INVENTORY MANAGEMENT SYSTEM USING QR CODE

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Abstract: Tracking your assets should be one of your several business priorities. To get the most out of your fixed assets, you must at all times be in the know about the history of your assets. To collect and analyse info you need an asset tracking system in place. The traditional way of tracking assets involves using barcodes, which is still popular, however, many businesses now use QR code inventory management software. As hard as it may be for you to believe, QR codes were invented for asset tracking and not marketing. You can use a smartphone or a handheld scanner to scan QR codes. That said, only scanners that can read both 1D and 2D barcodes QR codes.

Keywords: Barcode scanner, Inventory management system, QR Code, ZXing library.

I. INTRODUCTION

QR Inventory is lightweight, yet powerful inventory management system that uses QR codes, NFC and mobile technology to streamline inventory management process for small businesses. Use smartphones to efficiently check in, check out and lookup inventory by scanning QR codes, regular UPC barcodes or NFC tags. No bulky proprietary scanners are required - no matter how many people in your organization are involved in handling inventory, they all have scanners in their pockets[1].

Process high volume asset and inventory transactions fast using NFC technology - and a smartphone. NFC technology allows for much more efficient assets and inventory processing and does not require purchase of the extra hardware.

Access accurate real-time inventory status, location and other details from anywhere - use smartphones, tablets or desktop

computer for inventory lookup, details and reports. Choose what you want to record / track for your inventory. Control the fields via the web interface - and these fields will appear on the smartphones for your employees to fill out when inventory goes in or out. It can be anything: from inventory location in the warehouse to expiration date to projects where inventory is used.

Never run out of inventory - set re-order points and receive low inventory alerts. Check reports on inventory usage, identify trends, and break down inventory by trackable fields: see how many items are at a specific location, how many are on hands, how many were used for project A and project B, how many will expire next month, etc[2].

QR codes or Quick Response codes are 2-dimensional barcodes that include black and white squares. QR codes can accommodate more data than barcodes. A conventional QR code can store up to 4,296 characters including punctuation marks, words and phrases, and special characters or 7,089 digits. Adding more data to the QR code increases its complexity and size. QR codes can include binary data such as small images. To ensure readability is not affected in case the QR code gets damaged, data keys include duplications.

The QR codes that we have incorporated can be used as a means to identify the travel booking details that have been booked by a particular person. The QR codes take up minimal space when compared to the 1D barcodes and can also be used as a database. A typical QR code will be able to hold larger amount of information when compared with the 1D bar code. This data can be in the form of binary data, alphanumeric data or numeric data which can hold a maximum of 2953 bytes of information. A small portion of the QR code will be able to contain the error correction information along with the actual data. A major portion of the QR code is used to define the version as well as the data format of the information to ensure proper timing, alignment and positioning. The smallest element or dot in the QR code is called as the module. The area that is surrounding the QR code is ideally empty for about 4 modules wide known as the quiet area. Using proper encoding techniques, examination certificates can also be issued using the QR[3].

CREATING A QR CODE

Creating a QR code is as easy as 1,2,3. All you need to do is visit a website that generates QR codes. Before visiting a QR code generation website, decide what you want to encode (can be the asset serial

number or inventory SKU number). Once you have selected the type of code you want, enter data to get your unique QR code.

Real-time asset tracking

QR codes can be scanned using smartphones, which means your team members won't have to travel to the warehouse every time they want to learn about a particular asset's location. Software that uses QR codes have many benefits over conventional tracking systems. They can help address various issues such as errors that arise due to missed or incorrect documentation of parts and assets. Additionally, QR code inventory management software helps avoid overstocking, understocking, and duplication errors[4].

Help speed up the entire process

Many QR code inventory management software can be connected to the cloud. Data stored in the cloud can be accessed by different teams. When it comes to saving time cloud connectivity can be of great help, especially if your teams spend a lot of time on the floor every day. Your team members won't have to go back to an office every time they want to update records, which helps them update records in real time.

Additionally, QR codes speed up the data entry process which helps save time and avoid errors. When your asset records have fewer errors, you are able to take decisions swiftly.

