PBL Progress

IF-23-2-16

Generative Prompt Image Classification
on Promptails Website

Project Manager: Agung Riyadi, S.Si. M.Kom
Project Proponent: Agung Riyadi, S.Si. M.Kom
Estimated Project Delivery: 6 months

ARTIFICIAL Intelligence

Kampus Merdeka INDONESIA JAYA

polibatam

PROGRAM STUDI
TEKNIK INFORMATIKA
POLIBATAM

Team Members

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SCOPE

1. Determining Classification Models: Studied several classification models such as Convolutional Neural Network (CNN) and selected the most suitable one to be used in this project. Performed a comparison between models by testing the error at the end of the test.
2. Input: The input to the system is a prompt.
3. Data Augmentation: The data will be enhanced using augmentation techniques such as truncation and prompt correction to increase the diversity of the dataset.
4. Model Training: The classification model will be trained using the training dataset, and parameters will be adjusted to improve accuracy and generalisation.
5. Model Testing: The model will be tested on a separate test dataset to measure the actual performance.
6. Classification Criteria: Appropriate classification criteria will be determined for the generative AI results, such as specific categories or styles.

General Design

Classification of generative AI images can be done in several steps. Firstly, select an appropriate classification model such as CNN, ViT, EfficientNet, or Swin Transformer. Compare several models and choose the best one based on complexity, accuracy, and inference speed. Enter a text prompt as input. Perform data augmentation on the prompts and images to increase the diversity of the dataset. Train the model using the labelled training set and optimise the hyperparameters. Test the model on a separate test set and evaluate accuracy, precision, recall, and F1-score. Classify prompts by category, style, or attributes. Use deep learning frameworks such as TensorFlow or PyTorch, pre-train the model with large datasets, and apply transfer learning to improve model performance. Perform cross-validation to ensure generalisation of the model.
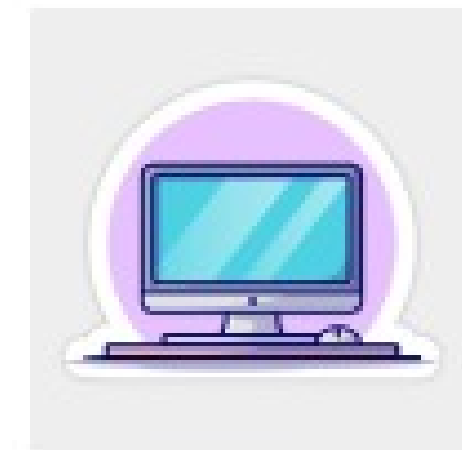
ADMIN

admin runs the system, admin inputs data sheets, and admin classifies each data sheet.
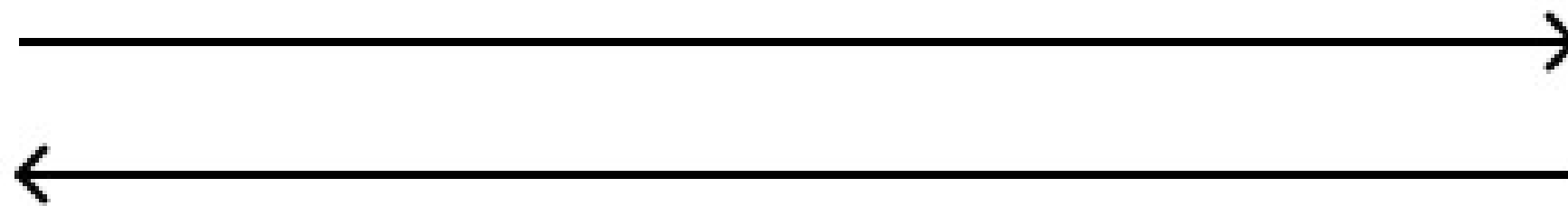
The system displays output for the admin in the form of a data sheet along with the classification of each data in the form of a table

Generative Prompt Image Classification on Promptails Website

System Processing in Realtime

Overview

Methods

Programming Language: Python, Natural Language Toolkit
Features: Predicting class from a prompt & predicting classes from prompts in the dataset

