



IOT BASED SMART SORTING MACHINE SYSTEM

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1. ABSTRACT: -This paper presents an IoT-based smart sorting machine designed to automatically classify objects based on colour, size, or type using sensors and microcontrollers. The system integrates IoT technology to monitor and control sorting operations remotely. Sensors detect object properties, and a controller processes the data to actuate motors for sorting. The system improves efficiency, reduces manual labor, and ensures accurate sorting in industries such as agriculture, manufacturing, and recycling. Real-time monitoring and data logging enhance productivity and decision-making.

Keywords: IoT, Smart Sorting, Arduino, Sensors, Automation, Conveyor Belt.

2. INTRODUCTION: -Automation plays a crucial role in modern industries. Traditional sorting methods are time-consuming and prone to human error. An IoT-based smart sorting machine provides an efficient and automated solution. This system uses sensors to detect object characteristics and sorts them automatically using actuators. IoT connectivity allows remote monitoring and control, making the system intelligent and efficient.

❖ overview of smart sorting system

Smart sorting systems are used in industries for separating objects based on parameters like:

- Colour
- Size
- Weight
- Material

Applications include:

- Agriculture (fruit sorting)
- Recycling plants
- Manufacturing industries

3. LITERATURE REVIEW: -Existing systems use manual or semi-automatic sorting techniques which have limitations:

- Low accuracy
- High labor cost
- Time-consuming process

Recent IoT-based systems improve efficiency by:

- Using sensors for detection
- Automating sorting process
- Providing real-time monitoring

4.METHODOLOGY

4.1. SYSTEM ARCHITECTURE

The system architecture consists of input sensors, a processing unit, output actuators, and IoT connectivity.

4.2. HARDWARE DESIGN

A. Microcontroller (Arduino / Node MCU)

The microcontroller acts as the brain of the system. It processes sensor data and controls actuators based on predefined logic



Fig 4.2.A:- Arduino UNO

B. Servo Motor

Used to divert objects into different bins based on sorting criteria.



Fig 4.2.B:- Servo motor

C. Conveyor Belt

Provides continuous movement of objects through the system.



Fig 4.2.C:- conveyor belt

D. Power Supply

Supplies electrical power to all components.



Fig 4.2.D:- lithium battery

```
s.write(30);  
  
delay(1000);  
  
s.write(90); }}
```

4.3. SOFTWARE AND IMPLEMENTATION

The system is programmed using Arduino IDE. The software performs the following tasks:

- Reading sensor data
- Processing data using decision algorithms
- Controlling motors and actuators
- Sending data to IoT platform

IoT platforms like Blink or Thing Speak are used for real-Monitoring

4.3.1. Arduino code c++

```
#include <Servo.h>
```

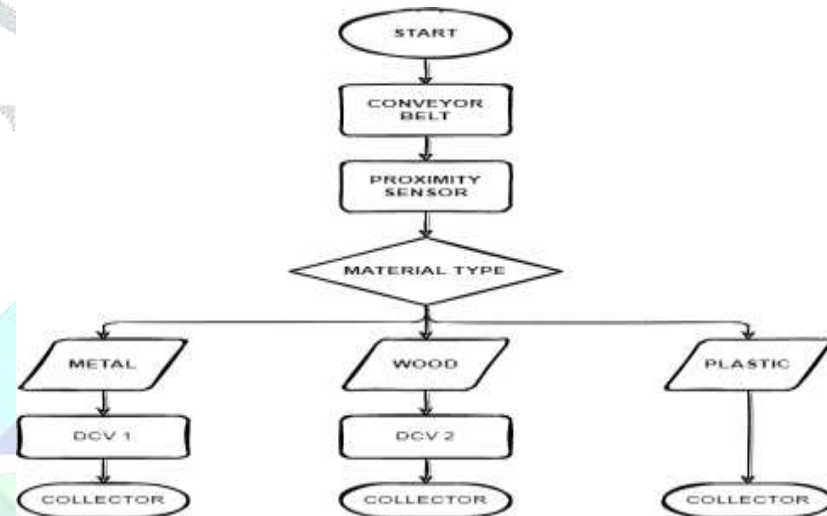
```
Servo s;
```

```
void setup ({ s.attach(9); pinMode(2,INPUT); }
```

```
void loop(){
```

```
if(digitalRead(2)==LOW){
```

.FLOWCHART



4.4. WORKING PRINCIPLE

The ..working of the system is as follows:

1. Objects are placed on the conveyor belt
2. IR sensor detects the object
3. Colour sensor analyse object colour
4. Data is sent to microcontroller
5. Controller processes data
6. Servo motor rotates to specific angle
7. Object is sorted into respective bin
8. Data is uploaded to cloud



Fig 4.4.3 D :-automatic colour shorting machine

4.5. APPLICATIONS

- Agriculture (fruit sorting)
- Recycling industries
- Packaging industries
- Manufacturing units

5. CONCLUSION

The IoT-based smart sorting machine provides an efficient and reliable solution for automated sorting. The system enhances productivity, reduces errors, and enables real-time monitoring. It is suitable for various industrial applications and can be further improved with advanced technologies.

6. REFERENCES

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