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Smart Manufacturing using IOT

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***Abstract*—**We are entering a new era of computing technology that many are calling the Internet of Things (IoT).Machine to machine, machine to infrastructure, machine to environment, the Internet of Everything, the Internet of Intelligent Things, intelligent systems–call it what you want, but it's happening, and its potential is huge. We see the IoT as billions of smart, connected "things" (a sort of "universal global neural network" in the cloud) that will encompass every aspect of our lives, and its foundation is the intelligence that embedded processing provides. The IoT is comprised of smart machines interacting and communicating with other machines, objects, environments and infrastructures. As a result, huge volumes of data are being generated, and that data is being processed into useful actions that can "command and control" things to make our lives much easier and saferand to reduce our impact on the environment. The creativity of this new era is boundless, with amazing potential to improve our lives.

Keywords- *IoT, Manufacturing process, aurdino, sensors, wifi.*

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I. INTRODUCTION

In today's world manufacturing a product is a major task, but production techniques used are orthodox systems. These systems require constant human monitoring and involvement. It is not possible every time that the human senses will detect the errors and faults in the product. This will automatically have an adverse effect on the quality of the product. It also reduces the production rate and increases the cost of production. For example, human senses cannot detect the perfect quality of the raw material used for manufacturing, there might be some error in the material which is not recognized by the human senses. This will make the speed of production slower and increase the cost of production. So, sensors play an important role to remove such faults. So, the idea of the project is to improve the manufacturing process. Improve the quality of the product. Increase the speed of production. Reduce the cost required for manufacturing. Also minimize the involvement of humans on production line.

II. LITERATURE SURVEY

Recent researches have contributed to the development in the area of IoT through this paper we have brief idea of a project which is to develop a smart manufacturing process making the use of IoT. In our literature survey we have referred and studied different research papers regarding the basic concept of IoT, Manufacturing process and production line of the product.

Using IoT in various fields to connect things, services and people for intelligent operations is a trend now a days in latest technology. We have gathered information about new technologies in IoT. Since this new trend has been given such importance and automation in industrial manufacturing is growing faster we have decided to work further on this project.

III. SYSTEM REQUIREMENT

A. Sofware Requiremens:

Platform :

i. Operating System: Windows, Android 4.0
ii. IDE: Arduino IDE, Android IDE
iii. Programming Language: C, C++, Java
iv. Databases: SQLite

B. Hardware requirements:

i. Arduino UNO
ii. P.H. Detector
iii. P.I.R, Color, Force ,Thermal, Temperature and HumiditySensors
iv. Automatic Watering System
v. Wi-Fi Module
vi. Power Supply
vii. Bread Board
viii. Jumper Wires
ix. SDK Module
x. GSM Module

IV. METHODOLOGY

A. Procedure

1. Take sensor readings.
2. Store the readings and check with standards.
3. Give results with respect to the standard values.

4. Whether to approve the raw material or reject the raw material.
5. Rejected raw material go back to the raw material dealer.
6. Approved raw material goes for further processing. 7. After the product is made and packaged, again use sensors to check whether the product made is a standard product. 8. Transfer all the data to machine and phone app.

B. Methods

1. Quality Check:
   The raw materials will be checked for the quality. By various parameters I will be examined. Taking every point of view in mind the raw material will be checked. For example, checking the humidity in a substance, checking its color or even checking the weight after packaging.
2. Application of Sensors:
   Various sensors will be applied in our project. The description of each sensor is described in this journal as well. By using these sensors all the quality checks will be performed in the raw material
3. Storing the Data in Database:
   For further operations on the data the data needs to be stored first. So this data then will be stored in a database and then will be referred to from the database.
4. Comparing Values in Database to Standard Values:
   The data stored in the database is then compared to the standard values and then it is decided whether the raw material should be approved or should be rejected
5. Checking Product After Manufacturing:
   The manufactured product is then checked using sensors and the data then goes to the database.
6. Comparing these Values to the Standard Values:
   Again, these values which are stored in the database are checked with standard values and the product is approved or rejected. If the product is rejected it is re-manufactured. This process continues till the product is approved and if approved it goes into the market.
7. Sending Data to the Application:
   Each and every data collected and compared should be shown in the application on the phone. And also the comparison with different standard values should be shown on the application on the smart phone.

C. Outcomes

Outcome of the project is to develop a manufacturing system which enhances the performance of the manufacturing process. This system will also reduce human efforts and minimize the errors which might be faced by humans.

V. SYSTEM ARCHITECTURE

Fig. 1.1 Proposed System Architecture

a) This system is combining the internet of things and manufacturing process. To make manufacturing process more efficient for use and improve the product quality.
b) We are making use of various sensors for monitoring the manufacturing product step by step and check for various parameters related to the products and the raw materials used for a product. (c) Making use of sensors will reduce human efforts for testing product through out the manufacturing line and ultimately make manufacturing system automated. Through this all the product are tracked till the end i.e. till the delivery of the product. So only single man can get details about any product through app from anywhere.

VI. ALGORITHM

Manufacturing using IoT

We are using sensor hardware and application software to build an automated system for smart manufacturing or goods using IoT.

STEP 1: Testing raw materials
Scan various parameters using sensors.
Transfer values to database
Compare standard values to scanned values
Approve or reject raw material.
STEP 2: Manufacturing Process
Making raw material ready for production
Manufacturing process
Send for testing
STEP 3: Testing of product
Scan temperature humidity and other parameters of the product using sensor.
Compare with standard values
Analysis

Approve or reject the product
Send for packaging

STEP 4: Packaging

Package the product.

STEP 5: Package testing:

Final packaged product testing using sensor
Approve or reject product after verifying it

VIII. FUTURE SCOPE

- Increased Automated Systems.
- Better Efficiency.
- Reduced Manpower.
- Reduced Margin of error.

IX. CONCLUSION

Thus, we have completed a field survey of 2 industries successfully. Now, we are trying to develop a Smart Manufacturing System using IOT which is beneficial for industrial purposes.

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