Stages of Labour

1.Preprocessing Data

>Data Collection

>Data Cleaning

>Data Transformation

>Feature Selection

2.Pattern Recognition

>Classification

3.Model Evaluation

>Cross Validation

>Result Interpretation

4.Implementation

>Decision Making

>Model Implementation

Outputs to be Produced

Menu

- ▷ **Training & Testing Model**
- ☰ Classify Prompts
- ⊡ Input a Prompt

dimensional illustration food beverages relate products style emiliano ponzi colour black shade red shade light aqua blue white color store priority

picture

---

forest flower myth fern flower imagination slavic plant

flower

Accuracy: 0.6774193548387096

Menu

- ▷ Training & Testing Model
- ☰ **Classify Prompts**
- ⊡ Input a Prompt

Prediction Results:

	deskripsi	predicted_kelas
0	flower line art clean and simple, flower is white but bold black lines create the shape	flower
1	tulip flower line art clean and simple, flower is white but bold black lines create the s	flower
2	rose flower line art clean and simple, flower is white but bold black lines create the s	flower
3	dahlia flower line art clean and simple, flower is white but bold black lines create the	flower
4	daisy flower line art clean and simple, flower is white but bold black lines create the	flower
5	orchid flower line art clean and simple, flower is white but bold black lines create the	flower
6	forest flower, myth fern flower, imagination, slavic plant	flower
7	random flower patten, flower texture for print --v 6.0	flower
8	printable flower patterns, watercolor, flower texture, colorful --v 6.0 --s 750	flower
9	beautiful full body of a black model woman with a blue rose flower covering entire fa	flower

Menu

▷ **Training & Testing Model**

≔ Classify Prompts

⊟ Input a Prompt

Generative Image Prompt Classification

Upload your Training Dataset

☁ Drag and drop file here
Limit 200MB per file • CSV

Browse files

Menu

▷ Training & Testing Model

≔ **Classify Prompts**

⊟ Input a Prompt

Generative Image Prompt Classification

Classify Your Full Dataset of Prompts

Upload Your Testing Dataset

☁ Drag and drop file here
Limit 200MB per file • CSV

Browse files

Menu

▷ Training & Testing Model

≔ Classify Prompts

⊟ **Input a Prompt**

Generative Image Prompt Classification

Enter a new prompt for classification:

Write here ..

