Financial Technology with QRIS Payment System for Entrepreneurship Locker

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Abstract— The Covid-19 pandemic has an impact not only on health but also on human activities, one of which is economic transactions. A number of policies related to health protocols have caused limitations for the community in transacting with each other. In relation to economic transactions, entrepreneurial transactions on campus have stopped due to policies related to the pandemic. To answer this problem, an invention called "Culinary Business Automatic Service Locker (Entrepreneurship Locker)" that based on the Internet of Things that implements financial technology in its payment method was created. The implementation of Financial Technology is intended to revive entrepreneurship on campus by providing a "new user experience" to all parties involved in these activities. In recent years, financial technology as a new concept in payments has been growing. The concept of finance technology is to create a payment platform where there is no longer a need for physical interaction between the seller and the buyer, because the transaction process occurs via digital. QRIS, which stands for Quick Response Code Indonesia Standard is one of the financial technology-based payment methods that has been authorized in Indonesia. There are two types of QRIS, namely static QRIS and dynamic QRIS. In this study, the dynamic QRIS API will be used because it is able to generate different nominal and QR codes for different transactions. In addition, an e-wallet is needed for users to support payments by scanning the QR code via smartphone. This research wants to see how the application of financial technology using dynamic QRIS and e-wallet to entrepreneurial lockers. The results showed that financial technology using dynamic QRIS and e-wallets can be utilized in the automatic payment system for entrepreneurial lockers.

Keywords— dynamic *QRIS*, entrepreneurship locker, *e-wallet*, financial technology, *QR-code*, transaction

I. INTRODUCTION

Since the Covid-19 outbreak was declared as a pandemic by the World Health Organization (WHO) in March 2020, the threat of the Corona virus still exists today. The impact of the Covid-19 pandemic has brought many changes in human activities [1]. All activities that require humans to interact and meet face to face must be limited. There are policies such as health protocols, lockdowns, work from home, and physical distancing, all of which are done to prevent the spread of the virus [2].

Aside from having an impact on health, the Covid-19 pandemic also has an impact on the people's economy [3]. The factor in the decline of the country's economy is due to the limitations of the community in transactions. This is inseparable from government policies that urge people not to do activities outside. As a result, the process of face-to-face (F2F) transactions between business actors and consumers is difficult to do [4].

One example that is affected by the limited economic transactions is entrepreneurial activity on campus. Entrepreneurship as one of the drivers of economic activity on campus must be stopped along with the learning

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process that has shifted online (non-face-to-face). Before the Covid-19 pandemic, entrepreneurship on campus was realized through the involvement of certain partners who opened canteens or outlets. However, if this is reapplied, there needs to be adjustments that can overcome the challenges of health protocols in carrying out transaction activities.

Due to limited human mobility, the digital platform has become an option for transactions [1]. Digital financial transactions (Fintech) are considered as a reliable solution in making payments [5]. The development of technology and the growth of e-commerce has increased the use of digital payment methods [8]. Currently, the adoption of Fintech as a payment platform is accelerating along with the Covid-19 pandemic [9].

One of the digital payment methods that has been officialized by the Bank of Indonesia in 2019 is QRIS, which stands for Quick Response Code Indonesia Standard [6]. "QRIS is a tangible form of payment technology innovation for the country's economic progress and recovery during the pandemic," according to Perry Warijyo, Governor of Bank Indonesia. QRIS is able to make the cashless payment system faster, safer, and more practical by simply scanning the QR code through an e-wallet [12].

There are two types of QRIS, namely static and dynamic. Static QRIS is fixed, meaning that the QR code is only generated once so it will not change [6]. While dynamic QR has a QR code that can be changed and has the ability to load different transaction data [12].

