INTEK Jurnal Penelitian
Vol. 9, No. 1, pp. 42-48, April 2022

Quick Response Code for Inventory System Development (Case study: Accounting Unit At Ujung Pandang State Polytechnic)

Hayani [1,a], Muh. Fajri Raharjo[2,b,*], Eddy Tungadi[3,c]
[1,2,3] Computer and Network Engineering, Electrical Engineering, State Polytechnic of Ujung Pandang
[a,*]hayani296@gmail.com,
[b]aji.dokumen@gmail.com (Corresponding Author),
[c]eddy.tungadi@poliupg.ac.id

Abstract--QR stands for Quick Response, which is in accordance with its purpose is to convey information quickly and get a fast response as well. In contrast to barcodes which are only able to store information horizontally, QR codes are able to store information both horizontally and vertically. Therefore, that automatically QR codes have the ability to store more data than barcodes. QR codes can be used in the inventory system at the State Polytechnic of Ujung Padang to make it easier to read inventory data. In this study, the author will create an inventory system using a QR Code. The inventory system will be made online so that it can make it easier for admins and staff to process data and present information. This system is made in PHP and uses MySQL database for data storage, while the QR code is created using the Ciqrcode library. While in reading the QR code on the android application using the Zxing library. The inventory system built can make it easier to process inventory data and present information to the Accounting Unit at State Polytechnic of Ujung Padang.

Keywords: Inventory System, QR Code, MySQL

I. Introduction

Information technology has a huge influence on human life in almost every area of life. One technology that is quite well known is the QR code. QR is an abbreviation of Quick Response, which is in accordance with its purpose is to convey information quickly and get a fast response [1]. In contrast to barcodes which are only able to store information horizontally, QR codes are able to store information both horizontally and vertically. So that automatically QR codes have the ability to store data larger than barcodes [2]. In addition, QR codes also have a smaller size than barcodes and are resistant to damage, even though some of the QR code symbols are dirty or damaged, the data can still be stored and read [3]. Therefore, QR codes are very suitable to be used as identification in inventory systems.

At the State Polytechnic of Ujung Pandang, the process of inventorying goods has been computerized with the SIMAK-BMN application (*Sistem Informasi Manajemen dan Akuntansi Barang Milik Negara*). This system helps in the search process, storing data files that become the inventory of the Ujung Pandang State Polytechnic. But sometimes it is still found that the goods were moved without any notification to the inventory admin, so that the inventory recording was not in accordance with the existing conditions [4].

The above problems are overcome by creating an information system that aims to improve performance in the inventory data processing process. This information system is made based on a QR code by utilizing the QR droid application as a scanner. However, until now, this system has never been applied to the Accounting Unit of the State Polytechnic of Ujung Pandang. The weakness of this system is that there is no facility to add large amounts of data at once, so that the input of inventory items is still done manually by inputting item data one by one. In addition, the QR code used only stores information in the form of a link to the localhost database or server, so that if there is a change in the server address, the QR code created automatically cannot function properly.

In this research, a system will be created that can input large amounts of inventory data by setting up import facilities for the application to be made. This

DOI : http://dx.doi.org/10.31963/intek. v9i1.3458

system can be used by admins and staff to add data, view data, update data and delete data. In addition, the creation of a QR code using an application that can be adjusted as needed and makes it easier to view item information. This system is expected to be applied to the Accounting Unit of the Ujung Pandang State Polytechnic so that it can make it easier to carry out an inventory.

A. Inventory

Inventory is the activity of carrying out the management, administration, regulation, recording and registration of inventory/property goods [5]. Inventory aims to provide identification for all facilities in the industry. The inventory made must contain clear and easy to understand information quickly, so that it can help smooth the work.

B. Quick Response Code

QR code is an image in the form of a two-dimensional matrix that has the ability to store data in it [6]. QR code is an evolution of barcode (bar code). QR Code stands for Quick Response Code, or can be translated into a quick response code. In contrast to barcodes which only store information horizontally, QR codes are able to store information horizontally and vertically, therefore automatically QR codes can accommodate more information than barcodes [2]. In addition, QR codes no longer require special devices because they only use the camera to read them [1].

Figure 1. QR Code Example

C. Web Server

Website or site can be defined as a collection of pages that display text data information, still or motion image data, animation data, sound, video and or a combination of all of them, both static and dynamic which form a series of interrelated buildings where each linked to a network of pages (Hyperlink) [6]. Static if the information content of the website remains constant, rarely changes, and the information content is in the same direction only from the website owner. It is dynamic if the information content of the website is always changing, and the information content is interactive in two directions from the website owner and users [6].

