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Implementation of Lean Software Development Method for Developing IPOS Cashier Application in Coffee Shop

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ABSTRACT

Cashier transactions at Coffee Shop XYZ are still done traditionally so that human error often occurs, reports are not real-time, there are still queues in payments, and financial transaction reports that have not been done quickly and accurately are problems experienced by Coffee Shop XYZ. The purpose of this paper is to develop an IPOS cashier application at Coffee Shop using the Lean method. The method used is descriptive analysis and data collection is carried out by direct interview methods with the owner and employees of Coffee Shop XYZ. A website-based IPOS cashier application is produced using the Lean method that can overcome current problems. System testing is carried out using black box testing. For the next research, the development of a mobile-based IPOS cashier application will be carried out to facilitate online ordering and payment.

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1. INTRODUCTION

Coffee shops or coffee shops are currently one of the culinary businesses that are very promising and continue to grow from day to day. [1]. The culinary business never stops because culinary is something interesting and beats other businesses. In addition to being a necessity for human life, the culinary business is also a mainstay of the economy in Indonesia [1] The tendency of Indonesian people to consume coffee and the millennial and gen Z generations who have an interest and consume coffee in comfortable places with a relaxed atmosphere. Coffee shops have often experienced problems and obstacles in the form of human error due to the cashier system which is still manual and sales reports that are not yet known in real time. So that from the problems experienced by Coffee shop XYZ, there is inefficiency in cashier transaction operations and recording errors have an impact on losses experienced by Coffee Shop XYZ.

In this era of information technology, everything requires fast and precise services and transactions, including digital payment services [2]. Payments are required to be digital to make it easier for consumers to make transactions and avoid queues [3]. Included in sales transactions that are easier to do digitally without having to come directly to shops, cafes and others [4].

The purpose of developing the IPOS cashier application in this coffee shop is to minimize human error due to the application that is still manual [5], the availability of controlled menu stock with the availability of stock notification if it approaches the minimum amount of inventory. The application that is built produces real-time reports so that it can save operational time for cashier transactions. No less important than this cashier application is customer satisfaction with a fast and accurate payment system without having to wait long. Service is an important thing for a business, be it a service, trade or manufacturing business, so this IPOS cashier application is very much needed to overcome the problems that occur at Coffee Shop XYZ.

2. METHOD

The data used was obtained from previous research literature studies based on predetermined keywords [6]. In addition, data was also obtained by direct interview methods with coffee shop business actors and several coffee shop employees in the Tangerang area. Interviews were conducted to ascertain the problems faced [7] by the current coffee shop and what needs are desired by the coffee shop, especially the problem of system needs and desired features. Field studies or direct surveys are carried out to see the progress of the sales transaction process, recording sales transactions to printing sales reports [8].

The development of the IPOS cashier application at this Coffee Shop was carried out using descriptive analysis with the data used as primary data where the data was obtained directly from the first source, namely the owner and employees of the Coffee Shop. Interviews were conducted in order to obtain information and data directly and accurately from the source. The research steps using the Lean Software Development (LSD) method were carried out as follows:

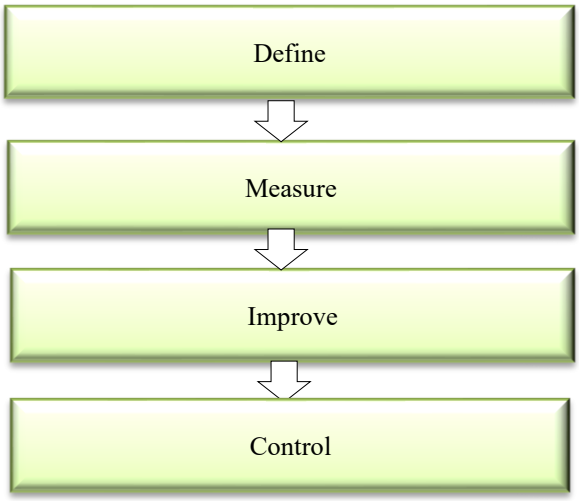

Figure 1. LSD Method Steps

The steps in implementing the LSD method on the IPOS cashier application at the coffee shop begin with identifying the problems that occur at Coffee Shop XYZ. After finding the problem, it is continued by analyzing the current system. Continued by designing a website-based IPOS Cashier system. The last stage before the system is implemented, the system is tested to ensure the system can run properly.

