# INTRODUCTION

The Performance characteristics estimator system is a program application designed exclusively for the single-phase induction motor. It can be used by wide variety of Industries who depend on these motors for their daily industrial processes and students who are in need to find these parameters by undergoing a lot of tests in a huge hardware setup with necessary precautions and lab technicians who are in a need to react very quickly if any errors occur in the machine. In a single -phase induction motor it is required to conduct more than ten different tests to calculate these parameters of performance characteristics. This Program will definitely save the time of the users and at the same time ensures the safety of them. This program requires a minimum knowledge to handle. Any user who knows to send inputs and receive outputs is capable of operating this program.

FEATURES

- Calculation of Synchronous frequency.
- Calculation of Synchronous speed.
- Calculation of Power developed.
- Calculation of Output power.
- Calculation of Shaft torque.
- Calculation of Efficiency.
- Calculation of Total losses.
- Calculation of Rotor power.
- Calculation of Torque developed in forward direction.
- Calculation of Torque developed in backward direction.

BLOCK DIAGRAM

Total losses	Efficiency	Power developed	Output power	Shaft torque

Estimator system

Synchronous frequency	Synchronous speed	Rotor power	Torque developed in forward direction	Torque developed in backward
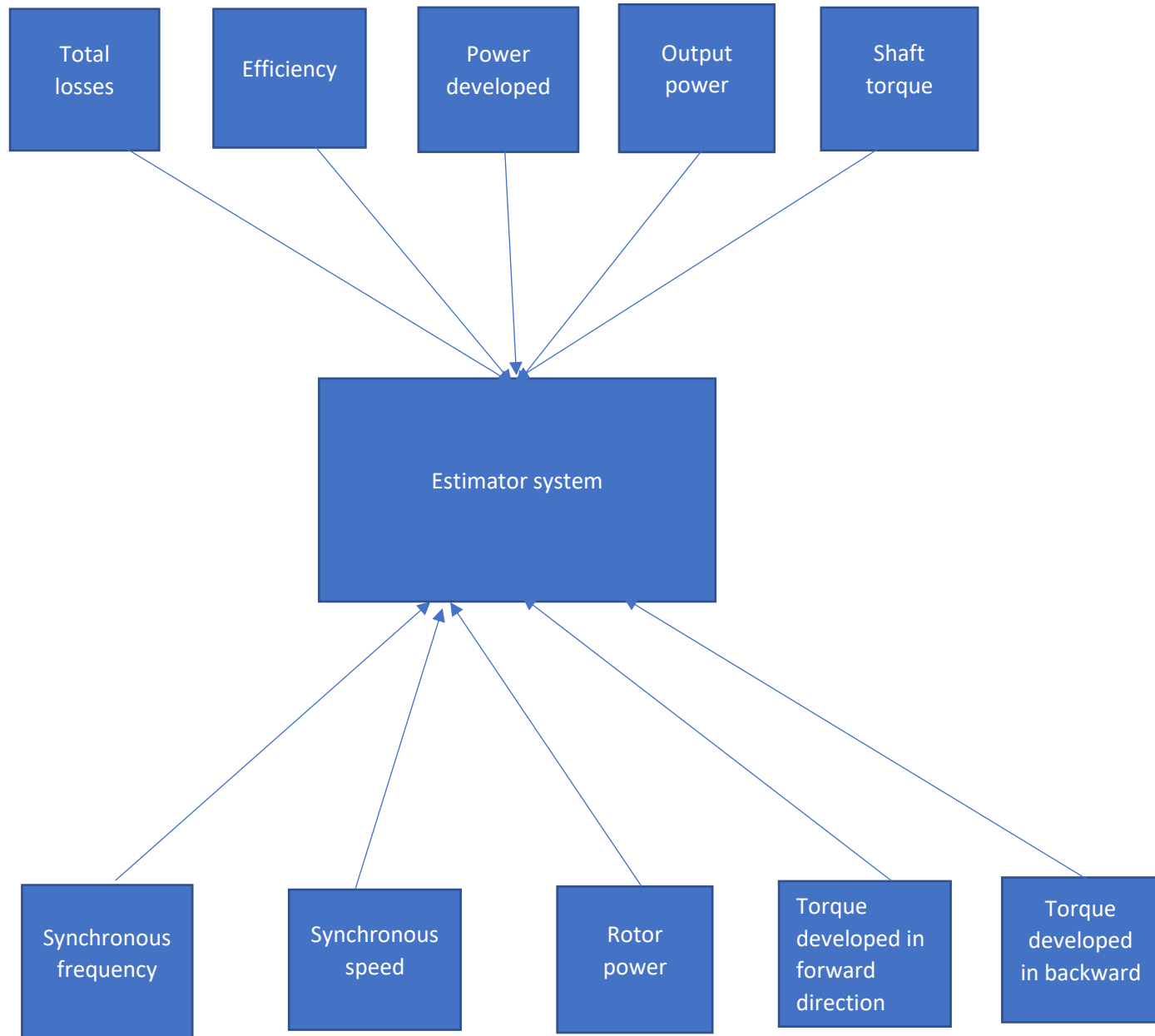
SWOT ANALYSIS

