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IOT based Automatic Colour Sorting Machine

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Abstract *: In our day - to - day life we use wide range of products .The manufacturing and production of these products are done in many small scale and large scale industries. Arranging products manually make quality consistent issue. Nowadays, After manufacturing and production of the products the main difficulties are faced is the sorting of products. Arranging of products in an industry is a poor modern process, which is largely done physically. The machine which is consistent and sort products according to their size, colour, shape and weight etc. are needed in industry which helps in consuming time and human interactions. This paper gives a brief information about how products are sorted according to their containers respectively.*

Keywords – *Internet of Things (IOT), Automation, Sorting Machine, Servo Motor, Raspberry pi4*

1. INTRODUCTION

Industrial processes are well refined with the assistance of automated system thanks to the drawbacks of the manual system .The manual system of sorting objects relies on manpower. Human are highly capable to differentiate objects colours and to sort them. But repeating the identical process may cause irritation and mental stress which might result in certain manual errors like low accuracy, low efficiency, etc. To reduce production time and to extend quality, automated systems are being employed. The proposed system is in a position to sense, sort and count objects supported their colours and to display them on App and stored using Cloud. It transfers the various coloured objects to different containers for several number of times.

1.1 Importance of Project

Automatic colour sorting machine are significantly different from manually colour sorting machine with high flexibility and swiftness in its movement. The automatic colour sorting machine structure design gives an advantages over manually colour sorting machine and also the ability to adapt to industrial requirements so that it can be widely used in industry, industrial testing etc. and special conditions like humans cannot detect colour shades result in increasing attention is paid to automatic colour sorting machine.

1.2 Motivation

The motivation of creating a IOT based automatic colour sorting machine comes from the abilities which a IOT based colour sorting machine possesses in comparison to manually colour sorting machine such as flexibility, adaptability and less human interference .

