Criteria** | | **Points Given**  3 – excellent  2 – very good  1 – satisfactory |
| Communication | The video is well-paced and communicated, following a clear and logical sequence. |  |
| Illustrative | Demonstrations and/or visuals are used to illustrate examples, where appropriate. |  |
| Accurate language | The video presents accurate science and technology and uses appropriate language. |  |
| Passion | The video demonstrates passion from team members about their chosen topic/idea. |  |
| Sound and image quality | The video demonstrates good sound and image quality. |  |
| Length | The content is presented in the video within a 3-minute timeframe. |  |
| Total points | |  |