Classify
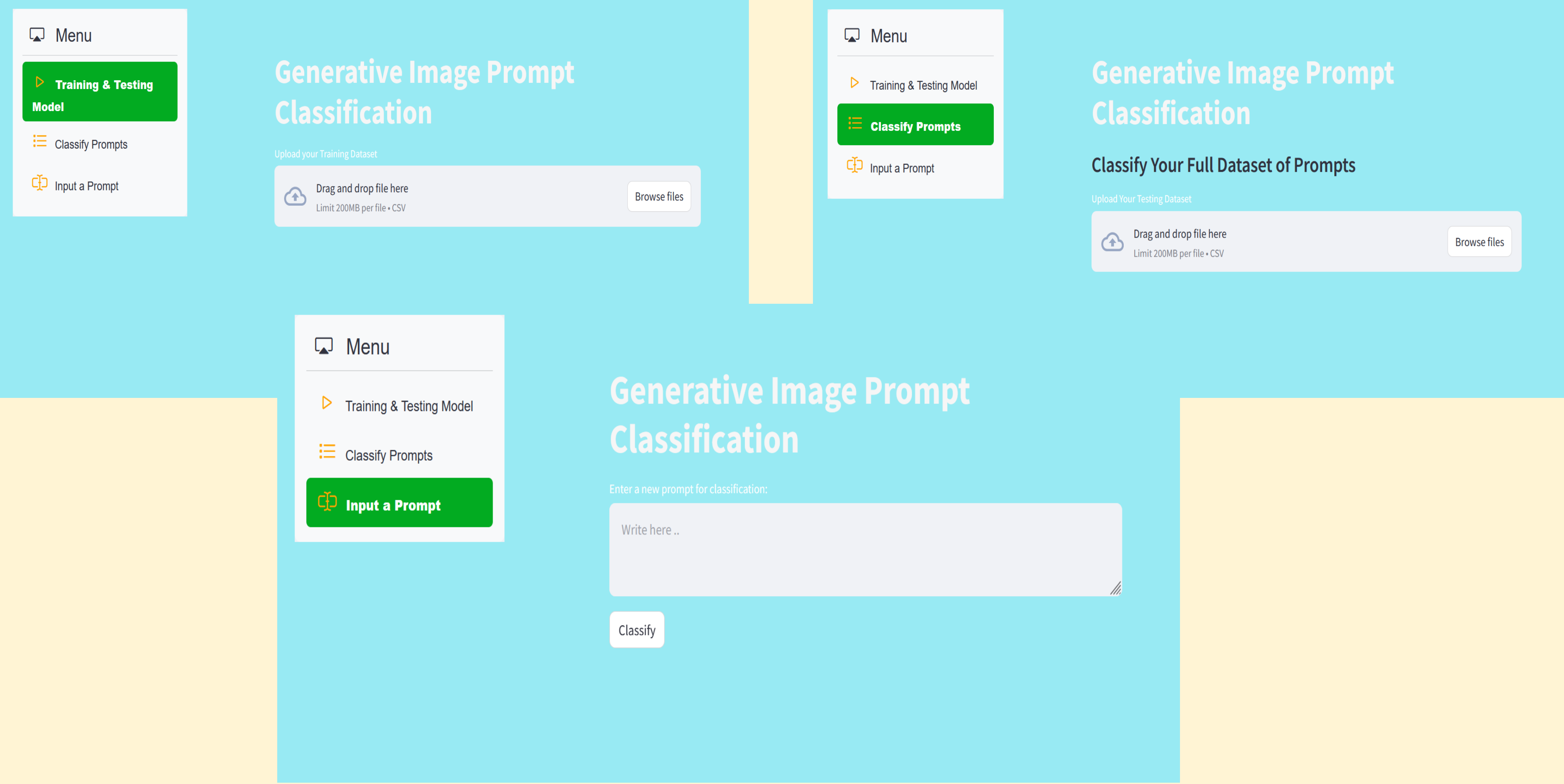
Desktop Application View