The system trial was conducted using the black box testing method, namely testing the use and functionality of the system to ensure that the system can be used optimally. This trial was conducted before the system was used by the user of Coffee Shop XYZ.

3. RESULTS AND DISCUSSION

The IPOS Cashier system was developed using the Lean Software Development (LSD) method to be more efficient and reduce waste. The system was developed with steps starting from identifying problems, analyzing the running system, designing a website-based system and conducting system trials.

3.1. Defiine

Implementation of the Lean Software Development (LSD) method is used to simplify services, especially in payment transactions, and to improve faster and more accurate services Ensure that the problems that occur in the Coffee Shop are resolved by building an IPOS application for the coffee shop as a simple but effective solution so that the problems of manual sales recording, difficulties in making reports and complex goods management can be resolved properly.

3.2. Measure

This stage is carried out by analyzing the current system and it is known that the current system is still very conventional so a computerized IPOS cashier application is needed.

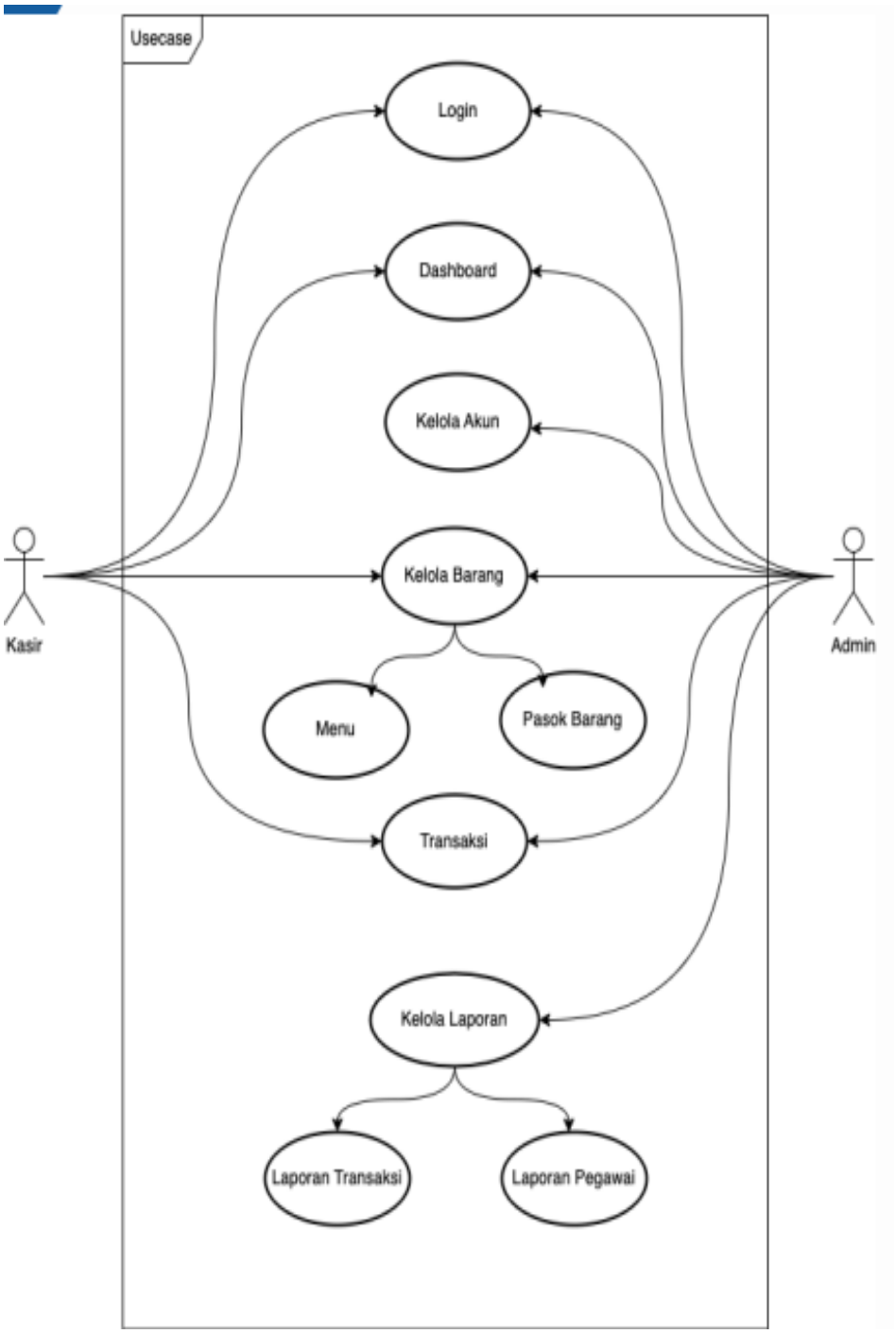

Figure 1. Use Case of the proposed system