STRENGHTS

Conducting these tests directly on machine cannot guarantee safety of the unskilled user, as any type of fault can occur at any time and result in huge loss.

WEAKNESSES

Test results from hardware are more prone to errors (like heat) and results in a practical value whereas a software do not account these errors.

OPPOTUNITIES

Can be employed everywhere where unskilled labours are asked to work in these machines. Comes as a handy tool for students and lab technicians who needs immediate and theoretical results.

THREATS

Industries prefer practical(error prone) results than theoretical results. So they may find this software to be usable only for rare scenarios and when there is a scenario to handle the machine with unskilled labours.

4W's and 1H

WHO?

This program application can be used by Industrial labours, Students and Lab technicians and at times even an unskilled labour.

WHY?

Performing many number of tests with heavy equipment and safety precautions can be eliminated with the help of this software.

WHEN?

When the industrial labour cannot perform the test on required machine, when a student feels difficult to remember the testing procedure for determination of the performance characteristics that takes, when the lab technician is in an immediate need to check for the error, during these periods they can use this application program.

WHERE?

The program can be made to run on any industries equipped with basic computer systems and educational institutions employed with computers.

HOW?

The user is provided with multiple characteristics and he can use the choice option to select and obtain the desired result for a specific characteristics.

HIGH LEVEL REQUIREMENTS

ID	DESCRIPTION	STATUS
H1	Calculation of Synchronous frequency	Implemented
H2	Calculation of Synchronous speed	Implemented
H3	Calculation of Power developed	Implemented
H4	Calculation of Output Power	Implemented
H5	Calculation of Shaft torque	Implemented
H6	Calculation of Efficiency	Implemented
H7	Calculation of Total losses	Implemented
H8	Calculation of Rotor power	Implemented
H9	Calculation of Torque developed in forward direction	Implemented
H10	Calculation of Torque developed in Backward direction	Implemented

LOW LEVEL REQUIREMENTS

ID	DESCRIPTION	ID	STATUS
L1	Calculation of Synchronous frequency by getting inputs such as Slip and Rotor frequency from user	H1	Implemented
L2	Calculation of Synchronous speed by getting inputs such as number of poles from user and Synchronous frequency from previous function	H2	Implemented
L3	Calculation of Power developed by getting inputs such as Torque developed and mechanical losses from user.	H3	Implemented
L4	Calculation of Output power by getting inputs such as power developed and	H4	Implemented
L5	Calculation of Shaft torque by getting inputs such as output power and from previous function	H5	Implemented
L6	Calculation of Efficiency by getting inputs such as Input power from user and Output power from fourth function	H6	Implemented
L7	Calculation of Total losses by getting inputs such as Input power from user and Output power from fourth function	H7	Implemented
L8	Calculation of Rotor power by getting inputs such as Torque developed and copper loss from user.	H8	Implemented
L9	Calculation of Torque developed in forward direction by getting inputs such as Torque developed from user and Rotor power from previous function	H9	Implemented
L10	Calculation of Torque developed in backward direction by getting inputs such as Torque developed from user and Rotor power from previous function	H10	Implemented