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Designing a QRIS Management Application to Simplify Digital Transactions Using the Prototype Method

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ABSTRACT

In the digital era, financial transactions are increasingly dependent on information technology, particularly through the use of QRIS (Quick Response Code Indonesian Standard) developed by Bank Indonesia. This study aims to design a QRIS management application that facilitates business owners in efficiently managing various QR codes. The prototype method is used to describe the system to be developed, including QRIS data management, dynamic QR code generation, and structured database design. The design results show that this application can address issues related to cluttered displays caused by the use of multiple QRIS stickers, simplify the transaction process for consumers, and enhance the professionalism of merchants. Therefore, this application design is expected to contribute significantly to the efficiency of digital transactions and lay the groundwork for the development of more advanced applications in the future.

Keyword : QRIS Management; **Digital Transactions**; **Prototype Method**.

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1. INTRODUCTION

The digital era has brought significant changes to various aspects of life, particularly in financial transactions, where information technology plays a crucial role (Aulia Nur Miftitah & Mashudi, 2023). Sellers of goods and services can now choose from a variety of QRIS codes issued by providers such as LinkAja, OVO, Gopay, Dana, and banking applications (Sudyantara & Yuwono, 2023). QRIS is a national digital payment standard based on QR Code, developed by Bank Indonesia and the Indonesian Payment System Association (ASPI) (Lestari Pangastuti & YAP, 2023). This system allows customers to make payments by scanning the QR code provided by the seller via banking applications or digital wallets (Fadhillah Hayya et al., 2023). QRIS is expected to accelerate digital payment processes and simplify cashless transactions (Indriani et al., 2023).

In line with these developments, there are two QR payment modes: (1) Merchant Presented Mode, where the QR code is issued by the seller; and (2) Customer Presented Mode, where the QR code is displayed by the consumer for scanning by the seller (Widowati & Khusaeni, 2022). The use of QRIS provides benefits for merchants, including efficient cashless payments and support for business growth (R et al., 2023).

However, the daily transaction limit using QRIS is regulated by the bank, which means users have a cap on the number of transactions they can make (Umbu Kudu et al., 2023). Many merchants display QRIS stickers alongside stickers from other payment applications (Ariansyah et al., 2023), leading to cluttered store displays and making it difficult for merchants to identify which QRIS codes have reached their transaction limits. This can affect the customer experience, slow down the transaction process, and diminish trust in the professionalism of the merchant.

Based on the existing issues, this study aims to design a QRIS management application that can help business owners efficiently manage various QR codes. With this application design, it is expected that the payment method options for consumers can be simplified, thereby enhancing the transaction experience. The prototype method is used to illustrate the system to be developed and provide a clear overview of the expected functionality of the application (Wicaksana & Djutalov, 2023).

2. RESEARCH METHOD

Several stages will be carried out to design the QRIS management application using the prototype method, including:

a. Use Case Diagram, The methodology used in system analysis to identify, describe, and organize system requirements (Akbar, 2024). The use case in this application design illustrates how actors interact with the system to achieve a series of actions and helps in understanding how the system operates and how actors are involved in it (Maulana et al., 2024).
b. Activity Diagram, A diagram that depicts the sequence of activities within a process to facilitate understanding of the overall system process (Dwimas Ananda et al., 2024). The Activity Diagram provides a clear and easily understandable representation of how a process or system operates (Khoirunnisa et al., 2024).
c. Prototype Design, A system design framework that forms the model and sets the standards for size or scalability, which will then be developed into a product (Adani, 2021). In designing this prototype, the author developed a prototype for managing QRIS data and generating QRIS. The following is an explanation:
   - Manage QRIS Data: This prototype includes the management of QRIS data, such as adding, editing, and deleting data.
   - Generate QRIS: This prototype includes the process of generating dynamic QR codes that can create a new QR code based on the payment amount input.
d. Database Design, The process of designing the structure of a database to store data efficiently and in an organized manner (Noviyana & Nasution, 2024).

