Project Design Phase-II

Data Flow Diagram & User Stories

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| Date | 23rd October 2023 |
| Team ID | PNT2022TMID592713 |
| Project Name | Project - Safeguarding Agriculture: AI-Enabled  Prognostication of Farm Insect Threats |
| Maximum Marks | 4 Marks |

# Data Flow Diagrams:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

A diagram of a process

Description automatically generated

**User Stories**

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| **User Type** | **Functional**  **Requirement (Epic)** | **User Story Number** | **User Story / Task** | **Acceptance criteria** | **Priority** | **Release** |
| Farmers, Agricultural Researchers  (Mobile user) | USER INTERFACE AND IMAGE UPLOAD | USN-1 | As a user, I want to be able to interact with the UI to choose an image for analysis. | You can access the web interface by entering the application's URL in your web browser, ensuring it is responsive and compatible with different web browsers. | High | Sprint-2 |
| Developer |  | USN-2 | As a user, I want the web interface to include an "Upload" button to submit an image. | Users should be able to browse their device to select an image for analysis, and upon selection, the chosen image should be displayed in the UI. | High | Sprint-2 |
|  | FLASK MODEL INTEGRATION | USN-3 | As a user, I want the chosen image to be analyzed by a model integrated with a Flask application. | Upon selecting an image, it should be automatically sent to the Flask application for analysis, which then receives and processes the selected image. | Medium | Sprint-2 |
|  |  | USN-4 | As a user, I want the application to use CNN models to analyze the chosen image. | The application should employ CNN models to conduct comprehensive image analysis, considering pertinent image features and characteristics, | High | Sprint-2 |
| Data Scientist | DATA COLLECTION AND  PREPROCESSING | USN-5 | As a data scientist, I want to download and pre-process the dataset for training the CNN model. | Access to a relevant dataset related to the problem domain is a prerequisite, and the dataset must undergo preprocessing steps like resizing, normalizing, and data splitting to ensure it's prepared for CNN model training. | High | Sprint-1 |
|  | MODEL BUILDING, TRAINING AND EVALUATION | USN - 6 | As a data scientist, I want to build a VGG16 model for image analysis. | It involves the following:  Importation of necessary libraries for building the VGG16 model.  Definition of the input shape for the image data.  Addition of convolutional, pooling, and fully connected layers.  Compilation of the model with optimizer, loss function, and metrics. | High | Sprint- 1 |
|  |  | USN - 7 | As a data scientist, I want to train the VGG16 model using the training dataset and ImageDataGenerator for image augmentation. | Training the VGG16 model using the training dataset.  Applying image augmentation using ImageDataGenerator.  Monitoring the accuracy of the validation set to prevent overfitting. | High | Sprint- 1 |
|  |  | USN - 8 | As a data scientist, I want to evaluate the performance of the trained VGG16 model on the testing dataset. | Evaluation of the trained model's performance on the testing dataset by using calculation of accuracy and other relevant metrics for assessment | High | Sprint- 1 |
| Developer. | MODEL SAVING AND DEPLOYMENT | USN – 9 | As a developer, I want to save the trained VGG16 model for future use and deploy it in real-world applications. | Saving the trained VGG16 model for future use.  Enabling deployment of the model in real-world applications.  Providing documentation and guidelines for deployment. | Medium | Sprint- 1 |