D. Programming language

1) PHP (Hypertext Preprocessor)

PHP is the most widely used script programming language today. PHP is widely used for programming dynamic websites, although it is possible to use it for other uses [7]. PHP (an acronym for PHP: Hypertext Preprocessor) is a programming language that functions to create dynamic websites and web applications that interact with databases, files and folders so that PHP can display dynamic content from a website [8].

2) HTML (Hyper Text Markup Language)

HTML is the original language of www, which has become the standard language for displaying data on the internet. The development of html is very rapid, currently the latest version of html has reached html 5 [9].

3) CSS (Cascading Style Sheets)

CSS is a stylesheet language that is used to set the appearance of a document written in a markup language [11]. The most common use of CSS is to format web pages written with HTML, XML, and XHTML [9].

E. MySQL

MySQL is a SQL database management system software or DBMS that is multithreaded, multi-user, with about 6 million installations worldwide. MySQL is a Relational Database Management System (RDBMS) which is distributed free of charge under the GPL (General Public License). Where everyone is free to use MySQL, but it should not be used as a commercial derivative product. MySQL is actually a derivative of one of the main concepts in databases for a long time, namely SQL (Structured Query Language) [7].

DOI : http://dx.doi.org/10.31963/intek. v9i1.3458

MySQL is a database server program that is capable of receiving and sending data very quickly, multi-user and using SQL (Structured Query Language) basic commands [10].

F. Android

Android is a Linux-based mobile device operating system that includes an operating system, middleware and applications. Android provides an open platform for developers to create their applications [11]. Android is the first mobile platform that is complete, open, and free [12]. Complete (Complete Platform) means developers can take a comprehensive approach when they are developing the android platform. Open (Open Source Platform) means the android platform is licensed Open Source so that developers can freely develop applications. While free (Free), that is, there are no licenses or royalty fees for the development of the Android platform, no membership fees are required, Android applications can be distributed and traded in any form.

G. Black Box Testing

Black box is a test that is focused on functional requirements or the correctness of input and output resulting from the software being built [13]. Black box testing will be done by giving input from the user to the system that is already running and observing the output of the system.

II. Research methods

The research method is needed so that this research can be structured so that the results obtained are in accordance with the objectives of the research. The stages of this research procedure can be seen in Figure 2.

A. Data collection

At this stage, observations were made on the data studied by conducting interviews with staff related to the creation of an inventory system and looking for literature studies related to the problems studied.

B. Need Analysis

This analysis aims to find out what kind of system is suitable to be applied. Appropriate hardware and software, and who will be using the system.

1)Hardware

The hardware needed to create the "Inventory System using QR code" application is a laptop and a smartphone. The minimum requirements for the required equipment can be seen in Table 1 and Table 2 below.

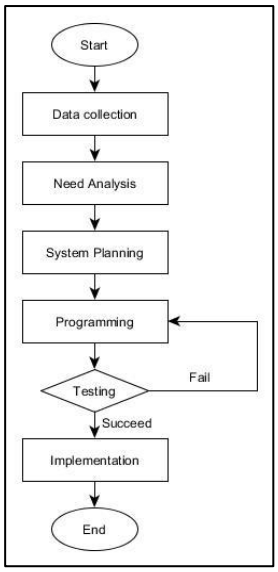


Figure 2. Research Procedure

Table 1 Minimum laptop requirements

No.	Hardware	Minimum	Recommendation
1.	Processor	Intel core duo	Processor i3
2.	RAM	3 GB	8 GB
3.	Harddisk	320 GB	500 GB

Table 2. Minimum smartphone requirements

No.	Hardware	Minimum	Recommendation
1.	Camera	3 MP	5 MP

2)Software

The software needed in working on this system can be seen in the following table.

DOI : http://dx.doi.org/10.31963/intek. v9i1.3458

Table 3. Software Requirements

No.	Software	Function
1.	Sublime text	As a text editor for php, html, css, JS scripts
2.	Xampp	To install the apache server and make the laptop a local server
3.	MySQL	To create a database
4.	Web browser	As application test
5.	Android Studio	To create an android application
6.	yED graph	To create a use case design
7.	Framework CodeIgniter	Generate a neat programming structure with MVC concept
8.	PHPExcel	To read a spreadsheet file from the Excel file format
9.	Library Zxing	To make it easier to build a QR code reading application on android
10	Library Ciqrcode	Makes it easy to create a QR code

3)Brainware

Those who will be users of the "Inventory System using QR Code" application are the room attendant, staff and head of the Ujung Pandang State Polytechnic Accounting Unit.