3. RESULTS AND DISCUSSION

A. Use Case Diagram

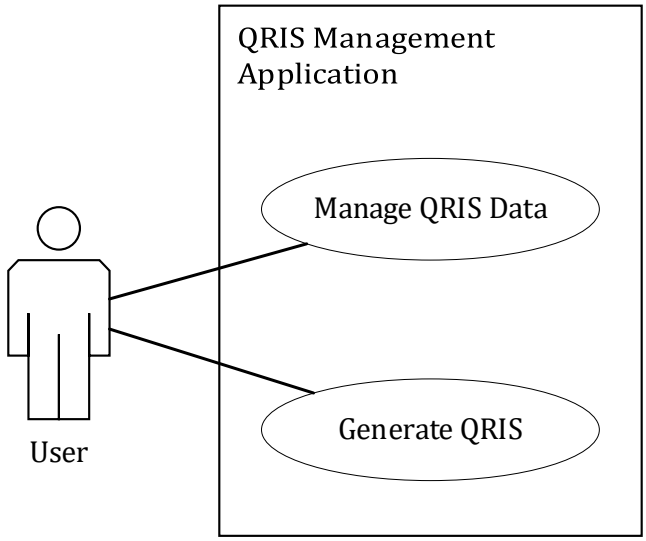

Figure 1, Use Case Diagram

In Figure 1, it can be seen that this QRIS management application uses only one actor, who acts as the user, as shown in Figure 1. The explanation is provided in Table 1.

Table 1. Explanation of the User Use Case Diagram

No	Activity	Actor
1	The actor can manage QRIS data	User
2	The actor can generate QRIS	User

B. Activity Diagram

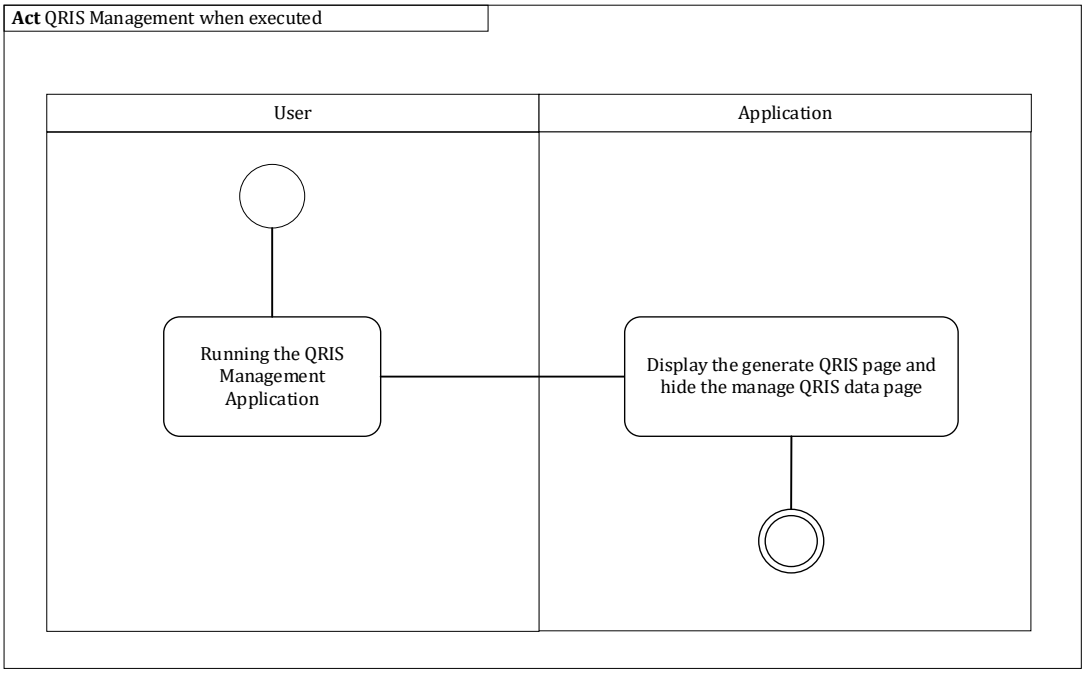

Figure 2, Activity Diagram of QRIS Management when Executed

In Figure 2, it can be seen that the user runs the QRIS management application, which displays the generate QRIS page and hides the manage QRIS data page

