**PREDICTIVE MAINTENANCE OF INDUSTRIAL MOTORS**

**INTRODUCTION**

Modern equipment helps maintenance technicians predict or identify imminent failures before they cause costly unplanned downtime of motors and the rotating machinery they support.The goal of a predictive maintenance program is almost always to reduce unscheduled downtime

**1.1 OVERVIEW**

The aim to detect predictive problems in a rotating electric machine, such as: problems in the stator winding, rotor problems, problems on the engagement, problems in bound load, efficiency and system load; problems in the bearing, among others.

**1.2 PURPOSE**

Predictive maintenance (PdM) is a technique to predict when equipment might fail so that the component can be replaced before the failure.Predictive maintenance aims to prevent the occurrence of failure by performing maintenance. It helps in averting unplanned and unnecessary downtime that can affect the company.

**2 LITERATURE SURVEY**

Predictive Maintanence: Literature Review and Future Trends. In manufacturing industry machines and systems become more advanced and complicated. Well applied predictive maintenance cases more cost effective than traditional corrective and preventive approaches to maintenance.

**2.1 EXISTING PROBLEM**

The main focus of problems in three-phase **induction motors** are in the stator and the supports. The main causes of failures are: superheating, imperfections in the isolation, mechanical bearings and electric failures.

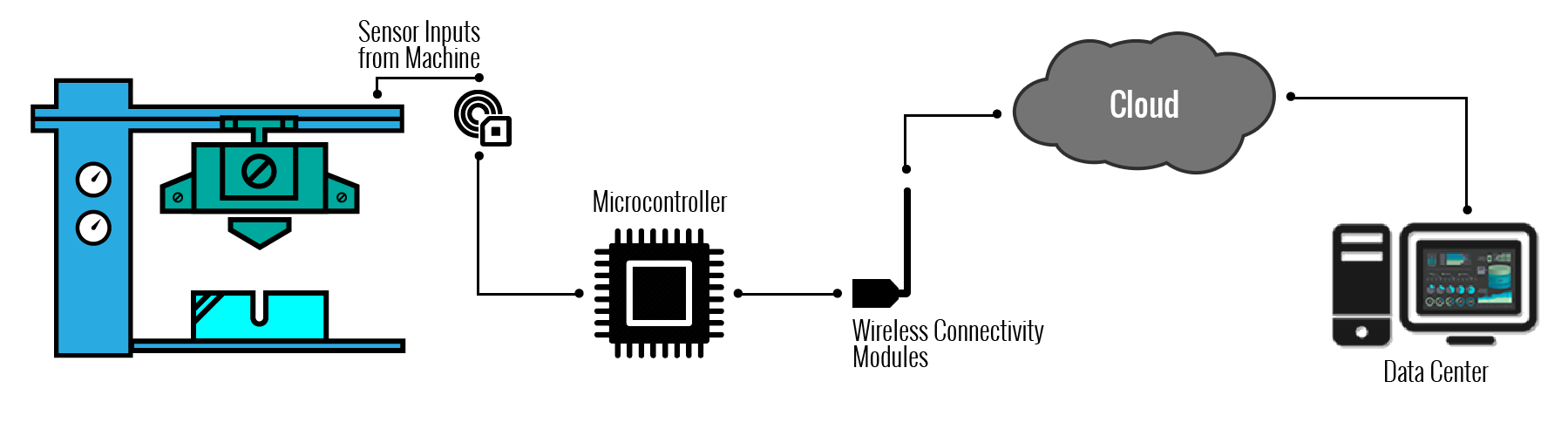
**2.2 PURPOSED SOLUTION**

There are several ways of carrying out maintenance on electric motors. The first is simply run ... Vibration analysis is one of the most commonly used predictive maintenance ...proposes methods to reduce accelerated wear and contamination

**3 THEORITICAL ANALYSIS**

predictive maintenance in order to detect and diagnosis of rolling bearings wear. ... As in other industrial fields, the types of maintenance, which are applied on the ... the motor; ROI 1, the drive bearing of the motor, ROI 3 the main bearing.

