Asset Management Information and Tracking System With QR Code Based on the Human Centred Design Method

Benrahman
Faculty of Information and Technology, Universitas Nasional, Jakarta, Indonesia
benrahman@civitas.unas.ac.id

Abstract. - At the moment almost surely in all establishments or companies having an inventory system, especially about the processing assets, to get information about the asset takes time and cannot be instantly able to display the data. Based on the above problem, the author doing research is to obtain information about the asset information easily, quickly. The method used is to add a QR Code on a label pasted on each asset. Data from the QR code scanned through Android smartphone in the get information directly. In the research tried to research by optimizing the existing inventory system in the modification by adding a web address in the QR Code labels. Using the scan QR has become the default standard Android smartphone in every new. The author sure this article could be useful for anyone who uses the Inventory can be optimal. The results of this application are anyone able to get the status of existing asset information about QR Code, once done testing and implementation results are 99.9% valid.

1. Introduction
The problem for this that often comes up is information on the inventory system in particular asset management lack direct information about the asset.

With the use of Android QR to help to check items in PTIIK to Tag client description goods [1]. Incoming and outgoing goods Control for pharmacies Parham using the QR code that aims to make it easier to do transactions grain [2]. The reporting of goods by applying the Android and using QR code QR codes to identify products which required [3], [4]. QR code utilization as the identification code by storing products Fund 7,089 code and store the same data with barcode According to (Denso 2011). The error rate on the QR code funds 30% rupture can translate or scanned well [5], [6], [7]. Research identification with QR code from a database with a web application and android, go to Tagclient or [item information 8], further research on QR code can help in-store inventory in real-time [9]. Research on data security via QR code applies to produce a QR code discussed is not readable by humans but can read by Smartphones [10].

Limitation problem in this study discusses the QR code, and asset tracking/history of assets can directly get on the assets, information obtained in other asset description, identity, tracking/history and age of assets, calibration, because of the date. The processing of inventory at the company's liquid must and must do not, hence the author-date back some of these systems can be optimized inventory using android standards; asset information immediately is known. On some research that uses QR code more to transactional, such as incoming and outgoing items, this research was conducted specifically to be informed immediately for anyone who needs. Security or the security of the author using the Check
Digit to keep safety for the information not to abuse. Limitations of research only for information that could be as soon as possible the assets obtained information without having to contact the person in charge of inventory assets.

2. Research Method

2.1. Stages of application system Flowchart

![Flowchart](image)

Figure 1. Steps of application system Flowchart.

Analysis: in this step, the author analyzes your needs and try to bring up a suitable model, and the report also determines the restrictions of learning system related problems or changes that must be made in the existing system before, identify and address the impact of the project against the organization.

Design: Input from the user system collected, to determine the design of the system that will propose, in the plan of these authors also design/coding and script modifications to the existing database now

Evaluation: the author evaluates immemorial change is there any impact on the system that runs

Implementation: Menerapakan systems that have modified, the system sometimes requires configuration after design for resetting the parameters needed.

2.2. Process Method Human Centred Design

Human-Centered design (HCD) is also the human-centered design, as used in ISO standard 13407:1999 is a design and management framework to develop solutions to problems by involving the human perspective in all steps the process of solving problems. Human involvement usually occurs in observing issues in context, brainstorm, draft, develop, and implement solutions.
2.3. Workings of Quick Response Code

In this research, the Standard Quick Response Code already exists in almost all Smartphones. Smartphone exists Quick Response QR Code scanned, a group of black dots arranged in a grid with a white background. Only 1-dimensional bar code whereas the nature of two-dimensional QR Code,
which means a QR Code can accommodate 350 times more information than a barcode UPC. Not only so, but the QR Code also has an error correction which is built-in, which means "QR Code is more resistant to damage due to exposure to water or tear.

The workings of the QR Code QR is to do a scan with a smartphone will automatically be able to yield information about the asset in the scan, with your smartphone QR code labels direct to it.

2.4. Flowchart QR Code

![Flowchart QR Code](image)

Figure 5. Flowchart Quick Response Code

Scan of the smartphone QR, QR Code if the match with a QR Code that is in the system inventory will automatically display the asset information. Otherwise, the message will show.