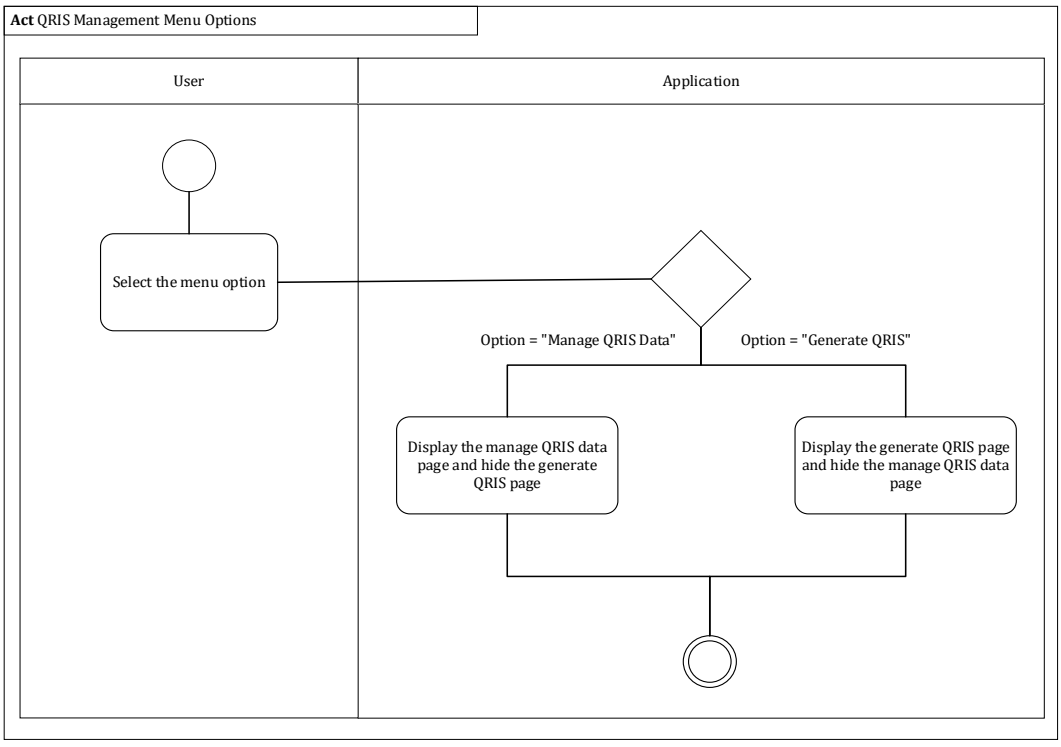

Figure 3. Activity Diagram of QRIS Management Menu Options

The user selects a menu option. If the selected option is "Manage QRIS Data," the application displays the "Manage QRIS Data" page and hides the "Generate QRIS" page. If the selected option is "Generate QRIS," the application displays the "Generate QRIS" page and hides the "Manage QRIS Data" page.

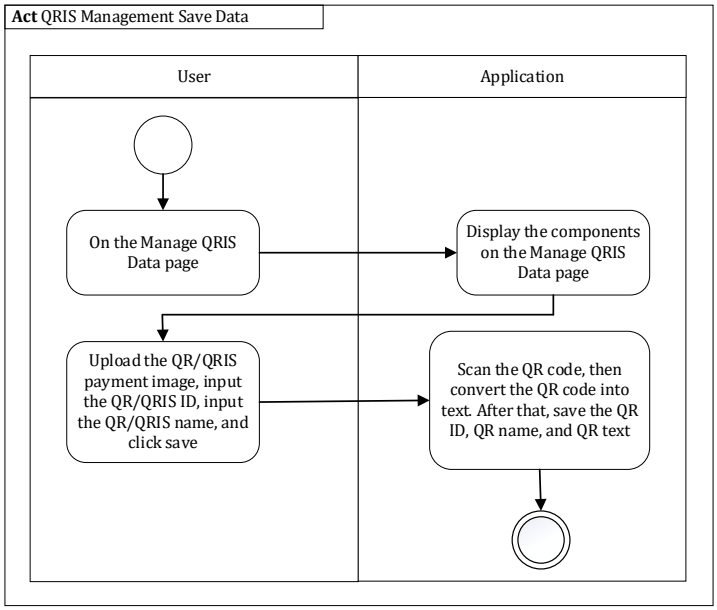

Figure 4, Activity Diagram of QRIS Management Save Data

The user is on the Manage QRIS Data page, where the application displays the components on the page. The user performs the following actions: (uploads the QR/QRIS payment image, inputs the QR/QRIS ID, inputs the QR/QRIS name, and clicks save). The application then converts the QR code into text and saves the QR ID, QR name, and QR text (the result of converting the QR code to text).

