INSPECTION AND CONTROLLING IN INDUSTRY USING SENSOR TECHNOLOGY

Uzma, Narendra Singh Pal, Shrishti, Vaibhav Anand
Department of Electronics and Communication,
Moradabad Institute of Technology, Moradabad, India

ABSTRACT

Automation is the advanced step of Mechanization which makes use of high control capability devices for efficient manufacturing on production lines. Mechanization needs man power to operate different bulky machines whereas automation involved minimal human assistance computerized technology for the need of high accuracy, quality, precision and performance of Industrial processes.

KEYWORDS: Sensor Technology, real-time data

I. INTRODUCTION

Automation in industry is always a challenging task even a small mistake create a huge loss to industry. We come with an idea that works on the conveyer belt. Conveyer belt are used in industry to transfer bulk material from one place to another. Belt conveyer consists of pulleys using sensor technology which gives acceptable precise result. We as a team working on the project that does inspection and quality control in industry keeping in mind three quality measures i.e. color, shape and weight of any product. It involves Iot (internet of things), real-time data and a mobile application which not only sees the data but control it. Industries using real-time data do present analysis of any product than from coming data and feedback quality control is possible. Checking of color, shape and weight with the help of sensors and making database of it will be helpful in further inspection. Handling is done by servo motors which work as the robotic arm of our conveyer belt controlled by mobile applications. Accept and Reject button operate the robotic arm. Text to speech conversion confirms the product is accepted or rejected.

II. LITERATURE REVIEW

According to [1] real time systems are considering as the heart of industrial automation applications and time response mechanism is required to implement such systems. The requirement of real-time systems provides us a deterministic response to real world events. Different approaches like event-base execution approach which says that only functional blocks are activated when required and service-oriented approach on the other hand says that programming of functional units should be simple. According to [2] use of wireless sensor networks (WSNs) is helpful in increasing productivity of industrial operations. Remote control systems of smart application mainly consist of two parts: Household internal control made an account login and information matching settings to add the security of the systems. According to [11] developed software for a particular task in industry should be less complicated and quick response should be made. System maintenance should be done in such a way that can reduce overall maintenance cost.

III.   EXPERIMENT

Stage 1: To recognize Color
- We are going to use TCS3200 color sensor.
- The output of TCS3200 gives to Arduino UNO digital pin.
- Based on our programming we are going to high one digital pin of Arduino which gives to our L293d motor driver module.
- This starts our conveyer belt.

Stage 2: Inspection of weight using HX711 load cell and amplifier
- For weight HX711 load cell amplifier and load cell.
- When product moves further on conveyer belt its weight being checked by load cell
- Than signal is amplified using Hx711 amplifier.
- All the data is send to Arduino nano microcontroller and displayed on LCD 12C display
- All the data is compared with real time database.
- Than data is send to our application.

Stage 3: Inspection of shape using Ultrasonic sensor HCSR04
- Product further moves on conveyer belt the shape of the product is measured using ultrasonic sensor.
- The data is processed by Esp8266 and then it is send to firebase database.
- Real time data is then send to mobile application.

Stage 4: Controlling robotic arm using Mobile Application
- According to data coming from firebase database a button being made on mobile application.
- For rejecting and accepting of product.
- Text to speech conversion confirms the product is accepted or rejected.

IV.   COMMUNICATION WITH FIREBASE

• While communicating with Firebase we downloaded following library (in references) for my programming under Firebase.

• There we create 'my project' which we have to perform using Firebase Database. We work under real-time database and then my making application using MIT- App inventor we connect my Database with Application.
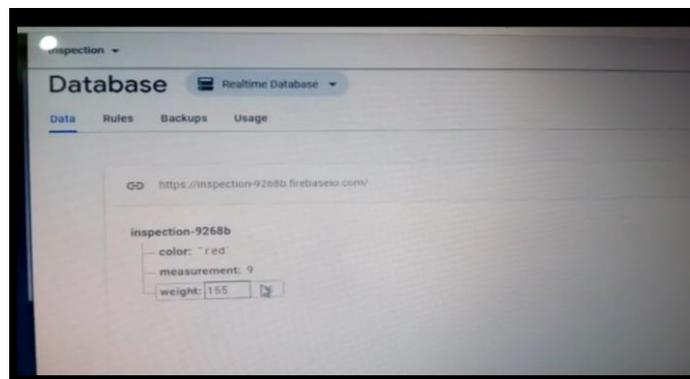