Use Case in software engineering is one type of unified modeling language diagram that describes the interaction relationship between users and actors [10] and become an interaction between the user and the system. a potential scenario where the system receives an external request and responds to it [11]. The proposed system use case consists of two factors, namely the cashier and admin who have activities and a login menu, dashboard, account management, goods management, transactions and report management.

3.3. Improve

The implementation of the interface in the IPOS cashier application based on the website can be seen in the display which consists of various features that have been adjusted to user needs.

1). Login Page Menu

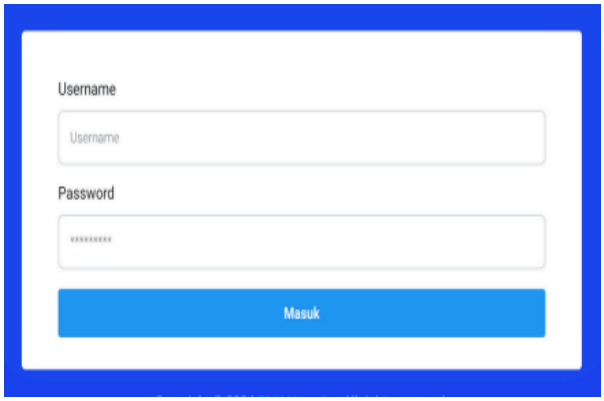

Figure 2. Login Page

Login Page When the user first opens the web, it will display the login page. This is the main page to access the content page. Here, the access rights of who is logged in will be checked.

2). Dashboard page menu

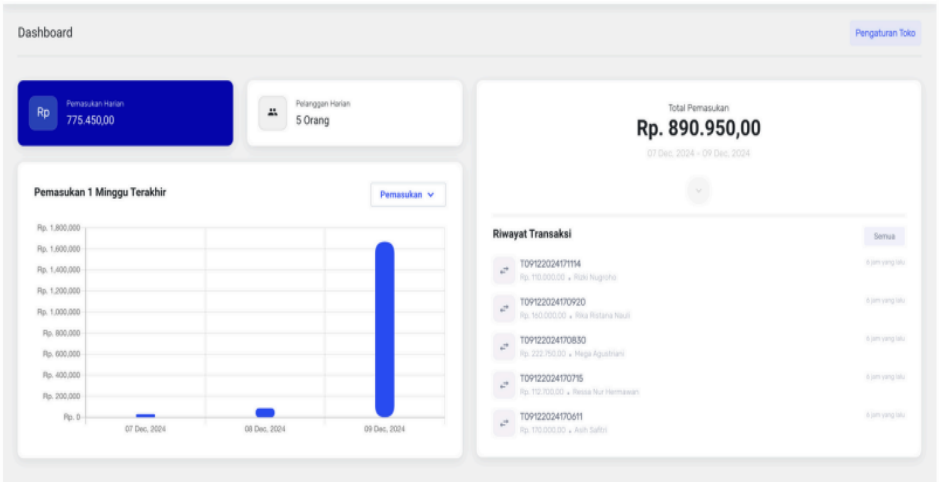

Figure 3. Dashboard Page

Dashboard page when the user first logs in, the dashboard page will appear. This is a visualization page for data, daily income, and total income. Consists of daily income features, total income, last week's income, and transaction history.