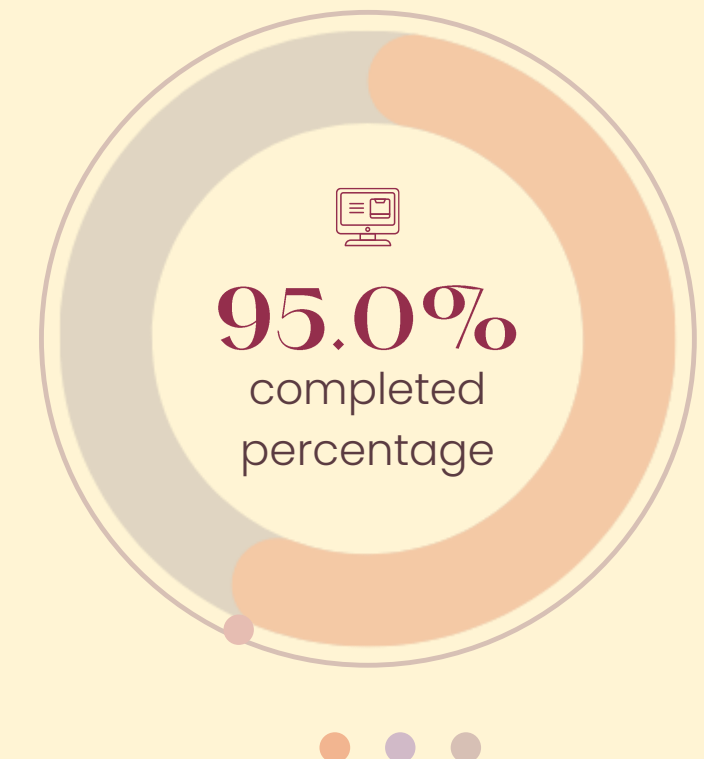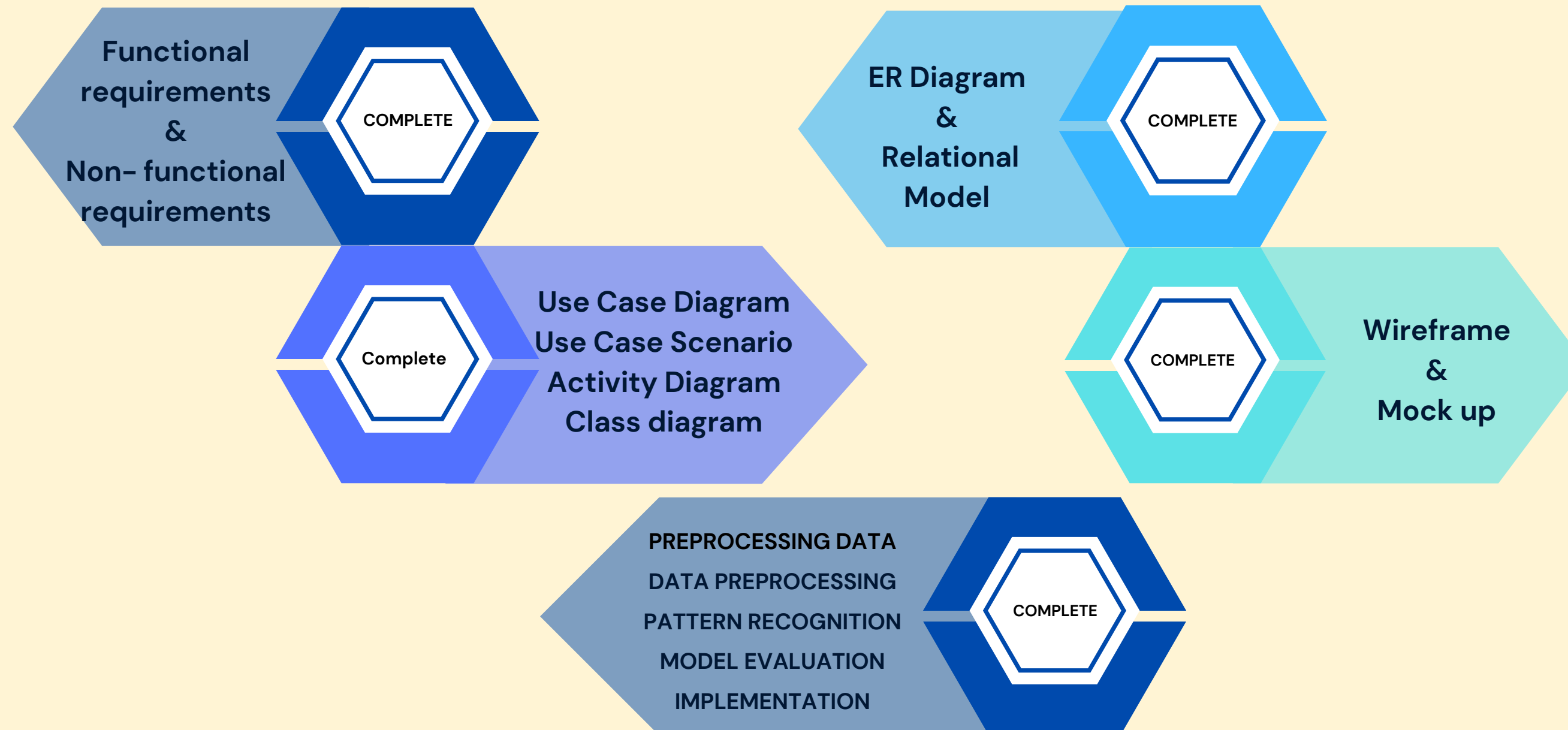
Project Execution History