2. DESIGN METHODOLOGY

2.1 BLOCK DIAGRAM:

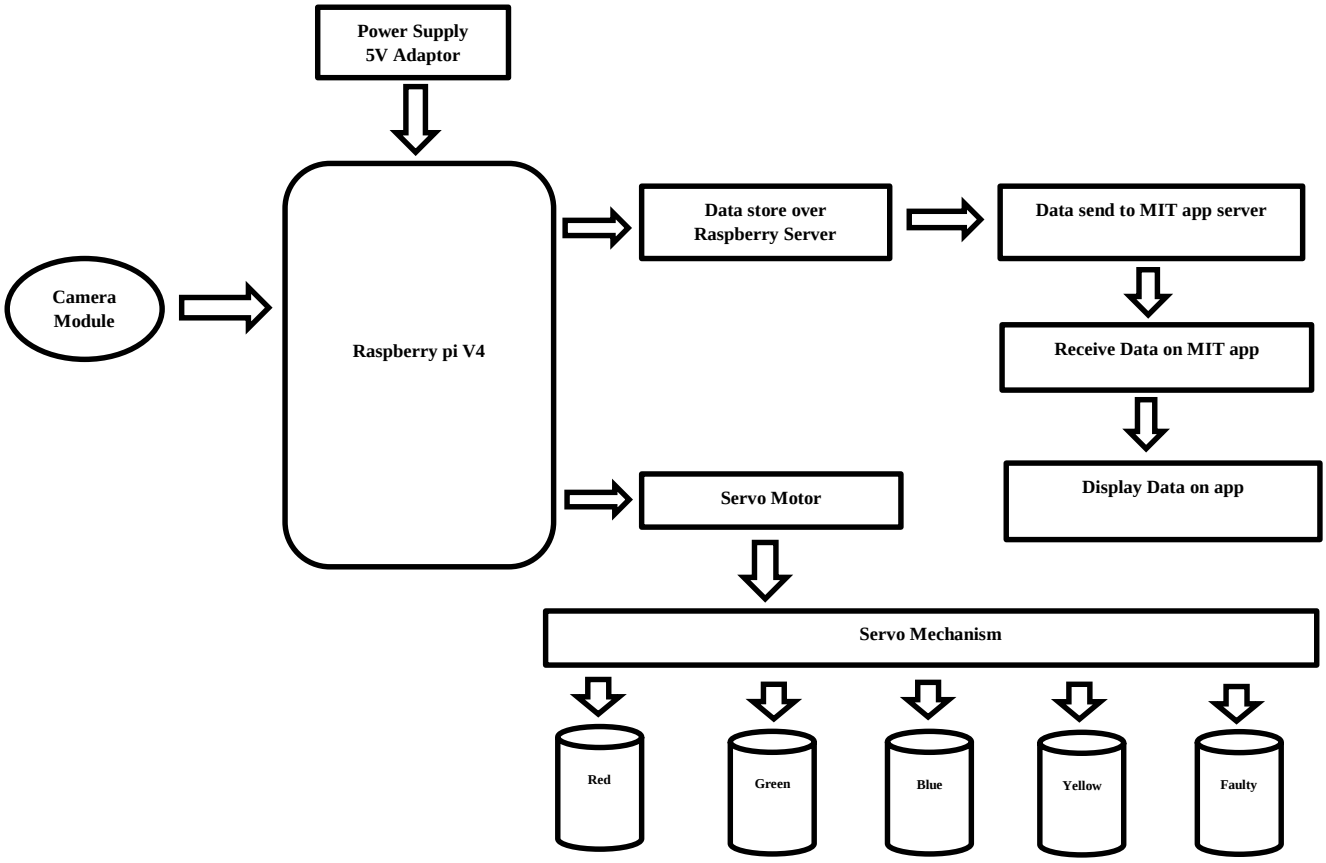

Fig .1 Block diagram

The mechanism is designed with the help of the components like Power supply, Camera Module, Raspberry pi V4 and Servo motor. Power supply provide electric power to the components. The colour sorting mechanism makes use of a camera module to detect the colour and shape of the object. Raspberry pi is used to store the data received from the camera module and to give the commands to the camera module and servo motor. Data store over Raspberry pi server is send to the MIT app server. And through the MIT app data is received from the MIT server and then data is displayed on the app. The mechanism make use of servo motor to carry the object to the container making overall mechanism technically advanced and futuristic.

2.2 Flowchart:

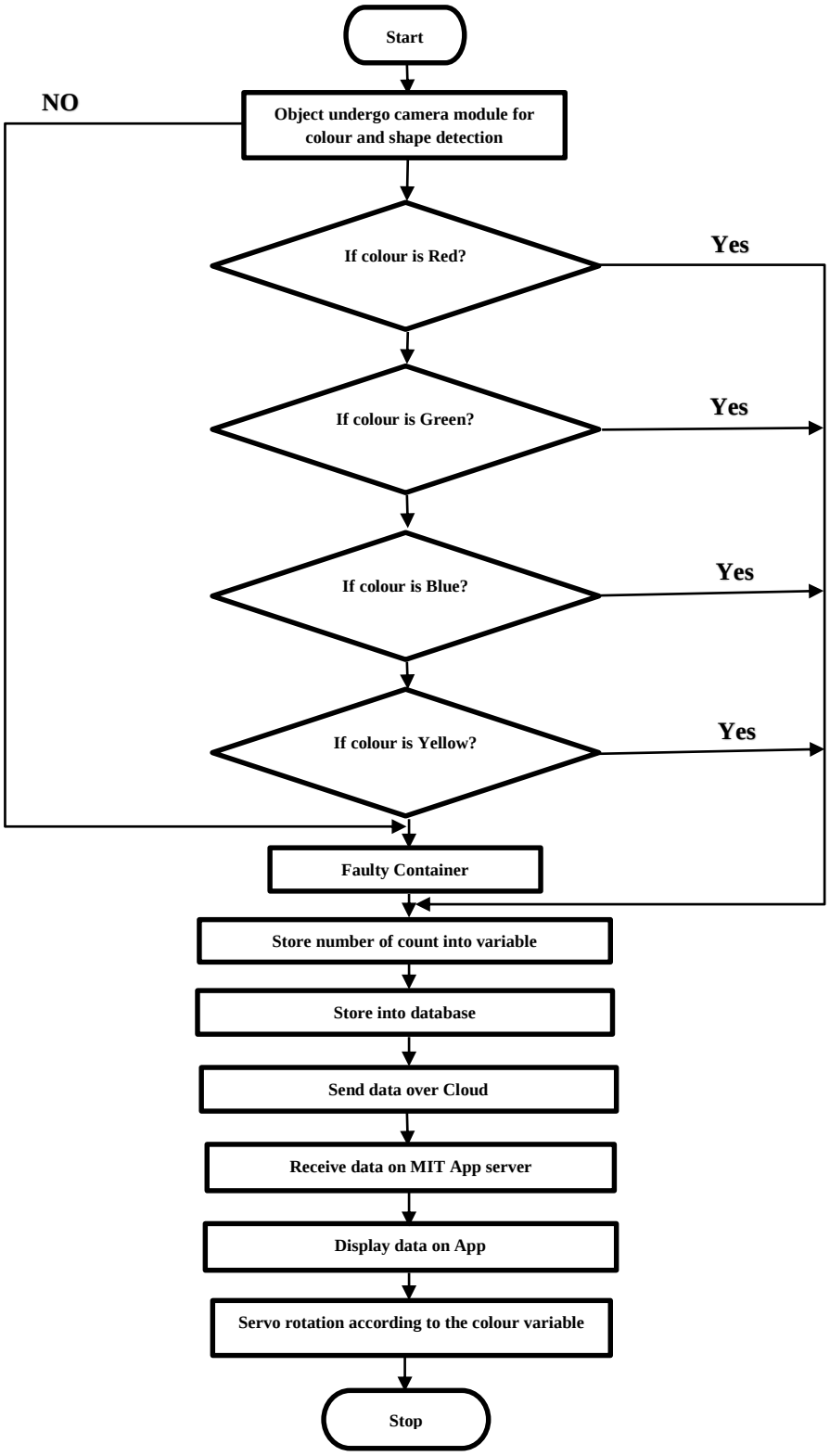

Fig.2 Flowchart

The starting process of IOT based colour sorting machine is described by the flowchart in the Fig. where the firstly object undergoes the camera module for colour and shape detection. If the shape does not match to the given data to the machine then it will go directly to the faulty container through servo motor. And if the shape matches to the

given data then the colour sorting begins. If the colour of the object matches to the given data, the object is counted. And it store the count into variable then it is stored in database. Data is send over cloud then data is received on MIT app server. And then data is displayed on app. Then servo motor makes rotation according to the colour variable. And if the colour of the object does not matches to the given data then it will go directly into faulty container through servo motor.

