

Project Design Phase-I
Proposed Solution Template

Date	19 September 2022
Team ID	PNT2022TMID43192
Project Name	Project- Machine Learning-Based 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)	<p>Machine Learning-Based Predictive Analytics for Aircraft Engine</p> <p>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.</p> <p>The project aims to predict the failure of an engine by using Machine Learning to save loss of time & money thus improving productivity.</p>
2.	Idea / Solution description	<p>Big data and machine learning are transforming the global business environment. Data is now the most valuable asset for enterprises in every industry. Companies are using data-driven insights for competitive advantage. With that, the adoption of machine learning-based data analytics is rapidly taking hold across various industries, producing autonomous systems that support human decision-making. This work explored the application of machine learning to aircraft engine conceptual design. Supervised machine-learning algorithms for regression and</p>

		<p>classification were employed to study patterns in an existing, open-source database of production and research turbofan engines, and resulting in predictive analytics for use in predicting performance of new turbofan designs. Specifically, the author developed machine learning-based analytics to predict cruise thrust specific fuel consumption and core sizes of high-efficiency turbofan engines, using engine design parameters as the input. The predictive analytics were trained and deployed in Keras, an open-source neural networks application program interface (API) written in Python, with Google's TensorFlow serving as the backend engine. The promising results of the predictive analytics show that machine-learning techniques merit further exploration for application in aircraft engine conceptual design</p>
3.	Novelty / Uniqueness	<p>A jet engine is similar to a piston engine, but it is a little more complex. Instead of having a design which uses fuel burned to move pistons through a four-stroke cycle, a jet engine is powered by constantly spinning turbine blades. Making the turbine blades spin, requires a continuous supply of fuel and air to burn.</p>
4.	Social Impact / Customer Satisfaction	<p>Drive to safety of human and Infrastructure loss</p>
5.	Business Model (Revenue Model)	<p>Aviation companies can generate business by providing the best solutions and Services. Engine manufacturers increasingly globally-linked world aircraft engine are an important component for transport applications, including commercial, military, business, and general aviation. While some aircraft engine manufacturers and companies choose to focus on producing one or two engines, others have large portfolios of engines for different uses, and still others custom manufacture or specialize in engines to fill a specific niche application. To assist in your sourcing efforts and understanding of the aircraft engine marketplace.</p>

6.	Scalability of the Solution	Reducing the lift to drag ratio of an aircraft can make it more aerodynamically efficient and help reduce the aircraft's weight and fuel use.
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