Figure 1 real time database

V.   RESULTS AND DISCUSSION

In previous working conditions of industries we required huge no. of labours for inspection and controlling of products. We were facing several problems some of them are listed below: Huge no. of labour was required thus, increasing labour cost .Increased time consumption for production due to man power, Accuracy decreased due to human intervention,. Required continuous supervision of

product, less secured, Manual routine checkups were required which is also very time consuming. Through our project we can achieve the following:

- To increase productivity.
- To provide optimum cost of operation.
- To improve product quality.
- To reduce routine checks.
- To raise the level of safety

The Internet of Things hasn't just made operations more efficient. It's also helping businesses cut down on operational costs, making workplaces and homes safer and more comfortable than ever and with the use of android app we can do the supervision any time anywhere.
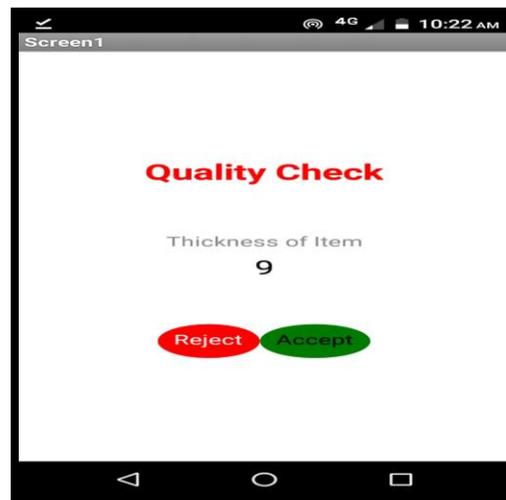

Figure 2 conveyer belt and robotic arm

Figure 3 App development

VI. CONCLUSION

The purpose of automated system on conveyer belt is to perform work more efficiently and accurately. The inspection which is done by sensors give precise results, Iot (internet of things) helps to transfer data wherever in the world and application may have access of controlling it. Automation is the present and future of industry and cost effective technologies helps small scale industries setup too.

VII. FUTURE SCOPE

The inspection and controlling in industry using sensor technology is quite efficient & accurate. It has increased productivity. It is quite cheaper than the existing automation techniques hence it is

grooming technology. Industrial instrumentation and controls has always been a hotbed of new products — improved sensors, amplifiers, displays, recorders, control elements which is grooming**.**

REFERENCES

[1] Vicent Rutangangibwa and Babu Krishnamurthy, "A Survey on the Implementation of Real-time systems for Industrial Automation Applications," Volume 1,Issue7,December 2014 IJIRST.

[2] Minal Nikose, Pratibha Mishra and Avinash Agarwal, "A review on InIndustrial Automation By Zigbee based Wireless Remote Controller" Volume 3,Issue-4,April 204 IJSTR.

[3] Simon Monk, "Programming Arduino" *8 November,2011*

[4] Jeremy Blum, "Exploring Arduino: Tools and Techniques for Engineering Wizardry",*2002*

[5] Aravind Reghu and John Vetelino, "Introduction to Sensors,"2 August,2010

[6] Hiroto Yasuura, Yongpan Liu, "Smart Sensors and Systems: Innovations for Medical, Environmental, and IoT Applications,"13 July,2015.

[7] Catalin Batrinu," ESP8266 Home Automation Projects: Leverage the Power of this Tiny WiFi Chip to Build Exciting Smart Home Projects," 28 November,2017.

[8] Marco Schwartz, "Internet of Things with ESP8266," 29 July,2016.

[9] Houssem Yahiaoui, "Firebase Cookbook," 29 November,2017.

[10] Ashok Kumar S, "Mastering Firebase for android development," 29 June,2018.

[11] Rajiv Suman, Sushil Kumar Choudhary and Pooja Preet, "Computer Govern Maintenance System for a Process Industry," Volume 5,No.3 ,2014 IISTE.

[12] Kourosh Kalantar-Zadeh, "Sensors: An Introductory Course,"20 March,2013.

[13] Clarence W. De Silva, "Sensors and Actuators," 1991.

[14] Lyra Logan, "Learn to Program with App Invento," 2019.

[15] Jörg H. Kloss, "Android Apps with App Inventor," 2012.