Project Design Phase-I

Proposed Solution Template

Date	1 October 2022
Team ID	PNT2022TMID49841
Project Name	Project – Predictive Analytics for Aircraft Engine
Maximum Marks	2 Marks

Proposed Solution Template:

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Engine failure is highly risky and needs a lot of time for repair. Unexpected failure leads to loss of money and time. Predicting the failure prior will save time, effort, money and sometimes even lives. The failure can be detected by installing the sensors and keeping a track of the values. The failure detection and predictive maintenance can be for any device, out of which we will be dealing with the engine failure for a threshold number of days. The project aims to predict the failure of an engine by using Machine Learning to save loss of time & money thus improving productivity.
2.	Idea / Solution description	The failure can be detected by installing the sensors and keeping a track of the values. The failure detection and predictive maintenance can be for any device, out of which we will be dealing with the engine failure for a threshold number of days.Based on machine learning-applied data science it aims to predict the failure of an engine.the sustainability of waste services.
3.	Novelty / Uniqueness	Predicting the failure prior will save time, effort, money and sometimes even lives.Through its predictive analysis techn iques we can easily detect the failures and take appropriate measures.
4.	Social Impact / Customer Satisfaction	Using IoT and smart sensors, waste management companies can increase

5.	Business Model (Revenue Model)	Machine Learning generates revenue through the provision of various aircraft management and other services and provide solutions to residential, commercial, industrial, and all other aircraft managements. The Company derives its revenue in the form of various fees associated with its service offerings.
5.	Scalability of the Solution	It is found that scaling down of engines is detrimental to SFC and fuel burn, mainly due to the Reynolds number effect. The more scaling done, the more prominent the effect. It is determined that new technology such as higher TIT, OPR and turbomachinery [eta]poly's for aircraft engines enable the operation of larger bypass ratios, which is the most influential parameter to SFC and fuel bum. The increase of bypass ratio up to a value of 8 is found to be effective for such improvement. SFC decrease from the current to mid-term model is found to be ~20% and ~9% from mid-term to far-term. Range and endurance improvements are found to be ~30% and ~10% respectively for the mission examined. Finally, the mid-term engine model has performance comparable to that of a current, larger state-of-the-art engine, thus suggesting that improvement in small gas turbine technology in the next 10 years will make the application of commodity thrust or distributed propulsion an attractive option for future aircraft.