Another way of doing technology-based payments (fintech) is through e-wallet services [9]. E-wallets provide a tool for people to conduct cash financial transactions through digital (mobile devices) rather than physical transactions [11]. Payment through E-wallet requires users to verify and identify in every transaction, thus making the security of this online transaction guaranteed [13]. Just like physical wallets, e-wallets are able to store personal information such as credit cards, debit, pins, and ID cards [7]. In addition, E-wallet allows users to track detailed transaction information activities that have been carried out [14]. Currently there are many e-wallet services available to users such as DANA, OVO, Gopay, LinkAja, and many more.

As an additional effort to revive entrepreneurship on campus that had stopped, a invention called "Culinary Business Automatic Service Lockers (Entrepreneurship Lockers)" by integrating the Internet of Things (IoT) and Financial Technology (Fintech). IoT technology in the entrepreneurial locker plays a role in facilitating lockers to connect with entrepreneurial partners so that they can provide products and transact with customers without physical interaction. Meanwhile, financial technology with QRIS and e-wallet will support the process of customers making payments and opening access to products in the lockers.

With the application of information technology in entrepreneurial activities on campus, it is hoped that it will encourage enthusiasm and create new experiences for all parties involved, especially in the way of payment using fintech technology. This invention also expands the involvement of other partners who want to be entrepreneurial in a more innovative way. This research will focus on the implementation of an automated payment system using QRIS and e-wallets in Internet of Things (IoT)-based entrepreneurial lockers capable of providing convenience and digital payment transaction activities quickly, safely, and practically.

II. METHOD

The design of a digital payment system with Financial Technology is based on the concept of entrepreneurial locker design. With the following details.

Primary and Secondary Data Sources

Primary data was collected through surveys and needs mapping based on the concept proposed in the entrepreneurial locker invention. In addition, Focus Group Discussion (FGD) was also conducted to explore other needs in product development.

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Secondary data was obtained from journal research sources available on the internet.

Information System

Based on the design of the culinary business automatic service locker, the researcher will create a website-based application system to handle ordering and payment transactions in the entrepreneurial locker. The web-based application is made using HTML, PHP, and Javascript programming languages.

The transaction process is carried out through the website application via a tablet computer available at the entrepreneurship locker. In addition, from the user side, they will need an e-wallet on their smartphone to make payments through QRIS scans.

How QRIS Works from the Business Side

The design of a digital payment system through QRIS for entrepreneurial locker invention from the business actor's side is presented in the sequence in Figure 1.

In this process, the application will provide a display for customers to make payments with QRIS. The system will generate invoices and request codes to be displayed as QR code images for customers. After the customer scans the QR code and makes the payment process, then the system will direct to the payment status API. If the payment status is "Paid", then the payment is successful. However, if the payment status is unsuccessful or "Expired", the QR code will be re-generated.

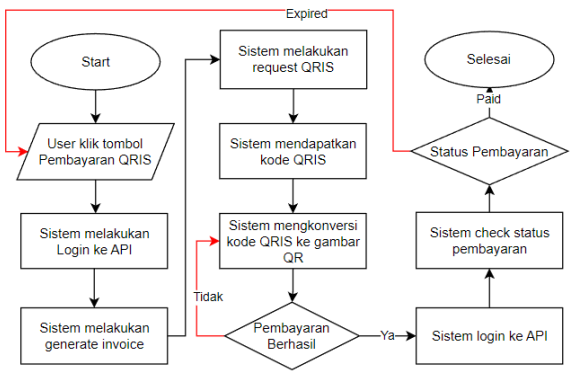

Figure 1. QRIS Payment Flowchart from the Business Side

How QRIS Works from the Customer Side

The design of a digital payment system through QRIS from the customer side is presented in the sequence in Figure 2.

In this process, the user will go to a website application that contains a menu for making transactions and payments. Users will see a QR code to be scanned using an e-Wallet. After the user successfully completes the payment via e-wallet, the user can see the payment status displayed on the screen. If the payment status is successful, the process is complete. However, if a notification appears that the payment has not been successful, it is necessary to re-scan with a new QR code.