MOTIVATION

The project which is implemented has helped the shop keepers to avoid the maintenance of stock record book. This project is targeted for a shop which maintains records of gold items in a register, and maintenance of such important information in a register is very crucial for any organization as the register may get into bad condition as and when the time passes. Also, sometimes to find out the information related to any item the worker has to ask it to the owner, which becomes time consuming; and to find and calculate the item rate again they have to do a manual process. So this project simplifies all the problems mentioned above and helps them to carry out their task at a far greater speed. Now the workers can directly scan the QR code which is attached to the item and then can find out all the necessary information related to the item

II.   LITERATURE SURVEY

The conventional 1D barcode system of tracking has already passed and the QR codes have been used fervently due to their

ability to hold a larger amount of data than the conventional 1D. A typical QR code can hold data in both vertical and horizontal direction, indicating its ability to represent information of up to 7089 characters. Moreover, using encoding, QR code will be able to encapsulate the same amount of data as that of the 1D code, but with a space reduction by one-tenth. While using QR code, it is not necessary for the user to scan it using a particular angle. In fact, irrespective of the positioning of the scanner, the QR code can be read conveniently. Even if a partial part of the QR code is tampered with, it is still possible to read the information with the help of error correction, which is not possible in the 1D barcode.

In [5] an analysis of optimising m-commerce network where mobile devices are accessible is conducted. It enables QR-Code based ticket-less web-based booking. These web pages are also accessible in mobile. This system enables access of credit and debit cards to book tickets electronically which will schedule the travel. These are also accessible through mobile devices with the help of internet.

The authors of [6] used physical access methods for authentication are not very secure and are does not have a retrieval of data. Thus, they implemented an efficient QR code-based authentication system which can be accessed with the help of mobile phones. It stores the secret information from the OTP in the form of QR code. They implemented OTP and QR code together because OTP is very secure and QR code stores large amount of information. Therefore, it enhances the security over physical systems.

In [7] the teaching methods of how to use QR code in classrooms are detailed. QR code is an abbreviation of quick response code which is helpful in accessing information from texts, URLs and Links. QR code can be scanned from 360 degrees. By implementing QR code in education it increases the interest among students in latest technologies. This increases education standard. This makes learning possible even outside the classroom.

The study in [8] is based on augmented reality that uses 2D barcode to help students to improve their proficiency in English. This system consists of a data base which contains information regarding English learning which can be accessed using mobile app. A survey was conducted to examine this project and received positive response from students and was proved that it was useful for English language learning.

[9] aims at merging private information into a public QR code to provide data of a

particular context. It decodes and translates the input data based on the language used by the user on their machine. It is a system for booking tickets electronically for public transports. It analyses different viewpoints for developments in e-ticketing platform

Snehal.Kalbhor et al. [10] Today Android mobiles are being used by almost everyone and there are applications designed for almost everything we need in a daily life. But when we see that there are long queues for getting regular local tickets, we get frustrated and huge amount of time gets invested. The ATVM machines are many times out of order. Many people don't know how to use the machine and machines require large amount of maintenance cost. Mobile Application for booking local ticket online is a venture to avoid the current biggest problems that is the queue and machine (ATVM) maintenance cost and even unavailability of the machines. To overcome this problem application will provide users to login and create account in the app so that user can book tickets. User can transfer balance from his respective bank account in his apps. Admins of the application can change the cost of tickets as per the distance or cost per kilometre. Ticket Checker can check the ticket by scanning

the ticket and can also check recent 2 tickets.