2.3 Working:

The Object will be poured into hopper which will load candies to the tube. As object passes from front of camera, it captures the image and raspberry pi will perform image processing on that image to detect the colour of that candies.

Image processing steps:

1. RGBY channel of image will be separated in the algorithm will check the Intensity of different channel.
2. Colour label will be attached according to highest intensity in the spectrum.

The container for different colour object are placed on either side of the tube and servo motor is placed in front of the tube. Depending upon the colour detected flap attach on stepper motor will kick out, the last object from the row and throws into respective container. If object found to be defected it will be thrown out in the other container through the flap of stepper motor. As candies are sorted into respective of their colour, they can be packed.

The MIT application is used to get details on the colour count etc. and to give update on maintenance.

3. RESULT AND DISCUSSION

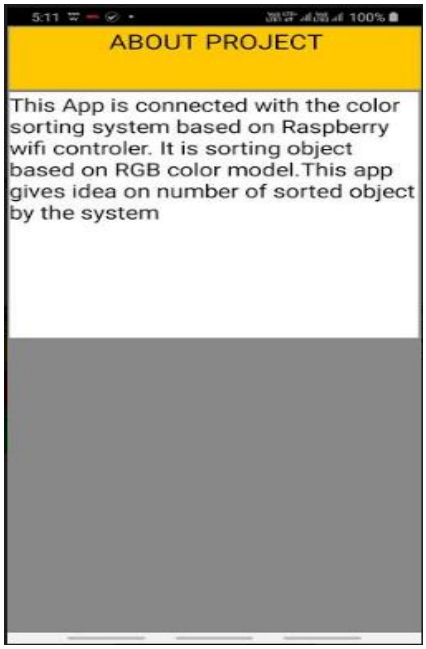

Fig. 3 Introduction to project

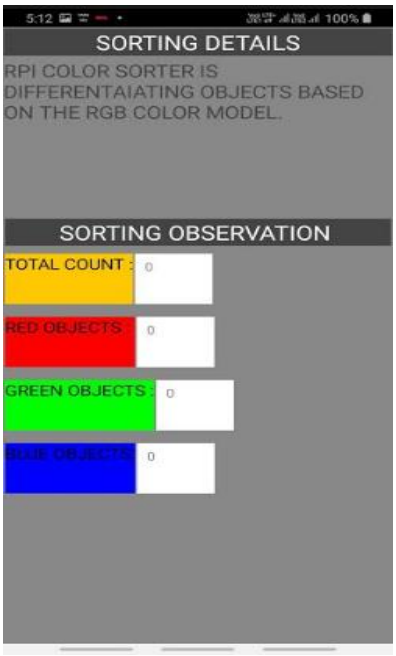

Fig. 4 Segregation of object based on colour

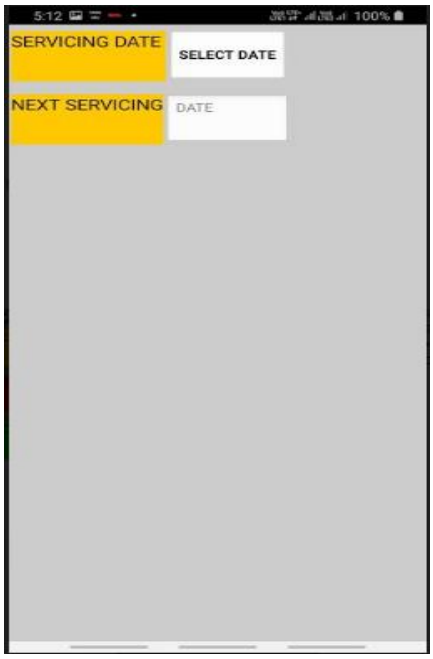

Fig. 5 Maintenance details

The Expected results of our project is that the colour sorting machine will sort colour object according to the colour and shape and pass it to the container through the servo motor and flap. And through Wi-Fi module data is send to mobile application and mobile application also gives updates on maintenance of the machine.

4. CONCLUSION

It gives expense effective, taking less time and technically the simplest way for differentiating objects. This framework utilizes Raspberry pi which makes this model simple to utilize which is more additional effective. The main failure are going to be caused if the sensing of object consistent with color isn't done. Therefore, it is very important to have proper and checked sensors. Another we have used image processing for capture object color and sort according to their container. Further, making desirable changes it can be used in small scale and large scale industries as well. Fast working process, that's why we can consume time. No errors like counting mistakes, it gives accurate reading. Good repeatability. Reduce labor cost in industrial sector. Less human interference, automatic done work.

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