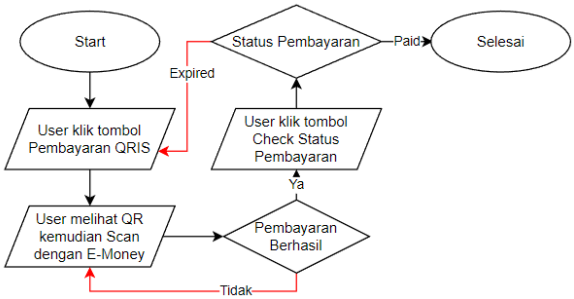

Figure 2. QRIS Payment Flowchart from the Customer Side

API QRIS

The QRIS API used uses HTTP POST and Secure Socket Layer (SSL) protocol connections with JSON data type. Encrypted data uses Advance Encryption Standard (AES) encryption type with CBC code and PKCS7 padding. AES Key parameters are encoded first with the SHA 256 method with different submerchant codes. The size used is 16 plus in front of the encrypted message. Session ID is used as the session timeout during the transaction and defaults to 10 minutes.

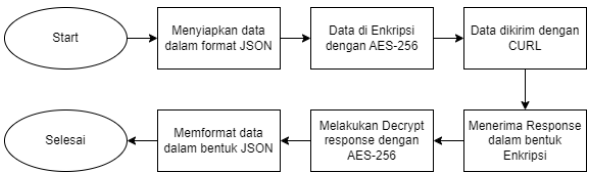

Figure 3. API Usage Flow

Dynamic QRIS

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In the QRIS development project for entrepreneurial lockers, a dynamic QRIS is used. This allows the QR code to be generated differently for each transaction. Thus making different nominals in each transaction can be realized through different QR codes.

III. RESULTS AND DISCUSSION

The results of the implementation of financial technology for entrepreneurial lockers are presented in the interface. The payment information system for making transactions at the automated service lockers is presented through a web-based application.

QRIS Transaction Implementation

The following are the results of the program and design of the digital payment system for entrepreneurial lockers that have been made.

a. Product Selection Stage

Users enter through the main menu page for food product selection through a set of tab/monitor devices available at the entrepreneurial lockers. This page will show a list of products available in each locker with product name, image, and price information.

Figure 4. Menu Page

b. Payment Stage Through Dynamic QRIS

At the payment stage, after the user chooses the product the system will direct the user to make a QRIS payment.

Figure 5. Payment Page

After clicking QRIS Payment, users can scan the QR code on the screen and make payments through their e-wallet.

Figure 6. QRIS Payment Page

Here is an example of a dynamic QRIS result that has been generated for one of the transactions in the entrepreneurial locker.

Figure 7. Example of Dynamic QRIS

By using dynamic QRIS, nominal input errors when users make payments will not occur. Unlike the static QRIS, the dynamic QRIS nominal will be set directly automatically from the QR code so it is very useful in the automatic payment system. In addition, the QR code that has been scanned will not be able to be used again for other transactions, so the QR code will be generated with a new one.

c. Successful Payment Stage

If the payment step via e-wallet has been completed by the user, the user can click the Check Payment button. If successful, an alert message will appear that the payment was successful.

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Figure 8. Successful Transaction

Figure 9. Failed Transaction

d. Admin Page

The admin page is the page used by the admin to manage the content of the user page. To enter the admin page, login access in the form of username and password is required.

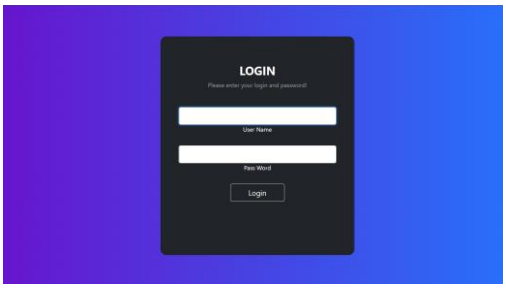

Figure 10. Admin Login Page

The following is a page for filling (input) data from the seller's side as initial registration. The data that must be filled in includes the seller's name, whatsapp number, address, account number, and bank number.