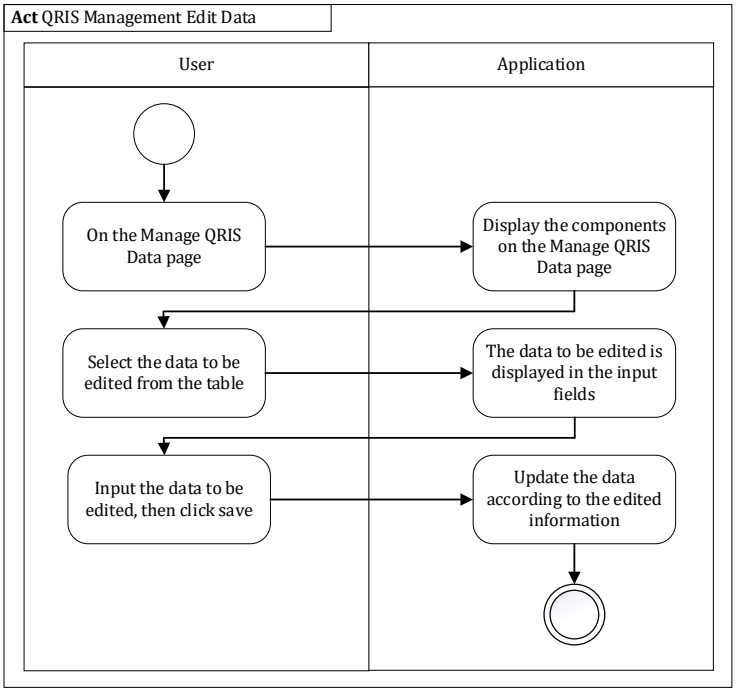

Figure 5, QRIS Management Edit Data

The user is on the Manage QRIS Data page. The application displays the components on that page. The user selects the data they want to edit from the table. Then, the application displays the data to be edited in the input fields. The user inputs the data they want to edit and then clicks the save button. The application updates the data according to the changes made and displays the edited data in the table.

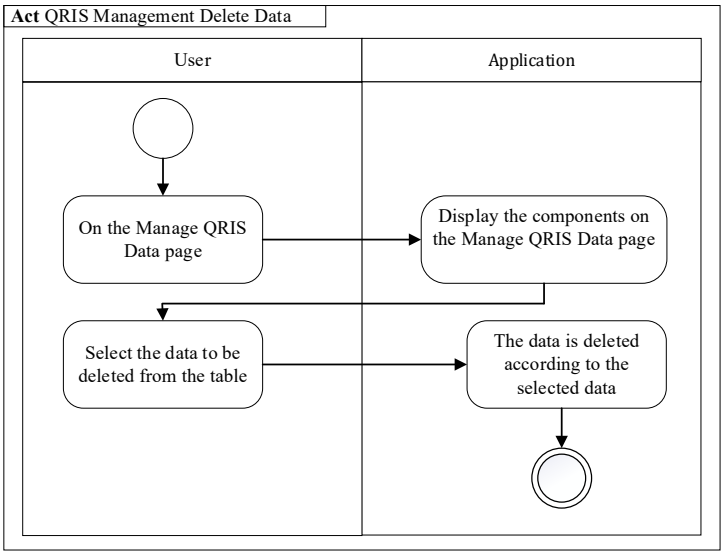

Figure 6, Activity Diagram of QRIS Management Delete Data

Figure 6 illustrates the activity diagram for the data deletion process in the QRIS Management application, starting with the user accessing the Manage QRIS Data page, where the application displays various components, including the data table. The user then selects the data to be deleted, and the application proceeds by removing that data from the database. Once the deletion process is complete, the application updates the table display to reflect the changes, providing visual feedback to the user that the unnecessary data has been deleted.