Fu-HauHsu et al. [11] In this paper, we propose a reversible visible watermark method, which embeds QR code into gray-scale images to create a visible watermark. Not using complex calculations, this paper tries to simply change the pixel value to achieve the digital watermark. Furthermore, a reversible steganographic method is used to embed the watermarking information, which can be used to recover the original images, into the watermarking images

III. PROPOSED WORK

The Inventory Management System is a real-time inventory database capable of connecting multiple stores. This can be used to track the inventory of a single store, or to manage the delivery of stock between several branches of a larger franchise. However, the system merely records sales and restocking data and provides warning of low stock at any location through email at a specified interval. The goal is to reduce the stress of tracking rather than to holder all store maintenance. Further features may consist of the ability to create reports of sales, but again the explanation is left to the management. In addition, since theft does occasionally occur, the system provides solutions for confirming

the store inventory and for correcting stock quantities. Production unit use inventory management system to reduce their transport costs. The system is used to track products and parts as they are transported from a seller to a storeroom, between storerooms, and finally to a retail location or directly to a customer. Inventory management system is used for various purposes, including:

To overcome the drawbacks and limitations of the existing system, this inventory Management System software is proposed. It is a more efficient web application developed using Java. This application is more effective for stock data management; the data is more secured and can be accessed easily

IMPLANTATION

The inventory management system is the main source to handle the goods which are in processing and for semi processed. This paper is about the Inventory control with the help of QR-Code. Generally, people will use Inventory control with barcode only which makes the work difficult. Some special scanners should be used for scanning the bar code but if the QR-Code is used in theplace of barcode we can scan the code by usingthe smart phone usingany type of the Android and IOS. Hence, this

paper contributes on QR-Code to use efficiently using our proposed model.

MODULES

Manufacture: In this module manufacture will stick product qr on the product box **Vendor** In this module vendor can login into application and he can manage employee like add new employee, view employee and delete employees, and he can view inventory details also **Employee** In this module employee can login into application and he can manage products like add product, view products and update products While adding products he need to scan the product QR.
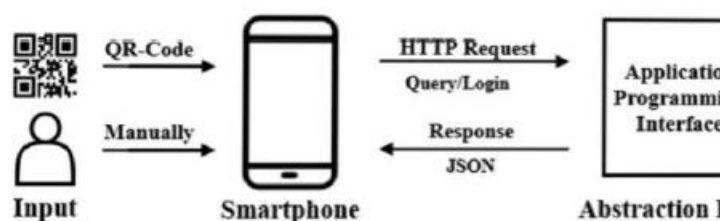
SYSTEM ARCHITECTURE

Fig.1 System architecture

Architectural Design: Django is based on MVT (Model-View-Template) architecture. MVT is a software design pattern for developing a web application. **MVT Structure has the following three parts :**

Model: Model is going to act as the interface of your data. It is responsible for

maintaining data. It is the logical data structure behind the entire application and is represented by a database (generally relational databases such as MySql, Postgres). To check more, visit – Django Models

View: The View is the user interface — what you see in your browser when you render a website. It is represented by HTML/CSS/Javascript and Jinja files. To check more, visit – Django Views.

Template: A template consists of static parts of the desired HTML output as well as some special syntax describing how dynamic content will be inserted. To check more, visit – Django.