C. System planning

1) Diagram Use Case

The use case diagram describes an interaction between one or more actors and the system to be created. Use case diagrams are used to find out what functions exist in a system and who has the right to use these functions. Figure 3 explains the use case diagram in the system to be built.

2) Entity Relationship diagram

ERD data model (Entity relationship diagram) is a diagram that describes the relationship between data objects [14]. The design of the ERD on the inventory system can be seen in Figure 4.

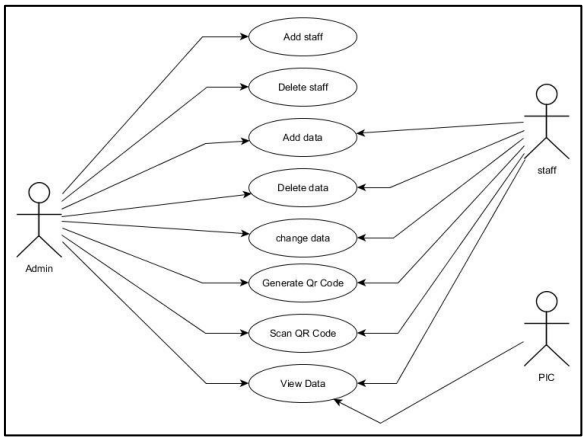


Figure 3. Diagram use case

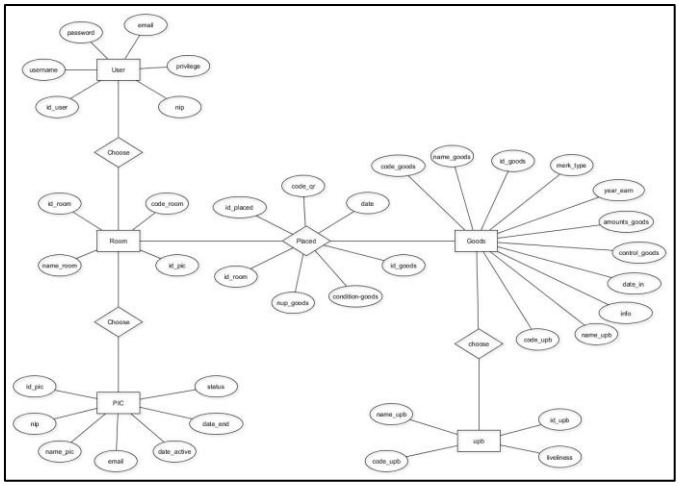


Figure 4 Entity Relationship Diagram

D. Testing Step

Tests are carried out to check whether a system that has been produced can be run in accordance with the purpose of system design. System testing is the most important thing that aims to find errors or deficiencies in the system that has been built. The testing technique used in this study is black box testing.

E. Data collection technique

The research data is sourced from the test results which will later be analyzed as research results.

III. Results and Discussion

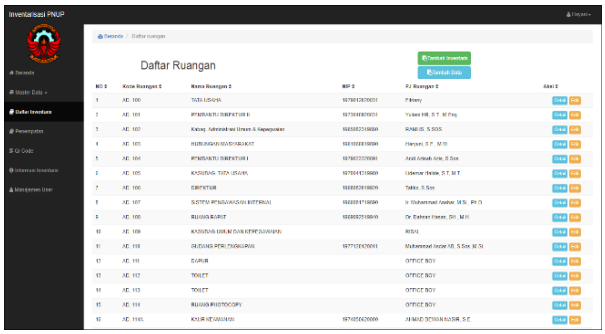
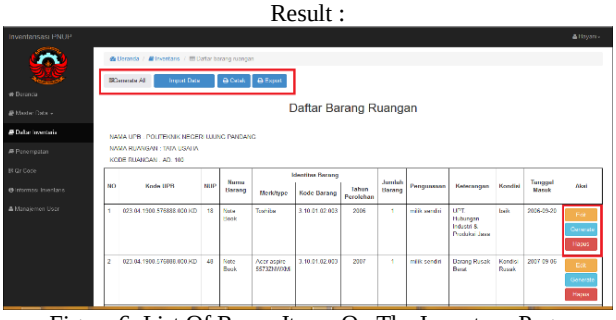
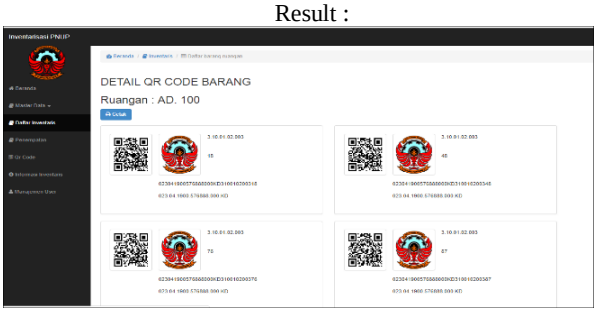
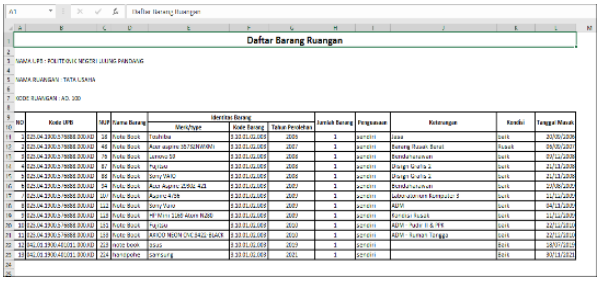
The system built in this study consists of 2 main parts, namely a web-based system and an android application. a web-based inventory system is used by users to