3). User Page (Account Registration)

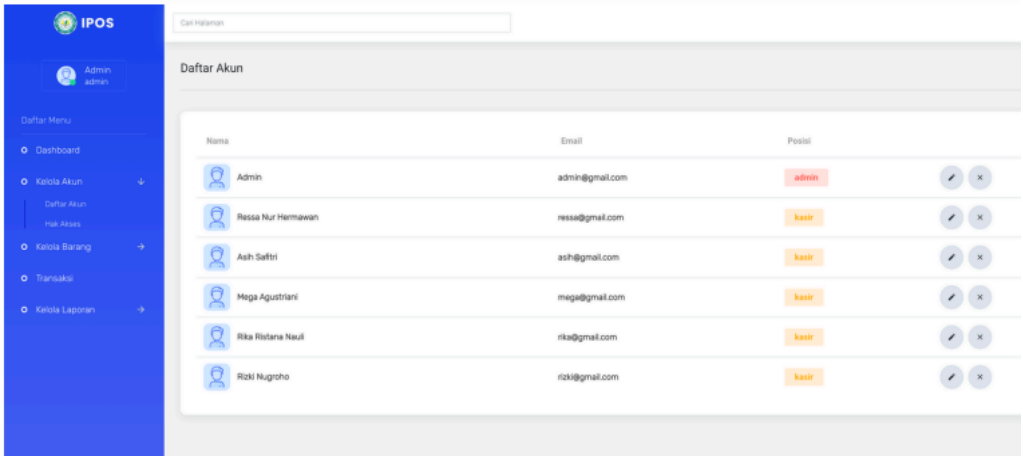

Figure 4. User Page

View of the user page where there is a table of user data. In the table contains Name, Email, Position and on the page there are several buttons, namely the add Account button and there are actions on the table, namely edit and delete. As an admin, a list of menus such as dashboard, manage accounts, manage goods, transactions and manage reports are visible.

4). Add User Page

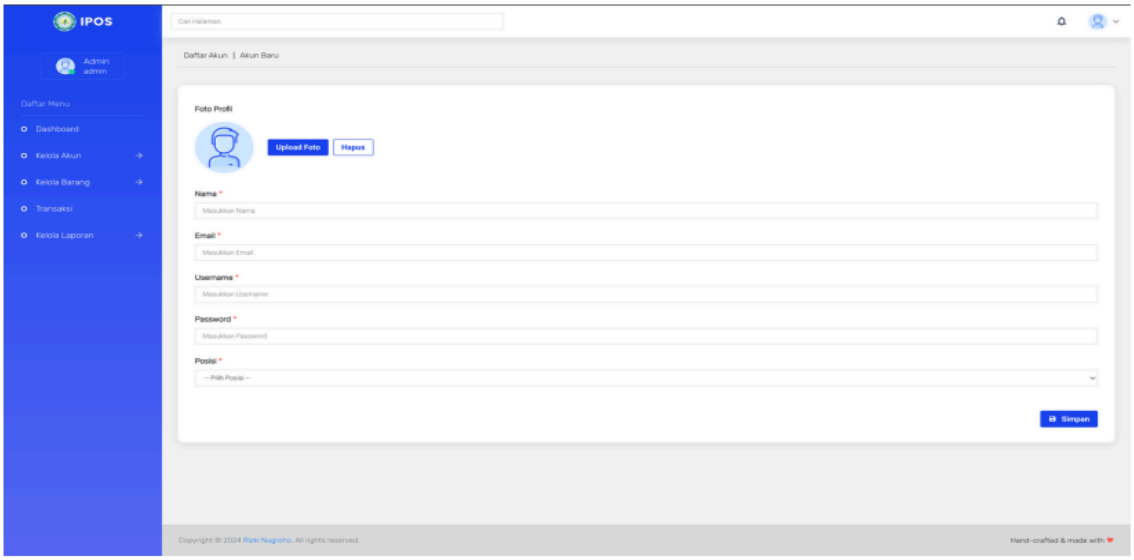

Figure 5. Add User Page

The display of the add account button that can be filled with new user data. What needs to be filled in is Upload Photo, Name, Email, Username, Password, and Select Position. If all have been filled in, Save to save the data