ID	Tahapan	Detail Pengerjaan	Ouput	📅 Mulai	📅 Selesai	Progress
1	Planning	Develop a project plan that includes scope, general design, product design, equipment requirements, challenges and issues, estimated work time, project cost, project team, workspace, issues involved, communication beetwen project manager and client, monitoring and evaluation.	Document implementation plan (RPP)	2024-02-05	2024-02-26	5%
2	Planning	Develop a project plan that includes the steps to be taken, team responsibilities, work schedule, estimated costs, and resources required.	Document of Project Plan	2024-02-05	2024-02-26	10%
3	Analysis	Create a list of functional and non-functional requirements for the Generative Prompt Image Classification on the Promptails website. Functional requirements will identify the functions of the system that need to be implemented, while non-functional requirements will specify the performance, security, and reliability criteria that the system must fulfil.	Analysis Requirements document that contains all the need of the project.	2024-02-27	2024-02-29	15%
4	System Analysis	Develop comprehensive use case scenarios derived from the identified use cases for the "Classification of Image Prompt Generative on Promptails Website" project.	Use Case Document	2024-03-01	2024-03-04	20%

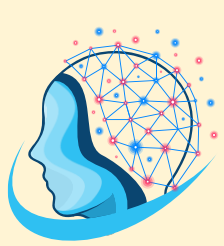| 5	System Analysis	Develop the Usecase Diagram for the "Classification of Image Prompt Generative on Promptails Website" project, illustrating the relationships between actors, and use cases.	Document of Usecase diagram	2024-03-05	2024-03-07	25%
6	Design	Develop wireframes for the user interface of the "Classification of Image Prompt Generative on Promptails Website" project, outlining the layout and functionality of each page.	a Document containing wireframe designs.	2024-03-06	2024-03-11	30%
7	Design	Develop visual mockups for the user interface of the project "Classification of Image Prompt Generative on Promptails Website" outlining the layout, navigation, and visual elements.	a Document containing mockup designs	2024-03-12	2024-03-16	35%
8	Design - ER Diagram	Analyzing system data requirements and designing the structure of the ER (Entity-Relationship) Diagram that reflects the relationships between the main entities in the database of the "Classification of Image Prompt Generative on Promptails Website" Project.	a Document containing ER-Diagram designs.	2024-03-17	2024-03-22	45%
9	Design - Activity Diagram & Class Diagram	Analyzing system functionality and workflow to create the Activity Diagram. Identifying classes, attributes, and methods based on system requirements to develop the Class Diagram for the "Classification of Image Prompt Generative on Promptails Website" project.	a Document containing Activity Diagram & Class Diagram designs.	2024-03-24	2024-04-05	55%

10	Implementation - Preprocessing Data	Gathering raw data from various sources. Removing or correcting incomplete, duplicate, or incosistent data. Converting caterogical data into numerical form if necessary (encoding). Dividing the dataset into training, validation, and test sets for better evaluation.	Clean Training Dataset & Testing Dataset	2024-05-06	2024-05-11	60%
11	Implementation - Preprocessing Data	Reducing the number of features in the dataset using techniques like feature selection. Identifying and extracting relevant features from raw data. Addressing class imbalance issues in the data. Increasing the size and diversity of the dataset by modifying existing data.	Clean Training & Testing Dataset	2024-05-13	2024-05-18	65%
12	Implementation - Pattern Recognition	Defining the goal of pattern recognition such as classification. Choosing the appropriate algorithm for the pattern recognition task based on the nature of the data and the analysis objective. Training the model using the training dataset with the selected algorithm. Iterating and refining the model based on training results.	Model for Classification	2024-05-20	2024-05-25	75%
13	Implementation - Model Evaluation	Evaluating the model's performance using the validation dataset. Using appropriate evaluation metrics, such as accuracy. Optimizing the model's hyperparameters to improve performance.	Trained and Validated Model	2024-05-27	2024-06-01	85%
14	Model Implementation	Convert the trained model into a deployable format such a pickle file in python. create an API to interact with the model. Use frameworks like streamlit. Perform extensive testing to ensure the model works as expected. Maintain and update the model and the infrastructure.	Classification Web	2024-06-02	2024-06-22	95%

Constraints on Project Completion

1. **Algorithm Complexity:** The implementation of complex machine learning algorithms such as Convolutional Neural Networks (CNN) requires deep understanding and sufficient time for development and testing.
2. **System Integration:** Integrating the classification model into the Promptails Website platform requires a good understanding of the technological infrastructure used and ensuring compatibility between the existing system and the built model.
3. **Time Management:** It is difficult to organise time for teamwork, due to work and other matters.
4. **Team Skills:** Limited skills and experience of team members in Project development.

Labour Division

Table 4. Group member contributions

Member Name	Contribution	Outputs produced
Samuel Parsaoran Tambunan	- Scheduling - Creation of Project Implementation Plan - Project Documentation - Front End Programming - Back End Programming - Application Testing - Application Training	- Project Implementation Plan Report - Project Creation Report - Application Testing Report - Logbook - Presentation Report - Video Presentation - App Page View - SQLite Database
Sechan Faradila Sahab	- Usecase Diagram - Usecase Scenario	- Usecase Diagram - Usecase Scenario
	- Functional & non-functional - Dataset	- Functional & non-functional documents - Data Cleaning
Muhamad Rafiansyah	- Creating UI/UX Design - Creating Wireframes - Back End Programming - Application Programming - Application Training - Application Testing	- Wireframe View - Integration of Artificial Intelligence System into Front End - Integration of Prediction System into Front End - Modeling - Application Manual Book
Putra Ramadhan	- Project Planning - Application Mock up	- Project Planning Report - Mock Up Display
Alpaber Pardomuan Tambunan	Logbook	Logbook

Next Work Plan

1. Classification Model Building (Done)
2. Data Augmentation (Done)
3. Model Training and Evaluation (Done)
4. Integration with Website Promptails (Done)
5. Testing and Validation (Done)
6. Monitoring and Controlling (Done)
7. Final Evaluation (On Progress)

Thank You

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