Project Initialization and Planning Phase

Date	15 July 2024
Team ID	740682
Project Title	Polycystic Ovary Syndrome Classification Using Machine Learning
Maximum Marks	3 Marks

Project Proposal (Proposed Solution) template

This project proposal outlines a solution to address a specific problem. With a clear objective, defined scope, and a concise problem statement, the proposed solution details the approach, key features, and resource requirements, including hardware, software, and personnel.

Project Overview	
Objective	The primary objective of this project is to develop a robust prediction model and standardized diagnostic criteria for Polycystic Ovary Syndrome (PCOS). This model aims to provide comprehensive information for accurate identification and diagnosis of PCOS among patients.
Scope	The project will encompass the collection, analysis, and presentation of clinical and diagnostic data related to PCOS. This includes: • Detailed analysis of symptoms, hormonal profiles, and diagnostic criteria used in current medical practices. • Development of a predictive model using machine learning algorithms to assist in early detection and classification of PCOS. • Evaluation of different diagnostic criteria and their effectiveness in diverse patient populations. • Creation of a user-friendly platform, potentially a mobile app or web-based tool, to disseminate information and aid healthcare providers in accurate diagnosis.

Problem Statement	
Description	PCOS affects a significant number of women worldwide, yet diagnosis remains challenging due to the variability in symptoms and diagnostic criteria used by healthcare providers. Existing diagnostic tools often lack consistency and can lead to misdiagnosis or delayed treatment.
Impact	Solving this problem will improve healthcare outcomes by providing healthcare providers with a standardized approach to diagnose PCOS accurately. This will facilitate early intervention, personalized treatment plans, and improved management of symptoms for affected individuals. Ultimately, it will contribute to better health outcomes, quality of life improvements, and reduced healthcare costs associated with PCOS.

Proposed Solution	
Approach	The project will adopt a systematic approach tailored for the classification of Polycystic Ovary Syndrome (PCOS): 1. **Data Collection:** Gather comprehensive data from medical literature, clinical databases, and expert consultations. This includes symptoms profiles, hormonal levels, ultrasound findings, and other relevant diagnostic markers. 2. **Analysis:** Conduct detailed comparative studies to analyze the effectiveness of different diagnostic criteria and classification algorithms for PCOS. Evaluate their performance across diverse patient populations and clinical settings. 3. **Presentation:** Develop an accessible platform, such as a web-based application or mobile interface, to present the synthesized information. Ensure the platform is user-friendly, allowing healthcare providers to easily navigate and utilize the classification tools effectively.
Key Features	• **Comprehensive Data:** Detailed descriptions and characteristics of PCOS diagnostic criteria, including hormonal imbalances, menstrual irregularities, and ovarian morphology. • **Comparative Analysis:** Clear comparisons of different diagnostic criteria sets (e.g., Rotterdam criteria, NIH criteria) to highlight their strengths and limitations in diagnosing PCOS. • **Practical Guidance:** Provide healthcare professionals with practical guidance on interpreting

diagnostic criteria and implementing classification algorithms in clinical practice.

- **Accessibility:**

Ensure the platform is intuitive and accessible, supporting healthcare providers of varying technical backgrounds in making informed decisions about PCOS diagnosis.

Resource Requirements

Resource Type	Description	Specification/Allocation
Hardware		
Computing Resources	CPU/GPU specifications, number of cores	T4 GPU
Memory	RAM specifications	8GB or 16GB
Storage	Disk space for data, models, and logs	1 TB SSD
Software		
Frameworks	Python frameworks	Flask
Libraries	Additional libraries	scikit-learn, pandas, numpy ,matplotlib
Development Environment	IDE, version control	Jupyter Notebook, Git , Google Colab
Data		
Data	Source, size, format	Kaggle dataset, 10,000 images