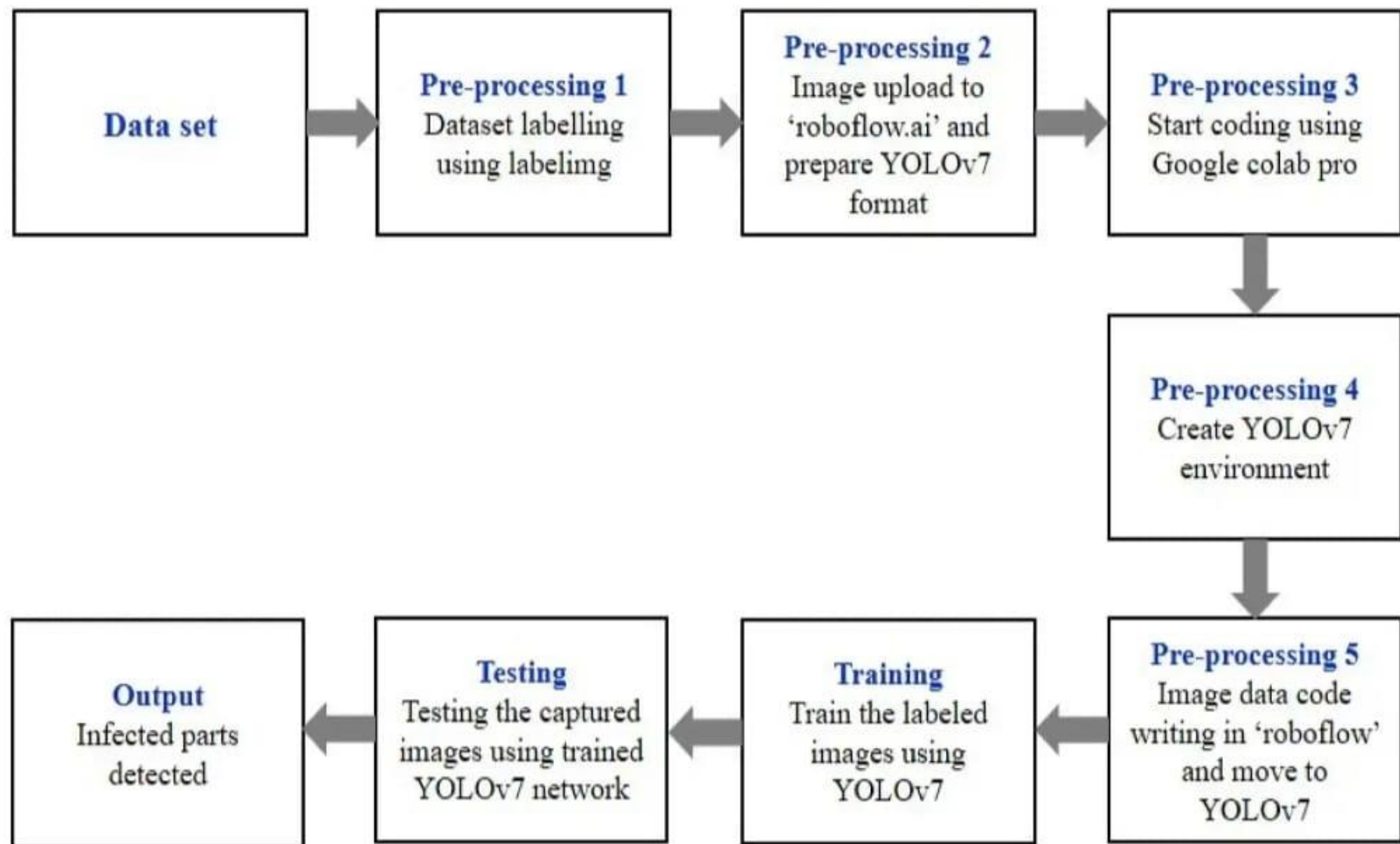


**Project Design Phase-II**  
**Technology Stack (Architecture & Stack)**

Date	06 May 2023
Team ID	PNT2022TMIDxxxxxx
Project Name	Project - xxx

**Technical Architecture:**



S.No	Component	Description	Technology
1.	Dataset	Collect a comprehensive dataset of tea leaf images representing various diseases and healthy leaves	LibriSpeech ,CIFAR-10,CIFAR-100,MNIST
2.	preprocessing	Preprocess the tea leaf image to enhance their quality and prepare them for training	Libraries like Natural Language Toolkit,spaCy
3.	Deep learning framework	Choose a deep learning framework such as TensorFlow,PyTorch or keras	Caffe,MXNet,Theano,Microsoft Cognitive Toolkit
4.	Model architecture	Design an appropriate deep learning architecture for tea leaf disease detection	CNNs,RNNs,LSTM,GANs,RL
5.	Transfer learning	Leverage transfer learning by utilizing pre trained models on large scale like image dataset	ImageNet or Pre trained CNNs models
6.	Training	Train the deep learning model using the labeled tea leaf dataset	Gradient –based optimization,backpropagation.
7.	Validation	Validate the trained model using a separate validation dataset to monitor its performance	Cross validate,holdout validate,metrics and evaluation
8.	Testing	Test its accuracy and generalization on a separate test dataset	ONNX RunTime,TensorRT,A/B testing
9.	Deployment	Deploy the trained model for disease detection in tea leaf	Raspberry Pi NVIDIA jetson
10.	Model evaluation	Continuously evaluate the model's performance on new tea leaf images	Scikit-learn or Tensorflows.
11.	Continuous improvement	As a new set of data becomes available or new diseases are identified	Data Version Control or data versioning tools

**Table-2: Application Characteristics:**

S.No	Characteristics	Description	Technology
1.	Hierachical Representation	Deep learning models are designed to learn hierarchical representations of data.	Technology of Opensource framework
2.	Non-Linearity	Deep learning models incorporate non-linear activation functions, such as sigmoid, tanh, or rectified linear unit (ReLU), to introduce non-linearity into the network.	WORD2VEC,GloVe,RNNs,GRU,LSTM.
3.	Feature Extraction	Deep learning models are adept at automatically extracting relevant features from raw or high-dimensional data.	Technology used CNNs,Autoencoders,PCA
4.	Generalization	Deep learning models aim to generalize well to unseen data by learning from a diverse range of examples during training	Technology used Cross validate
5.	Black Box Nature	Deep learning models are often characterized as Black Boxes due to the difficulty in interpreting their internal representation and decision making process	Technology used Grad-Cam,SHAP