**Project Initialization and Planning Phase**

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| Date | 20/06/2025 |
| Team ID | SWTID1749826875 |
| Project Title | Dog Breed Identification using Transfer Learning |
| Maximum Marks | 3 marks |

**Project Proposal (Proposed Solution)**

The proposal report aims to build an intelligent breed classification system using transfer learning that consistently outperforms traditional methods by accurately identifying dog breeds, even among visually similar categories

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| **Project Overview** | |
| Objective | To develop a high-accuracy image classification system capable of identifying dog breeds, even with subtle visual differences, using transfer learning. |
| Scope | The system will classify dog breeds from images and be deployable for use in applications such as pet registration, veterinary support, animal shelter systems, and lost pet recovery. |
| **Problem Statement** | |
| Description | Accurate breed identification is challenging due to the high degree of visual similarity among breeds. This project utilizes pre-trained convolutional neural networks (e.g., ResNet, EfficientNet) fine-tuned on a curated dataset of labeled dog breed images. The goal is to enable reliable, real-time classification by learning fine-grained visual features. |
| Impact | **Pet owners:** Simplified registration and breed recognition.  **Veterinarians:** Tailored health guidance based on breed-specific traits.  **Animal shelters:** Faster breed identification for adoption/rescue.  **Lost pet services:** Visual matching of found animals with missing pet databases. |
| **Proposed Solution** | |
| Approach | 1. **Dataset Collection & Curation** (from open sources like Kaggle/Stanford Dogs) 2. **Data Augmentation** for better generalization 3. **Transfer Learning** using models like ResNet50 or EfficientNetB0 4. **Fine-tuning** with breed-specific layers 5. **Evaluation** using metrics like accuracy, precision, and recall 6. **Deployment** via a web/mobile interface |
| Key Features | * High-accuracy classification of over 100 dog breeds * Fine-grained feature recognition (e.g., snout shape, coat texture) * Lightweight, fast inference for mobile/web deployment * Scalable for future addition of new breeds * API support for integration into external applications |

**Resource Requirements**

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| **Resource Type** | **Description** | **Specification/Allocation** |
| **Hardware** | | |
| Computing Resources | CPU/GPU specifications, number of cores | e.g., T4 GPU or v2-8 TPU |
| Memory | RAM specifications | e.g., 8 GB |
| Storage | Disk space for data, models, and logs | e.g., 1 TB SSD |
| **Software** | | |
| Frameworks | Python frameworks | e.g., Flask |
| Libraries | Additional libraries | e.g., tensorflow |
| Development Environment | IDE, version control | e.g., Jupyter Notebook, Git |
| **Data** | | |
| Data | Source, format | e.g., Kaggle dataset, 1168 images |