**IOT(Internet Of Things)**

**Project: Warehouse Management using RFID**

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**1.INTRODUCTION:**

**1.1 Overview**

Warehouse management systems will make your warehouse or distribution center more efficient, accurate, and connected. Using a combination of process, people, and technology, our warehouse solutions streamline all functional areas, including: receiving, put-away, picking, packing, shipping, and cycle counting.

Acting as your warehouse command center, a Warehouse Management System (or WMS platform) enables agile, real-time management. By partnering with the best in WMS, Barcoding, Inc. offers platforms that fit the needs of distribution centers of all sizes.

**1.2 Purpose**

The Warehouse Management System based on RFID will help to improve the efficiency of warehouse management, and make rapid self-recording of receiving and delivery.

**2.LITERATURE SURVEY:**

**2.1 Existing Problem**

1.Time consuming to note the data of every package.

2.Cluster of packages.

3.Confusion among the packages.

**2.2 Proposed Solution**

The proposed system consists of some phases:

1.Giving RFID tags to the packages.

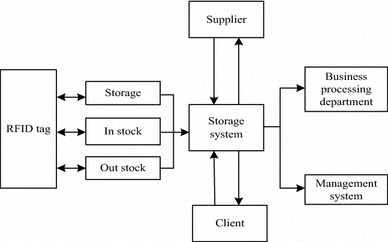
2.Reading and categorizing packages according to the RFID.

3.Storing data and arranging the packages according to their categories.

* Prevents under-stocking or overstocking AND improves security.
* More information capability, such as tracking and tracing, keeping consumers, retail partners and other supply chain partners lifetime updated.
* Reduced labour costs, as RFID tags automatically generate and report information when scanned.
* No line-of-sight (like barcode) requirements to track or scan.
* Improved visibility across your supply chain due to maximal information processing and lead capture.
* Increased longevity and less damage through processes due to hardy construction.
* Scans more, faster, than even the best handheld barcode scanners.

**3.THEORITICAL ANALYSIS :**

**3.1 Block Diagram**

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**3.2 Hardware/Software designing**

**Software Designing:**

The software used for smart parking system is:

a. Python

b. IOT Open Hardware platforms

c. IOT Cloud Platform

d. IOT Communication Technologies

e. IOT Communication Protocols

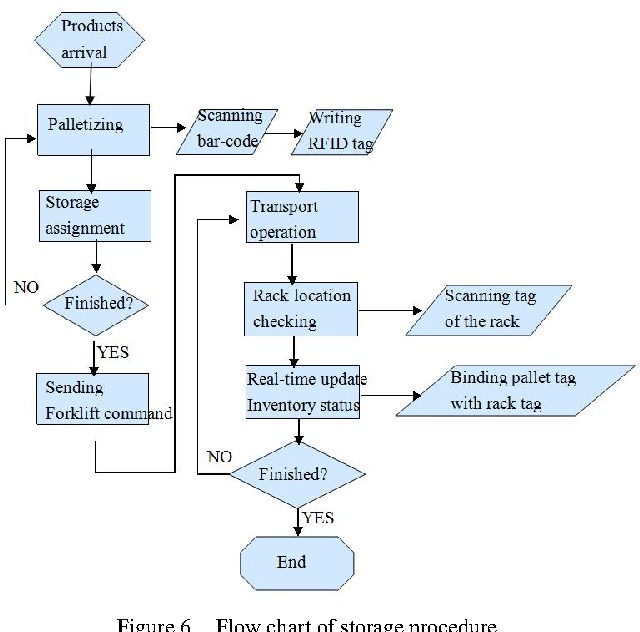
**4.EXPERIMENTAL INVESTIGATION :**

*The Internet of things (IoT) is a system of interrelated computing devices, mechanical and digital machines provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. The definition of the Internet of things has evolved due to the convergence of multiple technologies, real-time analytics, machine learning, commodity sensors, and embedded systems.*

*The IoT can assist in the integration of communications, control, and information processing across various transportation systems. Application of the IoT extends to all aspects of transportation systems (i.e. the vehicle, the infrastructure, and the driver or user). Dynamic interaction between these components of a transport system enables inter- and intra-vehicular communication, smart traffic control, smart parking, electronic toll collection systems, vehicle control, safety, and road assistance. For example, an IoT platform can continuously monitor the location and vacancies of spaces in parking.*

*This can only be possible with the IoT and its seamless connectivity among devices. Sensors such as GPS, Humidity, and Temperature send data to the IoT platform and then the data is ANALYSED and then sent to the users. This way, users can track the real-time status of vehicles and can make appropriate decisions. The smart parking system is an IOT based device which is capable of automatic sensing of vehicles. ALSO, the data of sensors will be displayed in graphical form on the IBM cloud page.*