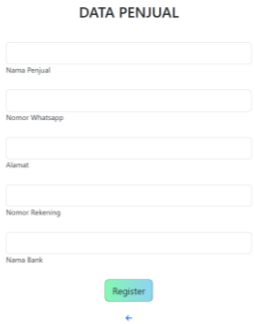

Figure 11. Seller Registration Page

Furthermore, the admin can fill in data on the items that will be placed in each locker by clicking on one of the locker images. The data will contain item name, price, description, seller, and product image.

Product data that has been successfully entered will immediately appear on the user page.

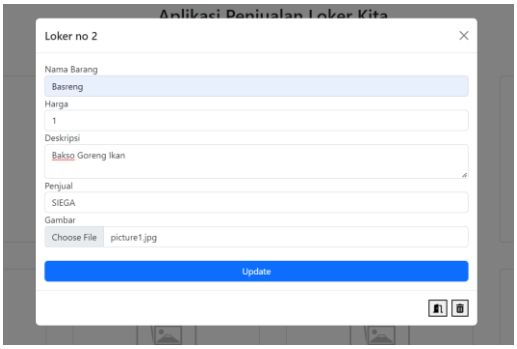

Figure 12. Product Data Filling Page

e. E-Wallet Payment

In making payments via QRIS, users can use any type of e-wallet that supports QRIS payments.

Here are some examples of transaction results via e-wallet (DANA, OVO, ShopeePay, and mBCA) that have been done.

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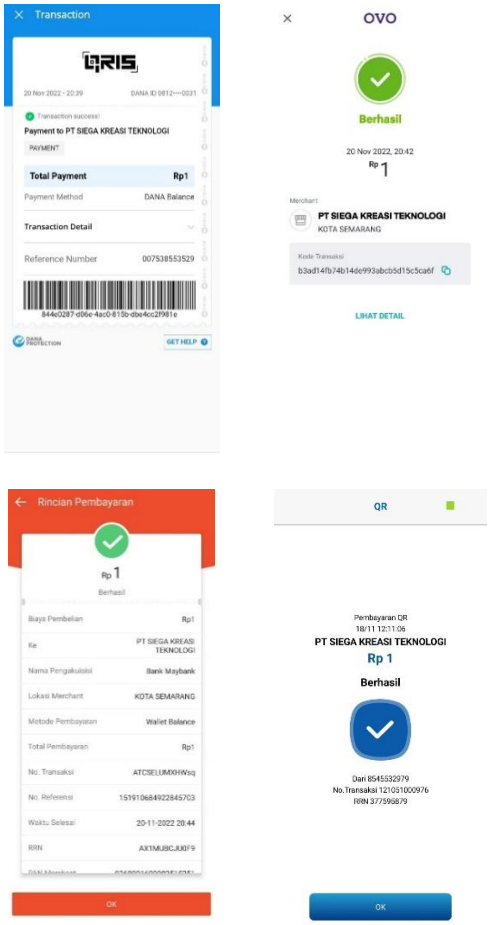

Figure 13. Payments via E-Wallet

IV. CONCLUSION

Based on the research results, there are several things that can be concluded. First, a financial technology-based payment system has been successfully applied to the invention of Entrepreneurial Lockers. The financial technology (Fintech) used is dynamic QRIS (Quick Response Code Indonesia Standard) and e-wallet.

Second, the use of dynamic QRIS in entrepreneurial lockers is intended to realize an automatic digital payment system. Dynamic QRIS is able to produce transaction amounts that always change per transaction. So that users only need to make payments by scanning QR codes using e-wallets and verifying their own payments.

Third, we can see how financial technology can be the right solution for transactions during the Covid-19 pandemic. Digital transaction methods are able to reduce physical interaction between customers and sellers due to the absence of face-to-face (F2F) transactions.

Finally, the implementation of financial technology in transaction activities will revive entrepreneurship on campus. In this context, the hope is that it will create a "new user experience" for all parties involved in increasing transaction activities on campus. It will also expand partners who want to do entrepreneurship on campus in a new and more innovative way.

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