Database application based on quick response method in Subulussalam Aceh

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Abstract. Customers are a very important part of the sustainability of a company. The PT. PLN (Persero) is a state electricity company in Indonesia. It has many customers in the Subulussalam district. This study aims to design a customer data management system for PT. PLN (Persero) using the QR code scanner. The method used in this system uses a use case diagram and waterfall model. The database design uses the Entity Relationship Diagram (ERD) model. The system implementation uses PHP as the system interface and MySQL as its database. By scanning the QR code on the customer's meter so the officer can find out the customer's identity number and data. The system test results show that field officers can access customer data in realtime so that the information obtained becomes faster and more accurate.

1. Introduction
Indonesia is a country with a very rapid development of information technology. With the development of information technology, the need for the use of technology for a company's services has increased. PT. PLN (Persero) is a state electricity company with many customers [1]. Millions of customers in the company's database must be able to be managed and managed by the company so that service to customers can be met properly. Quick response (QR) code is a type of matrix code or two-dimensional barcode that can be used as a code to convey response information immediately [2] [3].

Several studies of QR code that have been carried out by several researchers in some applications include those conducted by [4] who research on the use of QR codes in hospitals that function to access patient medical information. This system works by conducting QR code tags that have been installed in various locations with a QR code reader application that has been installed on a smartphone or tablet. The next researcher by [5] who examined the use of QR codes for attendance system applications using the Android operating system. The QR code used in this system is the generated QR code that is displayed on the QR code reader screen owned by students. The next researcher was [6] who examined the use of QR codes in laboratory inventories. This application uses Bootstrap framework that supports responsive web technology so that applications can be accessed using mobile phones. The next researcher by [7] who examined the use of QR codes in the smart car parking system. QR code technology in this system is able to provide security and comfort for all users. From some of this research, we try to examine the use of QR codes in customer data management at PT. PLN (Persero) Subulussalam. This QR code can be used as a customer code that can provide customer data information in realtime so that field staff can get customer data information quickly.
2. Methods
The research method in this study as shown by the flow diagram in figure 1.

![Flow Diagram](image_url)

**Figure 1.** Research method flow diagram.

2.1. Object and research location
This research has been carried out by field studies at PT. PLN (Persero) Subulussalam.

2.2. Design of system
The system design begins by modeling using usecase diagrams. Usecase diagram is to show how the interaction between usecase and actors. This diagram is also to find out what business events occurred and who performed it. Figure 2 shows the usecase diagram of this system.

![Use Case Diagram](image_url)

**Figure 2.** Use case diagram
2.2.1. Flowchart admin. Admin flowchart is required to find out how the main menu of the program displays until there is a response from the program when the admin chooses the options in the admin main menu. As for the admin's flowchart as shown in figure 3.

The picture explains the steps that applicable by the admin as follows:

a. Admin goes to the website.
b. Login by entering your username and password.
c. If the login is successful, the admin can manage and input customer data.
d. Admin verifies customer data to check the truth and accuracy of the data.

2.2.2. Flowchart user. The user flowchart is demanded to find out how the main menu of the program displays until there is a response from the program when the user chooses the options on the main menu. The flowchart of this user as shown in figure 4.
Figure 4. Flowchart user.

The picture illustrates the steps that can be done by the user as follows:

a. Users enter the website page.
b. User login by entering username and password.
c. If true, then the user enters the user page.
d. The user scans the customer’s QR code.

2.2.3. Design of database. A database is a collection of fields that have links between one field and another so that they form data buildings to inform the flow of data transfer. Database design using MySQL. The database is divided into three categories namely kwh, customers and users. The database design in this study as shown in figure 5.

Figure 5. Database of system.
3. Results and discussion

3.1. Login interface
Login interface is the first page displayed when a user accesses the website. Users can access the system using a username and password. If the password and username is match, then the user will be directed to a page based on the user's permissions. Display of the login page is shown in figure 6.

![Login interface](image)

**Figure 6.** Login interface.

3.2. Home interface
Home interface is the first display after a user with admin and field officer access rights has successfully entered the system. This display is the main page that displays the main menu (QR code scanner), the Home menu, the KWH data menu, the Customer data menu. The results of the implementation of the host look are presented in figure 7.

![Home interface](image)

**Figure 7.** Home interface

3.3. Category display
The category display is a page that serves to add customers' KWH photos, and KWH photo data. This display is a data storage page kwh customers who have taken by field officers. The results of implementing the Category display and data storage are presented in figure 8.
3.4. Customer page
Customer data display is a page that displays all customer data that has been recorded in the company's database. Display customer data is shown in figure 9.

3.5. Web page interface
The appearance of this webpage will be directed to end users using a browser. The appearance of the web browser page is shown in figure 10.
4. Conclusions
Based on the results and discussion that has been stated, it is known that QR code can be used to manage customer data of PT. PLN (Persero). This application can help field officers to find out customer data quickly and accurately.

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References
[1] Company Profile of PT. PLN
[2] Tiwari S 2016 An Introduction to QR Code Technology International Conference on Information Technology (ICIT) 39–44.
[3] Yuan T, Wang Y, Xu K, Martin R R, and Hu S 2019 Two-Layer QR Codes IEEE Trans. Image Process 28 4413–4428.
[4] Uzun V 2016 QR-Code Based Hospital Systems for Healthcare in Turkey IEEE 40th Annual Computer Software and Applications Conference (COMPSAC) 2 71–76.
[5] Hermanto N, Nurfaizah, Baihaqi W M, and Sarmini 2018 Implementation of QR Code and Imei on Android and Web-Based Student Presence Systems 3rd International Conference on Information Technology, Information System and Electrical Engineering (ICITISEE) 276–280.
[6] Rochmawati N, Budjitjahjanto I G P A, Putra R E, and Wicaksono A Y 2018 A Responsive Web-Based QR Code for Inventory in The Laboratory of Informatics UNESA IOP Conf. Ser. Mater. Sci. Eng. 288, 12109.
[7] Hoq E, Paul S, and Erin M T U R 2019 Development of a QR-Code Based Smart Car Parking System 5th International Conference on Advances in Electrical Engineering (ICAEE) 275–279.