DOI : http://dx.doi.org/10.31963/intek. v9i1.3458

process inventory data while the android application is used to read data on the QR code contained in inventory items. The following are the results of tests carried out on a web-based inventory system and android application.

A. Inventory Web

Table 4. Testing on Inventory Web

No	Data Input	Which is Expected	Observation	Result
1	Displays a table of room list input result on the inventory module inventory page.	The system displays the input data from the room table and the PIC table on the inventory page.	The system displays the input data from the room table and the PIC table on the inventory page.	Succed
	Result :  Figure 5. List of Rooms on the Inventory Page			
2	Pressing the detail button on inventory module.	The system displays a list of room items according to the selected room.	The system displays a list of room items according to the selected room.	Success
	Result :  Figure 6. List Of Room Items On The Inventory Page			
3	Pressing the generate QR code button from the room item list in the inventory module.	The systems displays the QR code on the item QR code detail page.	The systems displays the QR code on the item QR code detail page.	Success
	Result :  Figure 7. Generate All Function On List Of Room Items			
4	Adding room item data with the import data button on the list page room items on the inventory module.	The system will add item data according to the data entered	The system will add item data according to the data entered	Success
5	Downloading room item data with the export data button on the room item list page on the inventory module	The system will download the room item data in excel file format	The system will download the room item data in excel file format	success
	Result :  Figure 8. Export Function On Inventory Page			

B. Android Aplication

Table 5. Testing on Android Aplication

No.	Data Input	Which is Expected	Observation	Result
1	Enter username and password. Username and password are correct/	Login to the home page.	Login to the home page.	success
	Result :			

DOI : http://dx.doi.org/10.31963/intek. v9i1.3458

<table>
<tr><td></td><td colspan="4"> 

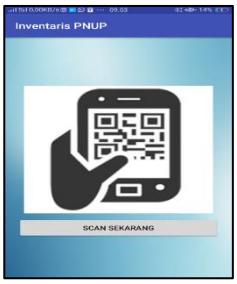
Figure 9. Login page</td></tr>
<tr><td rowspan="2">2</td><td>Pressing the scan QR code button on the home page.</td><td>The system will scan the QR code on the inventory item.</td><td>The system will scan the QR code on the inventory item.</td><td>success</td></tr>
<tr><td colspan="4">Result :
 

Figure 10. Scan QR code page</td></tr>
<tr><td rowspan="2">3</td><td>Press the scan QR code button.</td><td>The aplicatation scans the QR code and displays item data on the datascan page.</td><td>The aplicatation scans the QR code and displays item data on the datascan page.</td><td>Success</td></tr>
<tr><td colspan="4">Result :
 

Figure 11. Data scan page</td></tr>
</table>

IV. Conclusion

After designing to testing, the following conclusions are obtained.

1. The inventory system using a quick response code can be completed properly. This can be seen from the test with a success rate of 100%.
2. The application can integrate the QR code found on the inventory item label with the inventory module. This can be seen from the test with a 100% success rate.

Acknowledgement

The authors would like to thank the Ujung Pandang State Polytechnic and the Accounting Unit and BMN staff who have assisted and provided data in completing this research.

References

[1] Rahmat, M. I. “Perancangan sistem identifikasi kependudukan berbasis QR code”, (QR Code-Based Population identification system design). Thesis. Not Published. Study Program Computer and Network Engineering. State Polytechnic of Ujung Pandang: Makassar. 2013

[2] Nugraha, M. P. “Pengembangan Aplikasi QR Code Generator dan QR Code Reader dari Data Berbentuk Image”, (Development of QR Code Generator and QR Code Reader Applications from Image-Shaped Data). *Konferensi Nasional Informatik – KNIF 2011,* 148-155. 2011.