IV. RESULTS

This is the first screen which shows up when the system is launched, the screen has two option tabs;
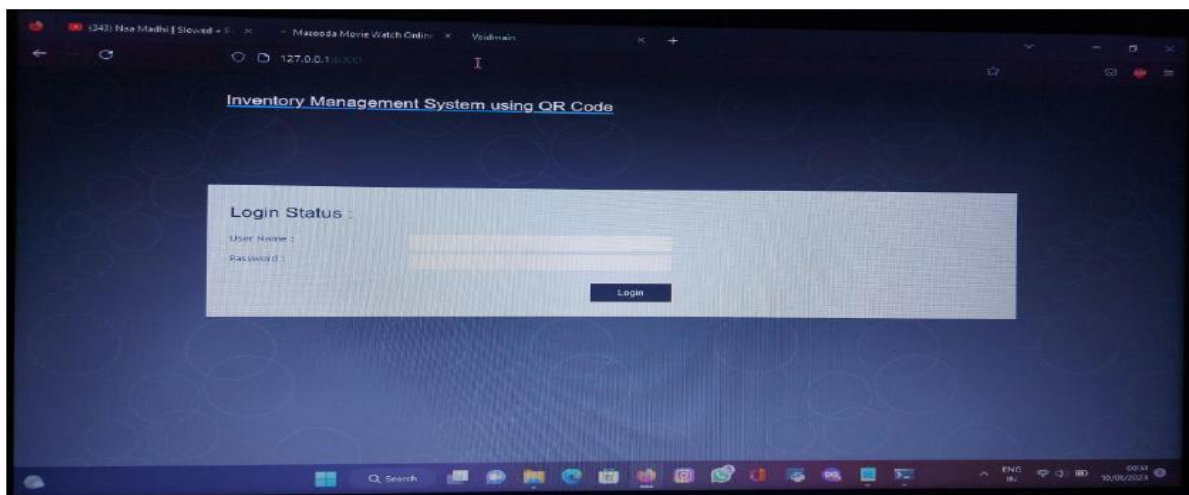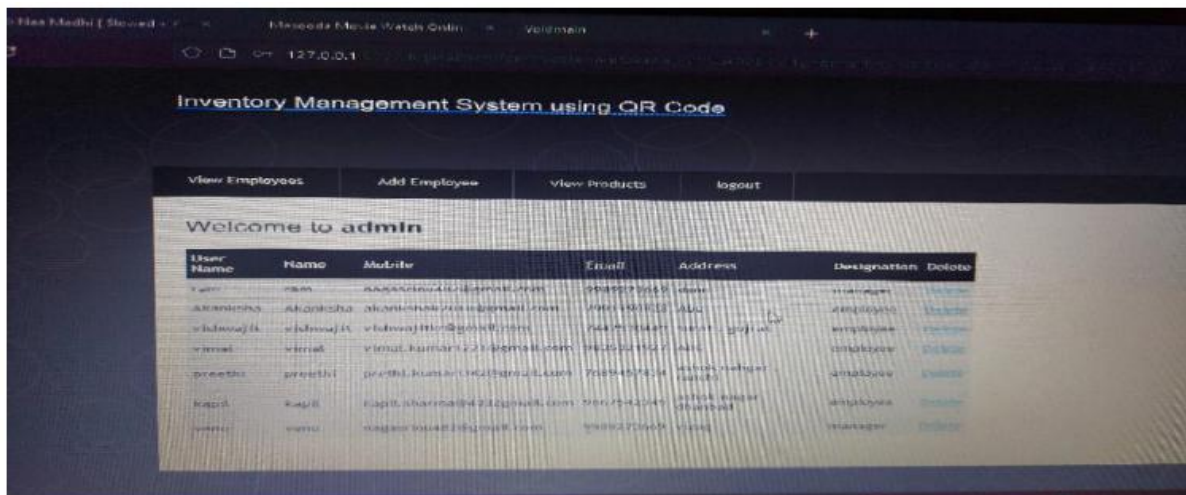
a. Username