**5.FLOWCHART:**

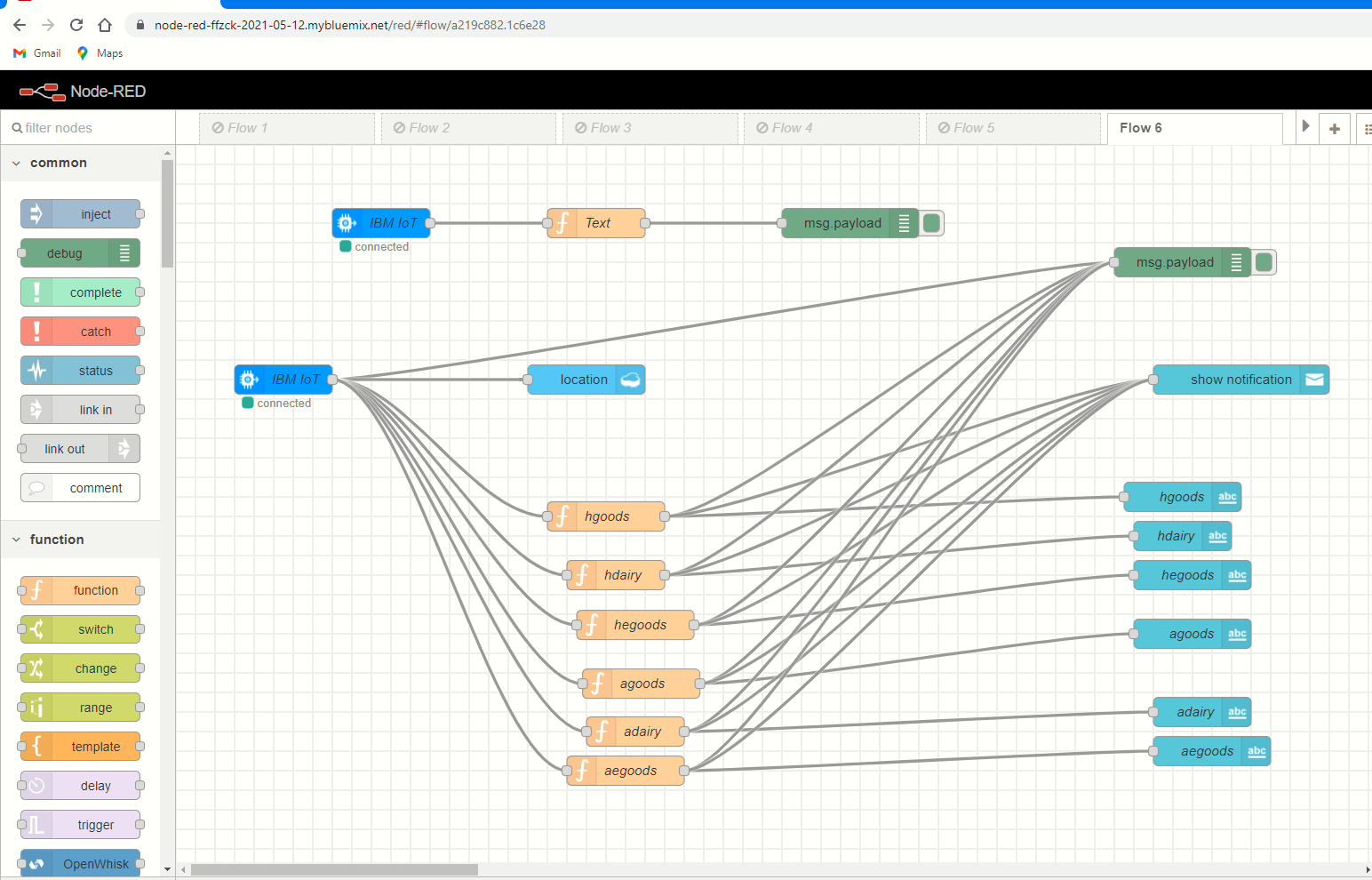
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**6.RESULT :**

**Python code:**



**Node-red:**



**Data stored in Cloud database:**

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**7.ADVANTAGES AND DISADVANTAGES :**

**Advantages :**

* Reduced Labor Costs.
* No Line-of-Sight Requirements
* Improves Visibility.
* Contains More Information.
* Scans More Items, Faster.
* Less Susceptible to Damage.
* Prevents Overstocking and Understocking.