[3] Lioni Bernadine Jesica S.T, Tanone Radius, S. K. “Perancangan Aplikasi Pelayanan Pemesanan Buku Pada Android Platform Menggunakan QR-Code (Studi Kasus: Perpustakaan dan Arsip Daerah, Salatiga)”, (Designing a Book Ordering Service Application on the Android Platform Using a QR-Code (Case Study : Region Library and Archive, Salatiga)). Thesis. Scientific Articles, pp 1-24. Faculty of Information Technology. Satya Wacana Christian University. Salatiga. 2016.

[4] Beatrix, T. G. “Sistem Informasi Inventaris berbasis QR code pada Politeknik Negeri Ujung Pandang”, (QR Code-Based Inventory Information System at Ujung Pandang State Polytechnic). Thesis. Not Published. Study Program Computer and Network Engineering. State Polytechnic of Ujung Pandang: Makassar. 2013.

[5] Rianto, Eru Puspita, S.kom, M.kom, Wiratmoko Yuwono, S. “Sistem Informasi Inventarisasi alat/barang di SMKN 1 Jenengan Ponorogo Berbasis Web”, (Information System for Inventory of tools/goods at SMKN 1 Jenengan, Ponorogo, Web Based). Thesis. Kampus PENS-ITS Keputih Sukolilo Surabaya. Politeknik Elektronika Negeri Surabaya. Surabaya. 2010.

[6] Riyadi Anggiani Septima, Retnandi Eko, D. A. “Perancangan Sistem Informasi Website Subsistem guru di sekolah pesantren persatuan islam 99 rancabango”, (Website Information System Design for the teacher Subsystem at the Islamic Unity Islamic Boarding School 99 Rancabango) . Jurnal Algoritma, Vol. 9, No. 2, hal. 327-337. 2012 https://doi.org/10.33364/algoritma/v.9-2.327

[7] Ramadhani, S., Anis, U., & Masruro, S. T. “Rancang Bangun Sistem Informasi Geografis Layanan Kesehatan Di Kecamatan Lamongan Dengan PHP MySQL”, (Design and Build a Geographic Information System for Healt Services in Lamongan District with PHP MySQL). Jurnal Teknika, Vol. 5, No. 2, hal. 479–484. 2013.

[8] Yuliano, T. “Pengenalan PHP”, (PHP Introduction), Ilmu Komputer, *1-9.* Komunitas eLearning IlmuKomputer.com. 2007. [Online] Available https://ilmukomputer.org/wp-content/uploads/2009/03/triswan-pengenalanphp.pdf

[9] Kusuma, W. F. "Pengembangan Halaman Web Menggunakan XML dalam Perkembangan WEB 2.0", (Web Page Development using XML in Web 2.0 Development). Jurnal Teknik Informatika, Vol. 6, No. 2, 2015.

[10] Shah, C. , "MySQL: In A Hands-On Introduction to Data Science*"* pp. 187–206. Cambridge University Press. 2020. https://doi.org/10.1017/9781108560412.008

[11] Affan, M. Perancangan Media Pembelajaran Interaktif 3d Tata Surya Menggunakan Teknologi Augmented Reality Untuk Siswa Kelas 6 Sekolah Dasar Sangira, Jurnal Elektronik Sistem Informasi dan Komputer, Vol.1, No. 2, 45–60. 2015.

[12] Juniastha, I. kadek, Agus wirawan, I. made, & Resika arthana, I. ketut. "Rekening Air Minum Berbasis Android Dengan Quick Response Code Di PDAM",(Android-Based Drinking Water Account with Quick Response Code in PDAM), Kumpulan Artikel Mahasiswa Pendidikan Teknik Informatika (KARMAPATI) Vol. 3 No. 6, 411–418. 2014.

[13] Hidayat, A., & Surarso, B., "Penerapan Arsitektur Model View Controller (MVC) dalam Rancang Bangun Sistem kuis online Adaptif",(Application of Model View Controller (MVC) Architecture in the Design of Adaptive Online Quiz System), Seminar Nasional Teknologi Informasi dan Komunikasi 2012 (Sentika 2012) Yogyakarta 10 Maret 2012 ISSN: 2089-9815, 2012 (Sentika), 1–8. 2012.

[14] Binarso, Y. A. dk. "Pembangunan sistem informasi alumni berbasis Web pada Program Studi Teknik Informatika Universitas Diponegoro",(Development of a Web-Based alumni Information System at the Diponegoro University Informatics Engineering Study Program), Journal of Informatics and Technology. Vol.1, No. 1 p 72–84. 2012.

DOI : http://dx.doi.org/10.31963/intek. v9i1.3458