**4 BLOCK DIAGRAM:**



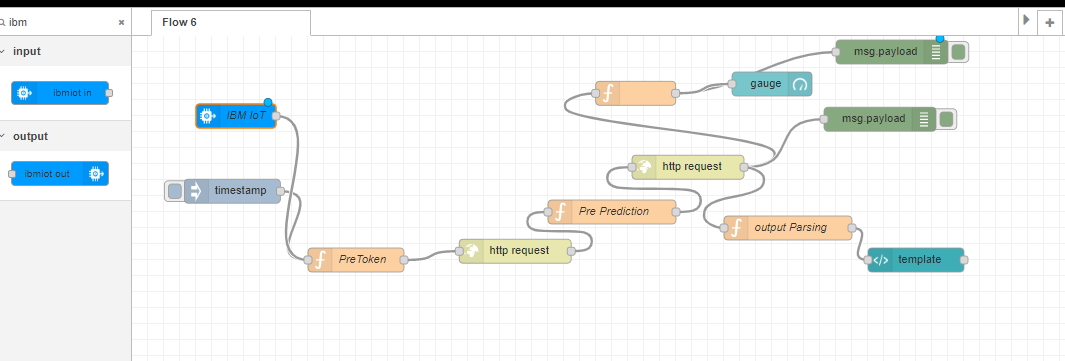
**4.1 SOFTWARE/HARDWARE DESIGNING:**

Programing Language: Python

Application : Machine Learning

**5  FLOW CHART:**

**5**



**6 ADVANTAGES:**

* Reduction in maintenance costs.
* Reduction in machine failures.
* Reduced downtime for repairs.
* Reduced stock of spare parts.
* Increased service life of parts.
* Increased production.
* Improved operator safety.
* Verification of repairs

**6 DISADVANTAGES:**

The most common techniques applied to fault detection in industrial motors are: vibration analysis, temperature analysis, speed oscillations, partial discharges, circuit analysis, etc.

**7 CONCLUSION:**

Predictive maintenance program is the key to dependable, long-life operation of motors and generators.In modern plant operations, unscheduled stoppage of production or long repair shutdowns are intolerable. The high cost of the resultant downtime eats deeply into profits. Although management probably realizes the value of a good preventive maintenance (PM) program, they sometimes resist

**8 FUTURE SCOPE:**

By adopting a predictive-maintenance (PdM) strategy, you can mine your critical-asset data and identify anomalies or deviations from their standard performance.This can help you avoid unplanned downtime, reduce industrial maintenance overspend, and mitigate safety and environmental risks.

It covers all aspects of motor systems including motor repairs, and predictive & preventive maintenance. Nine useful appendices are included

**9 BIBILOGRAPHY**

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**10 APPENDIX**

**SOURCE CODE:**

import time

import sys

import ibmiotf.application

import ibmiotf.device

#Provide your IBM Watson Device Credentials

organization = “ug0cd7" # repalce it with organization ID

deviceType = "iotproject" #replace it with device type

deviceId = "1827" #repalce with device id

authMethod = "token"

authToken = "1234567890"#repalce with token

def myCommandCallback(cmd):

print("Command received: %s" % cmd.data)

if cmd.data['command']=='lighton':

print("LIGHT ON")

elif cmd.data['command'] == 'lightoff'

print("LIGHT OFF")

try:

deviceOptions = {"org": organization, "type": deviceType, "id": deviceId, "auth-method": authMethod, "auth-token": authToken}

deviceCli = ibmiotf.device.Client(deviceOptions)

#..............................................

except Exception as e:

print("Caught exception connecting device: %s" % str(e))

sys.exit()

deviceCli.connect()

while True:

T=81

V=500

Vol=240

#Send Temperature & Humidity to IBM Watson

data = {"d":{ 'Temperature' : T, 'Vibrations': V ,'Voltage' : Vol}}

#print data

def myOnPublishCallback():

print ("Published Temperature = %s C" % T, "Vibrations = %s C" % V, "Voltage = %s %%" %Vol, "to IBM Watson")

success = deviceCli.publishEvent("event", "json", data, qos=0, on\_publish=myOnPublishCallback)

if not success:

print("Not connected to IoTF")

time.sleep(1)

deviceCli.commandCallback = myCommandCallback

# Disconnect the device and application from the cloud

deviceCli.disconnect()