5). Manage Items Page

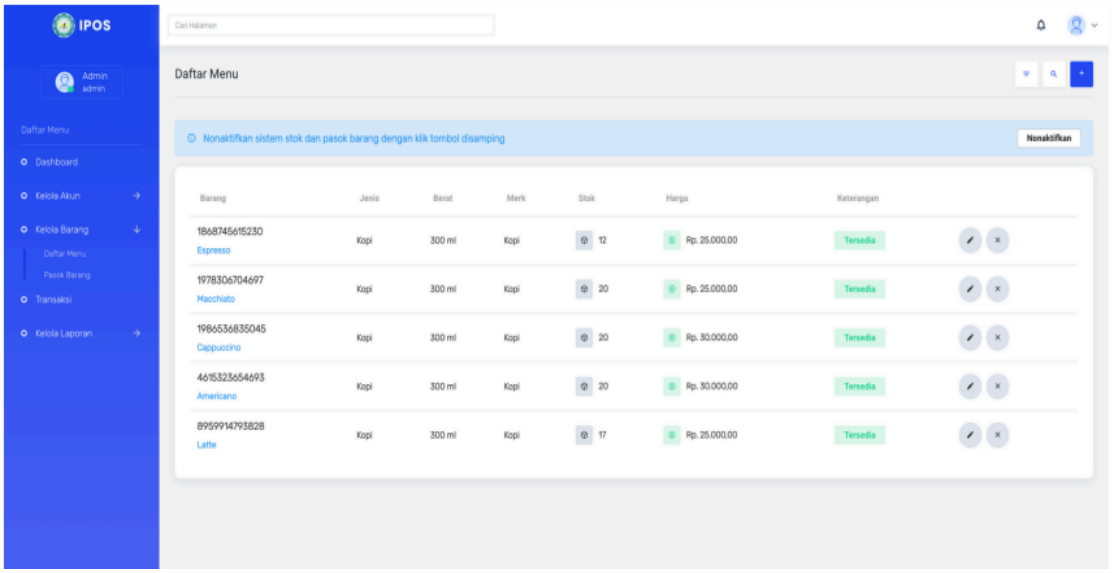

Figure 6. Manage Items Page

The display of the Manage Items page where it is in the form of a table of item names, Type, Weight, Brand, Stock, Price, Description. Which has several buttons, namely the add button, the stock of items that are low in number, there is an edit action button to change the data and the Delete button.

6) Transaction Page Menu

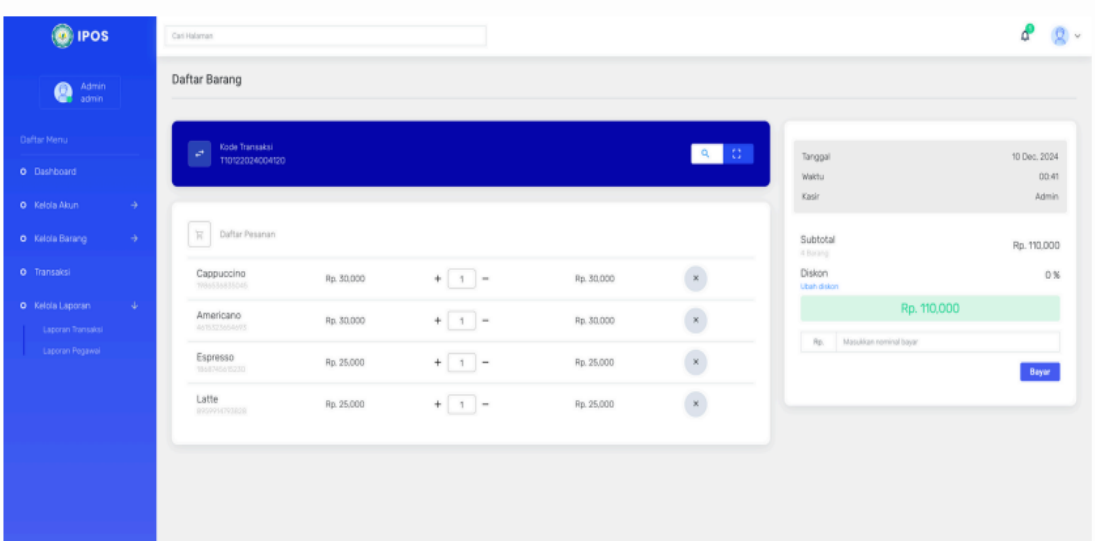

Figure 7. Transaction Page

There is a search field for goods and next to it is a function to scan the barcode of the goods. In the search for goods, you can search for goods by entering the first name of the goods only, then press enter, the search results for goods will appear which can be selected according to the goods being searched for. and there are discount and pay buttons to make transactions.