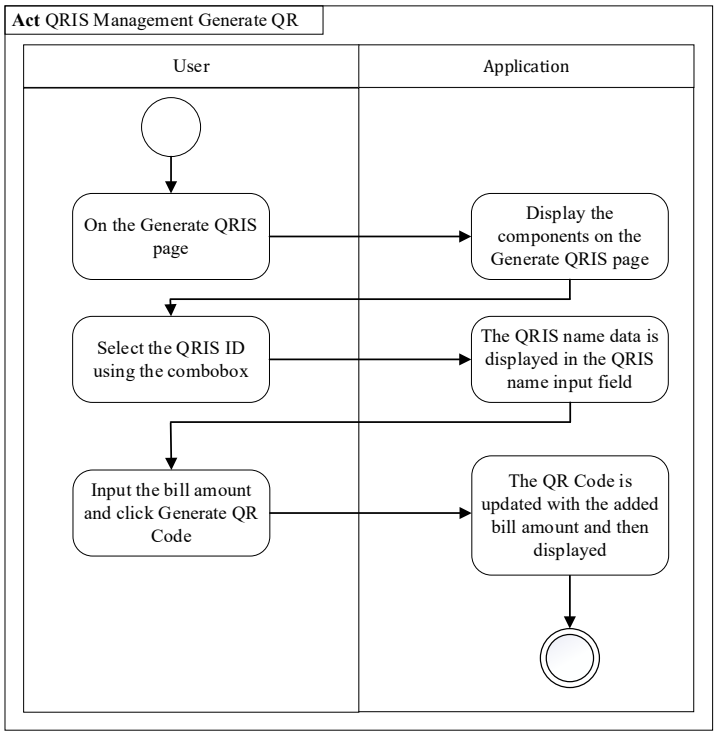

Figure 7, Activity Diagram of QRIS Management Generate QR

The user is on the Generate QRIS page. The application displays the components on that page. The user selects the QRIS ID from the combobox, and the application displays the QRIS name in the input field. The user then inputs the bill amount and clicks the Generate QR Code button. The application generates a QR code image that has been updated with the added bill amount.

C. Prototype Design

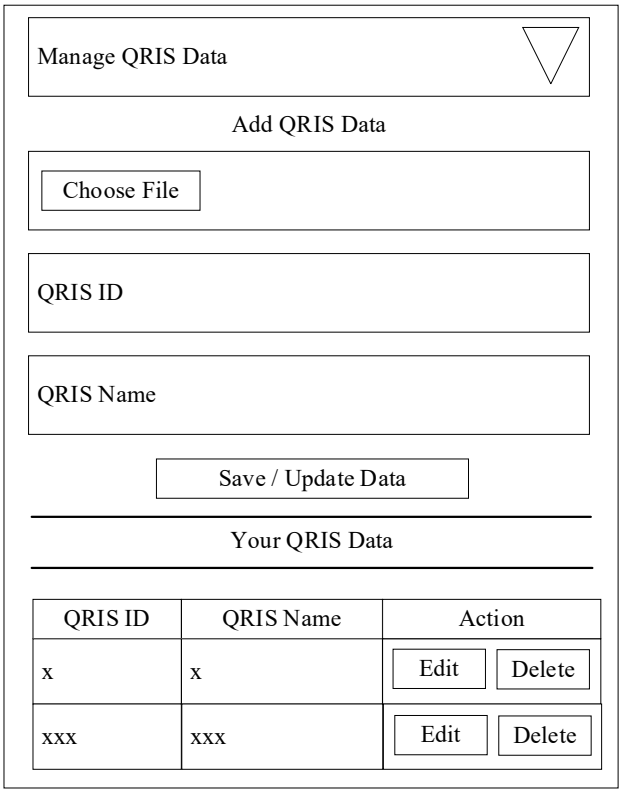

Figure 8, Prototype Design of Manage QRIS Data

In Figure 8, the prototype design for managing QRIS data is shown. This design consists of 1 combobox (Add QRIS/Generate QRIS), 1 input field for uploading a QR image file, 2 text input fields (Merchant ID and Merchant Name), 1 button (Save/Update Data), and 1 table to display the data, accompanied by 2 action buttons (Edit and Delete).