b. Password

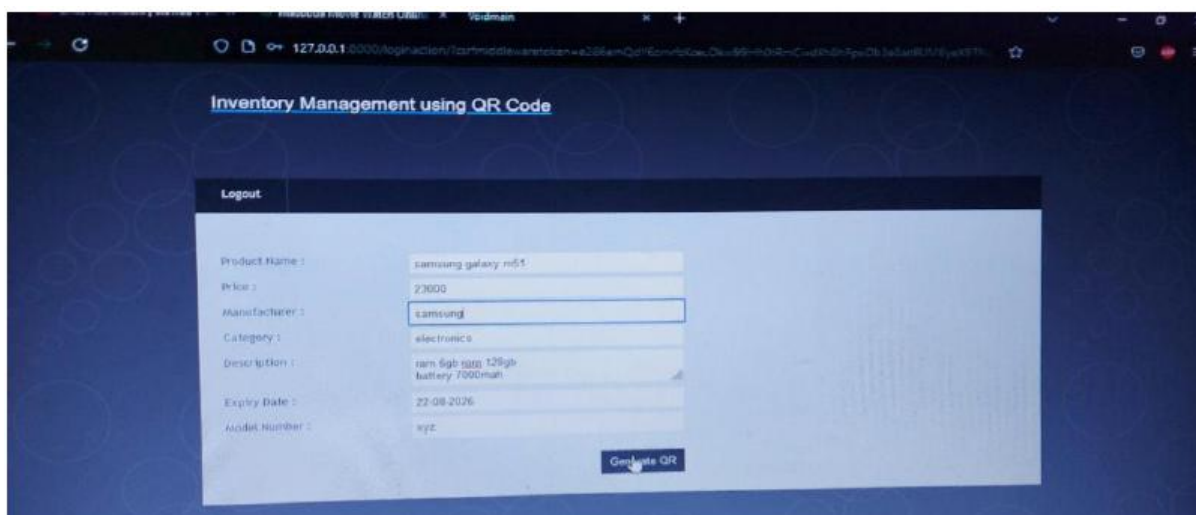Fig.2 Home page

Fig.3 Admin home page
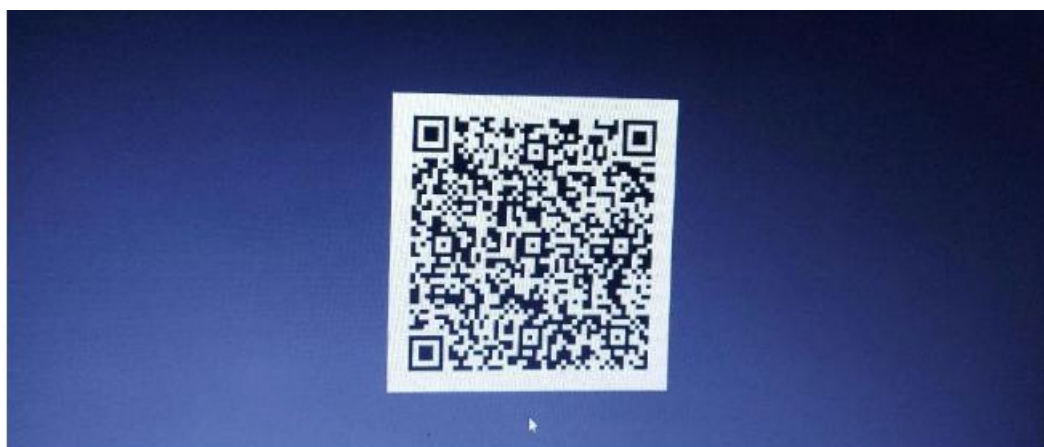

Fig.4 manufacturer login

Fig.5 Open QR Code

manufacturer can login and he can generate QR code for the selected products and with the count as shown in below
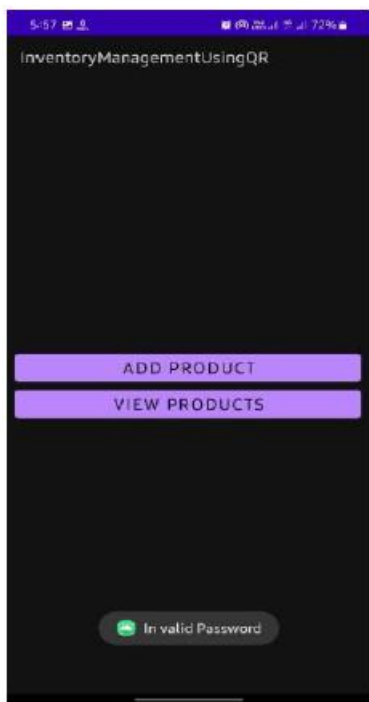

Fig.6 Employee login

Fig.7 Employee home page

The items added by the generating QR code by manufacturer can be viewed in an app, the app interface looks like below. The above QR code is scanned in the app and it will show all the details of the products.

V.   CONCLUSION

A QR code inventory management system is meant to serve you in the best and easy

way. So, you can manage, maintain and track your inventory in the best possible way. Thus, a complete stock management system was created which would help the owners/managers/workers of the shop to maintain their stocks using the barcode scanner. It will reduce the worker's efforts to manually maintain the track of each item and their headache of maintaining the register since everything would be stored in the database. It will also make the workers give accurate gold price (item price) to the customers and will reduce the process time in which worker goes to the owner to ask information related to the item and also save the time to calculate the item price, since the current gold price will be automatically fetched from the server and item price will then be automatically calculated and shown to the customer.

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