7) Transaction Report Page

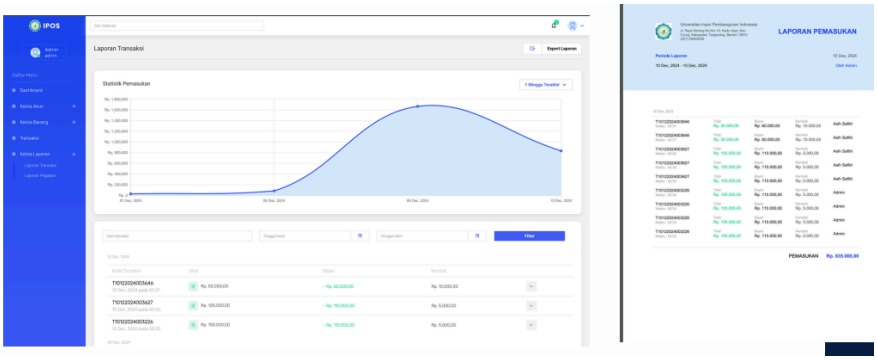

Figure 8. Transaction Report Page

View of the Transaction Report Page that displays data visualization from the last 1 week's income and can be filtered daily, monthly and annually as desired, and has an export report action button in PDF format for submission of income reports to superiors

3.4. Control

Black box testing is a method of testing software or applications that focuses on its functionality, without the need to see the program code used. This testing aims to ensure that the software or application being tested is suitable for use and meets the needs of its users [12].

Table 1. System Testing

No	Menu	Tested parts	Input	Output	Status
1	Login	Login Page	Login according to admin and cashier roles. Based on registered email and password	The system accepts login access based on role and is directed to the dashboard menu	valid
2	Dashboard	Dashboard Page	Click the Dashboard Menu	Add dashboard page, total income and data visualization	valid

No	Menu	Tested parts	Input	Output	Status
3	Manage Account	Account registration page	Click the account list menu	Display account list, add, edit and delete	valid
		Add, edit and delete buttons	Click the add, edit and delete buttons	The system successfully adds, edits and deletes accounts	valid
		Access rights page and grant access to selected roles	Click the Access Rights Menu and check the access rights	Displays the access rights page and the system successfully changes the rights	valid
6	Manage Items	Menu list page, barcode scan button, add, edit and delete	Click the menu list and the scan, add, edit, delete buttons	Displays the menu page and the system successfully scans, adds, edits and deletes menus	valid
7	Transaction	Transaction page, add menu, delete menu and payment amount	Click the transaction menu, register button, add, delete and payment amount	Displaying the transaction page and the system successfully added and deleted menus and successfully added up the total payment.	valid
8	Report	Transaction Report Page	Click the Report menu	Displays transaction report pages and sales visualizations	valid
		Print Transaction Report	Click Export	Displays weekly, monthly and yearly transaction reports in PDF format	valid

Testing using black box testing to test the functionality of the features used by users with the results that all features are declared valid.

4. CONCLUSION

The IPOS Cashier application was built using the Lean Software Development (LSD) method based on a website with testing using the black box testing method. The system was developed to solve problems that occur in Coffee Shops so that cashier services can be carried out quickly, efficiently and effectively. The problem of recording sales and reports that cannot be done in real time can be resolved. With this IPOS cashier application, Coffee Shops can easily do it. System has succeeded in increasing transaction efficiency by up to 80% and access rights can be clearly distinguished according to the role of admin and cashier. Automatic reports greatly facilitate sales analysis at Coffee Shops. The system was tested on a small coffee shop and received positive feedback and future application development will continue on the integration of digital payments.

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