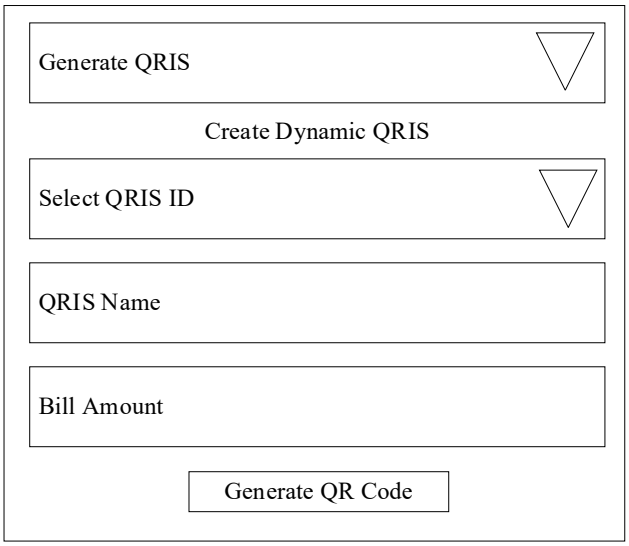

Figure 9. Prototype Design of Generate QRIS

In Figure 9, the prototype design for generating QRIS is shown. This design consists of 1 combobox (Add QRIS/Generate QRIS), 1 combobox (Select QRIS ID), 2 text input fields (QRIS Name and Bill Amount), and 1 button (Generate QR Code).

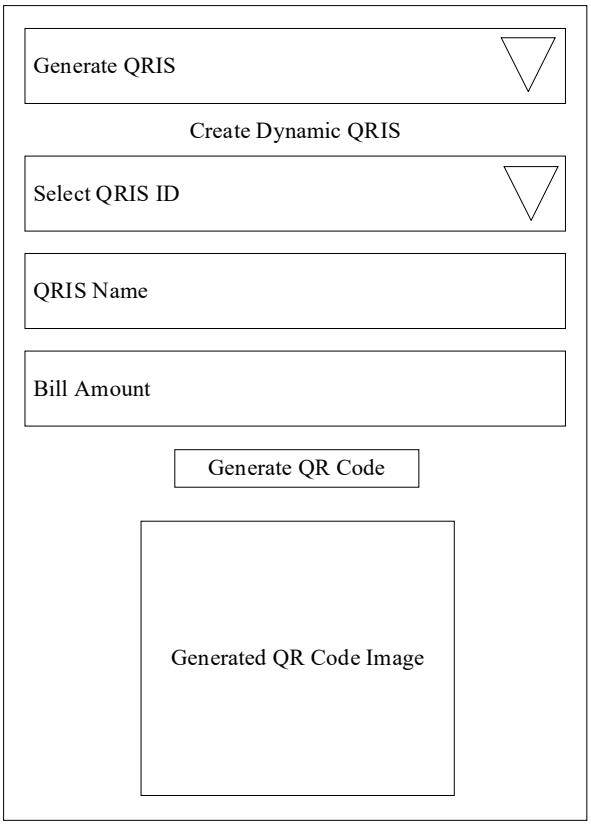

Figure 10, Prototype Design of Generated QR Code Result

In Figure 10, the display remains the same as in Figure 9, but with the addition of one image component: the QR code image generated when the user clicks the 'Generate QR Code' button. This image is the result of the creation process, corresponding to the selected QRIS ID and the entered bill amount.

D. Database Design

Table 1. Design of Manage QRIS Data Table

Column	Data Type	Description	Status
id_qris	varchar (20)	QRIS ID	Primary Key
qris_name	varchar (30)	QRIS Name	
qris_text	varchar (255)	Scanned QR image result stored as text	

As shown in Table 1, the design of the QRIS Data Management table consists of three columns: id_qris, qris_name, and qris_text. The id_qris column, with a data type of varchar (20), functions as the primary key, providing a unique identifier for each QRIS entry. The qris_name column, with a data type of varchar (30), stores the name of the QRIS, which may refer to the name of the merchant or the associated service. Meanwhile, the qris_text column, with a data type of varchar (255), is used to store the result of the scanned QR image in text form, containing the data embedded within the QR Code

4. CONCLUSION

This study successfully designed a QRIS management application aimed at facilitating business owners in efficiently managing various QR codes using the prototype method. The design provides a clear overview of the expected functionalities, such as QRIS data management, dynamic QR code generation, and a structured database design. The outcome of this design is expected to address the issue of clutter caused by the use of multiple QRIS stickers and simplify the transaction process for consumers, while also enhancing merchant professionalism and speeding up the payment process. Overall, the design of this application makes a significant contribution to supporting the efficiency of digital transactions and lays the foundation for future application development.

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