2.5. Architecture QR Code

![Architecture QR Code](image)

Figure 7. Architecture QR Code

The architecture of the QR Code image above describes Architektur, QR Code, subject to the Qr white, the author uses QR Code Version 2 that is 25 X 25 rows and columns.

The workings of the QR Code in this study.
The workings of the QR Code, in this study, the author using Black Box testing, data attached:

### Table 1: Black Box Testing

| Data Input                             | Data Expected                                      | Observations                                    | Conclusion            |
|----------------------------------------|----------------------------------------------------|-------------------------------------------------|-----------------------|
| Master Inventory data provided QR Code labels + Check Digit | Defines the data will be stored in the database and will appear in the list of data Inventory | The data stored in the database                  | [X] Accepted          |
|                                        |                                                    |                                                 | [ ] Rejected          |

#### QR Code Testing

| Testing with Smartphone Samsung Galaxy E7 | The data will appear in a matter of seconds with a Smartphone | The data appeared in 7 seconds, and all information Assets appear on the smartphone | [X] Accepted |
| Testing with Smartphone Xiomi A5        | The data will appear in a matter of seconds with a Smartphone | The data appeared in 4 seconds, and all information Assets appear on the smartphone | [X] Accepted |
| Testing with Smartphone Samsung A8      | The data will appear in a matter of seconds with a Smartphone | The data appeared in 4 seconds, and all information Assets appear on the smartphone | [X] Accepted |

2.6. **The design of the QR Code from the Master Inventory**

The design of QR Code is the author of taking the ID of the Master Inventory + unique CD as a number of the Master Inventory, generate a QR Codebase on Master Inventory, and author determine QR Code version 2 (25X25) because of any smartphone will be unreadable. Picture after in kind as follows:
To display and print QR Code writers use the Fonts QRfontfb.dll.

2.7. **Check Digit**

The addition of check digits functions to the existing inventory system.

![Check Digit](image)

**Figure 10, Script Check digit**

The image above is a check digit that is applied by the author for security or data security.

2.8. **The design of a Web Application for Host Real Inventory System**

In this study add one field in the Master Inventory on Real Inventory System is active, i.e., the Check Digit (CD), type character length one as the control for the ID in the system, and perhaps also as a refinement of the existing system.

2.9.1 **Hardware and Software used**

In this study using the hardware: Laptop i3-3220 Processor (3 m Cache, 3.30 GHz), 2 GB of DDR2 memory, 500 GB hard drive, and Software: Visual Studio Version 12 and 12 SQL ServerExpress edition and QRCodeFont.dll.

3. **Results and Discussion**

Process scan QR Code aims to display the information Assets that appears in front of the eyes directly, how is the author of directly testing using Smartphones Samsung E7 year 2014, using QR Scan such as pictures, Information Direct asset to appear.
Figure 11: Proses QR Scanning from Smartphone

And the scan results instantly appear on your Smartphone the information of the Asset information: ID, date of purchase, the location of the first, the last position, the calibration Date, expiration date, the purchase price (optional), Owner of the Asset. As Figure 12.

Figure 12: Display Of Information Assets

Show applications on Smartphones after the Scan QR, direct information obtained on the condition that there should be a Smartphone internet connection.

4. Conclusions.

Based on the results of these studies anyone can figure out Information/Asset tracking, ID, date of purchase, the location of the first, the last location, the calibration Date, expiration date, the purchase price (optional), Owner of the Asset. The results showed by using Scan QR Code can be used with any Smartphone, in this study using the Smartphone Samsung E7 year 2012, 2017 year Xiomi A5 and A8 Samsung year 2017, then the, i.e., success rate of 99%. The authors suggest to optimize existing resources to the maximum possible and improve effective and efficient, and this application is worthy and needs to be applied, as an average of all agencies/companies using Inventory System live modification little direct can implement. The author also opens up if anyone wants to achieve this, please contact the email above, will be happy to help.

Can also be performed on the next study to add the location of the Asset be with latitude and longitude base of Android.

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