Developing QR Payment to Enhance the Technological Service in Sederhana Restaurant Network

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ABSTRACT
This research is conducted in the Sederhana Restaurant network that use the system based on profit sharing among stakeholders with a ratio of the number 10: 7: 3 for employees, investors and brand holder respectively. Nowadays the restaurant network is managed manually with traditional cash payment. In order to meet the globalization and technology development, the restaurant planned to use QR for payment, so that the customers can make payment easily. This research uses SDLC model that consists of five stages such as planning, analysis, design, implementation, and maintenance. Subjects of the research are people who use the system such as customers and stakeholders. This research is still on going and the researchers would like to present the design of the system. Research findings show that QR payment can support restaurant and it is proper to be implemented.

CCS Concepts
• Applied computing → Business process management systems.

Keywords
QR code; restaurant; payment; mobile technology.

1. INTRODUCTION
Padang's restaurant chain, Sederhana Restaurant, is headquartered in Jakarta, which is considered the most successful Padang restaurant chain today. The progress achieved by this restaurant network needs to be exemplified by other restaurant chains because this business starts from a street vendor. It was founded in 1972 at the PD Pasar Jaya Bendungan Hilir Center in Central Jakarta. Nowadays, this restaurant network has grown and developed into hundreds of branches with thousands of employees as a consequence of a system for the results of its mato system. Mato is local language that means partnership with profit sharing, and mato system is payroll system that the employees do not get salary monthly, but they earn money based on profit sharing once three months. In the free trade era, business competition is climbing, anyone and from any country can open a business and enter competing in one country [1].

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1.1 Mato System
As stated by Hanif, Ludigdo, Rahman, and Baridwan [2] and Hanif [3][4] that the profit sharing of the mato system is different from the conventional business system, the profit sharing of the mato system can be described as a business system in which stakeholders do not get wages and salaries, but they receive income based on profit sharing on "profits" obtained of reporting period. Profits are calculated from total sales minus cash expenses to get "gross profit", then "gross profit" is reduced by 2.5% for charity, and "gross profit after deducting charity" is reduced again 10% of it for "depreciation" of investment to be returned to investors as investment owners..

The rest is "net income" that is ready to be divided based on the composition of the mato (weight points) that are owned by the three parties, namely: employers, investors, and employees depending in accordance with the ownership of mato. Stakeholders get the income with a ratio of 10: 7: 3 for employees, investors and managers (brand owners). At the employee level, the distribution of profits is distributed again based on the mato weight of each employee [2].

Hanif et al [5][6] argued that the uniqueness of Padang Restaurants in general, including “Restoran Sederhana (Sa)” is using a dish system in serving customers rather than based on the order system as usual of restaurant services. With the dish system, once the restaurant customers arrive, they are immediately served food consisting of rice and side dishes, and hot tea, without ordering in advance. So, there is no previous transaction. Calculation of each item consumed by customers is done after they finish eating. Food is identified and counted into a bill, is only the food that is consumed. Non-edible food items are returned to the food storefront that is called Paluang in local language. The chosen dish system is the aim to respect the customers by the restaurant, and the customers do not pay any food that is not eaten.

According to Hanif et al [6] the management raises its own complexity in administration, especially financial administration, and the restaurants has grown to hundreds of branches, and using mato partnership system. The network starts to open branches abroad, involving many investors in each branch, and thousands of employees. The financial administration management is still done manually, and the result of calculation can be presented every three months. The manual process in calculating profit sharing takes time, that is why it is done once three months. If it is done every month, it will disrupt the operational activities of each branch of the restaurant. The impact of the result of carrying out every three months is need too long period, especially for the employees whose income is needed by their household. Employee

thinks that it should be better to distribute the results every month as usual payroll in general restaurant. The distribution of income every three months raises additional problems in financial needs of Sederhana Restaurant employees. One of the problems is to give loans to employees before the revenue sharing is carried out, and they have to pay the debt that reduces their income.

The service to customers should focus on the their needs including culture and lifestyles. Lifestyles is changed in accordance to the development of technology [7]. Internet is used in everyday life by anyone and anywhere, especially mobile phone. Mobile phone is very important and estimated 62.9 percent of the population worldwide already owned a mobile phone in 2016. The number of mobile phone users in the world is expected to pass the five billion people by 2019. The mobile phone penetration is forecasted to continue to grow, rounding up to 67 percent by 2019 [8].