**Disadvantages:**

* Costs Can Be Higher.
* Interference May Cause Problems.
* Upgrading Equipment May Be Necessary.
* RFID May Be Incompatible in Other Countries, DCs or Warehouses.

**8. APPLICATIONS:**

The WMS provides a simple process that is to be followed when handling a shipment that has arrived at the warehouse.

**9.CONCLUSION:**

The warehouse management system (WMS) based on RFID can collect, transfer, check, and update mass data on daily frequent goods entry and delivery, thus the labor intensity will be decreased, errors like fault scanning, miss scanning, re-scanning in the repeating manual operations can also be avoided. It improves efficiency and accuracy. With development of the RFID technology, reduction of costs, gradual unification of the standards, decrease of the error rate, the effective combination of WMS and RFID will become one of the key factors to improve the competitive power of enterprises and the efficiency of the supply chain.

About IAITO INFOTECH PVT LTD (ISO 9001:2008 certified) an incubate company of IIT Kanpur provides state of the art integrated traceability, identification and authentication solutions. It provides software as well as integrated turnkey solutions of both(hardware, software & services) in various technologies like RFID, NFC, GPS, Mobile technologies etc. With the knowledge of experienced professionals, we are able to help you to deploy the right combination of technology that will maximize your ROI right from the start and ensure its expandability as the application grows through the evolution of the technology. With our R & D experienced team, we have developed different integrated solutions for various industries and carry one of the most comprehensive product/solutions. IAITO’s turnkey solutions model covers industries like Aviation, Manufacturing, Transportation, Retail, Government, Renewable Energy, BFSI and Mining.

**10.FUTURE SCOPE:**

The **warehouse** of the **future** will take advantage of automated capacity **management** by leveraging technology for better, data-driven capacity planning. The result is fewer capacity planning errors that can lead to lost revenue and improved space utilization, which translates to a healthier bottom line.

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**12.APPENDIX:**

**a.Source Code:**

import wiotp.sdk.device

import time

import random

import cv2

import numpy as np

from pyzbar.pyzbar import decode

myConfig = {

"identity": {

"orgId": "kbfeya",#place you're crednetials

"typeId": "IOTDEVICE",

"deviceId":"1010"

},

"auth": {

"token": "07\_13\*11&83"

}

}

def myCommandCallback(cmd):

print("Message received from IBM IoT Platform: %s" % cmd.data['command'])

m=cmd.data['command']

client = wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)

client.connect()

cap = cv2.VideoCapture(0)

cap.set(3,640) #width of the frames in the video feed

cap.set(4,480) #height of the frames in the video feed

global hdairy,hegoods,hgoods,adairy,aegoods,agoods

hdairy=0

hegoods=0

hgoods=0

adairy=0

aegoods=0

agoods=0

while True:

ret,img = cap.read()

for barcode in decode(img):

mydata = barcode.data.decode('utf-8')

print(mydata)

if(mydata.count("Hyderabad")>=1):

hgoods=hgoods+1

print("the number of goods for Hyderabad are ",hgoods)

if(mydata.count("dairy-products")>=1):

hdairy=hdairy+1

print("the number of Dairy products for Hyderabad are ",hdairy)

elif(mydata.count("electronic goods")>=1):

hegoods=hegoods+1

print("the number of Electronic goods for Hyderabad are ",hegoods)

if(mydata.count("Adilabad")>=1):

agoods=agoods+1

print("the number of goods for Adilabad are ",agoods)

if(mydata.count("dairy-products")>=1):

adairy=adairy+1

print("the number of Dairy products for Adilabad are ",adairy)

elif(mydata.count("electronic-goods")>=1):

aegoods=aegoods+1

print("the number of Electronic goods for Adilabad are ",aegoods)

pts = np.array([barcode.polygon],np.int32)

pts.reshape((-1,1,2))

cv2.polylines(img,[pts],True,(0,0,255),5)

pts2 = barcode.rect

cv2.putText(img,mydata,(pts2[0],pts2[1]),cv2.FONT\_HERSHEY\_SIMPLEX,1.2,(0,255,255),3)

cv2.imshow('rfid-scanner',img)

cv2.waitKey(1)

myData={'hgoods':hgoods,'hdairy':hdairy,'hegoods':hegoods,'agoods':agoods,'adairy':adairy,'aegoods':aegoods }

client.publishEvent(eventId="status", msgFormat="json", data=myData, qos=0, onPublish=None)

print("Published data Successfully: %s", mydata)

client.commandCallback = myCommandCallback

time.sleep(2)

cv2.destroyAllWindows()

client.disconnect()

**B. UI Output:**