1.2 Mobile Technology

The rapid of technology has been growing fast including mobile technology throughout the world is a phenomenon that has been implemented among people, largely because of the prepaid model. Everyone can access to financial services as people become increasingly familiar with a mobile-money system. Mobile technology has viewed as a payment or banking channel, has the potential to allow two important questions to be addressed at the same time: (1) On the demand side, it represents an opportunity for financial inclusion among a population that is underserved by traditional banking services; and (2) On the supply side, it opens up possibilities for financial institutions to deliver a great diversity of services at low cost. [9]

Quick Response Code (QR Code) is a two-dimensional bar code that was developed by Denso Wave in 1994. QR code is widely used to encode types of information such as timeline for events, intel for communication, location, email, phone numbers, SMS message. QR code can store more information than traditional bar code [10]. Due to a wide variety of information and easy accessibility, QR code has been being widely utilized in different fields of management and business. It has currently been applied in various field such as management information systems, online marketing, e-commerce's and mobile payments. In general, QR code has been a convenient method for tracking items in processing chains; fill the gap between customers and producers. [11]

The management system is designed as a client-server model as can be seen in Figure 1. The main server will be installed and managed by the Ministry of Industry and Trade to manage the centralized database. The secondary servers will be located in Sederhana Restaurant management to manage the local data and synchronize with the main server. The server system connects to other information management systems such as the national database of residents to collect personal information of store owners and the centralized Tax Management System for taxation, banking system and direct payments to pay taxes and fees online. Clients install the application on their smartphones that support QR code reading and server connection via the internet. These applications are available on the App store or Google store. Point of sales equipment will be specifically programmed to print invoices and accept multiple forms of payment online. [12]

The objective of the research is developing QR payment system that customers can pay the bill using QR code in anywhere of Sederhana Restaurant. Using the new system, many advantages are gained by either restaurant network or customers: (1) Managing the financial system at Sederhana Restaurant network easily; (2) Payment convenience for customers; and (3) Decrease the cost in restaurant management.

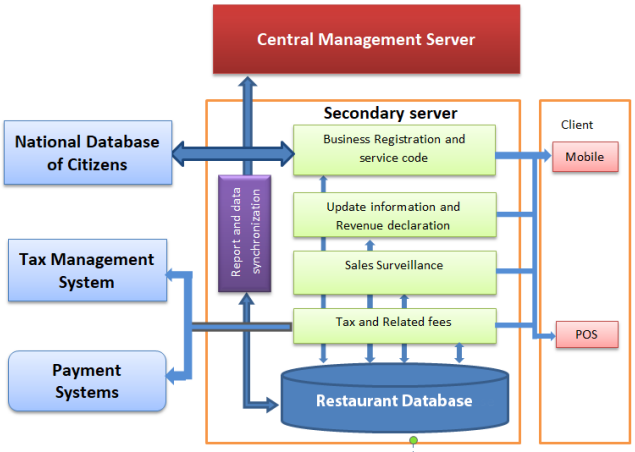

Figure 1. Infrastructure of online payment [12].

Because recording food items is done after the customer has finished eating, the bill payment is made after the eaten food listed. Then, QR Code follows the "business rhythm" of Simple Restaurants (Sa). So, the procedure for implementing the QR code, it seems, that the results of recording the food consumed by the customer and recorded by a note taker. The eaten food list is submitted to the cashier by a note taker. The cashier inputs the data and issues a bill. Using smartphone, the customer uses the QR code to pay the bill, which is also part of the customer's bank balance will automatically decrease [13], and move directly to the Simple Restaurant account.

2. METHOD

2.1 Research Design

Authors use System Development Life Cycle (SDLC) [14], that is divided into 6 phases. They are Planning, Analysis, Design, Implementation, Maintenance, as can be seen in Figure 2. The system-development life cycle enables users to transform a newly-developed project into an operational one. The System Development Life Cycle, "SDLC" for short, is a multistep, iterative process, structured in a methodical way. This process is used to model or provide a framework for technical and non-technical activities to deliver a quality system which meets or exceeds a business's expectations or manage decision-making progression.

SDLC that contains seven phases can be described as follow: (1) ***Planning***. The first phase in the systems development process can identify whether or not there is the need for a new system to achieve a business's strategic objectives. It is a feasibility study for a company's business initiative to acquire the resources to build on an infrastructure to modify or improve a service; (2) ***Analysis***. The second phase displays the organization with its problems, and the need for a change. This is where organization consider the functional requirements of the solution. It is also ensuring the new system to meet the expectations; (3) ***Design***. The third phase describes the necessary specifications, features and operations that will meet the functional requirements of the proposed system. This is the step for end users to discuss and determine their specific business information needs for the

proposed system. During this phase, the important things to consider are hardware and/or software, networking capabilities, processing and procedures of the new system; (4) ***Implementation***. The fourth phase is when the majority of the code for the program is written. It involves the actual installation of the newly-developed system. This step puts the project into production by moving the data and components from the old system and placing them in the new system; and (5) ***Maintenance***. The fifth and final phase involves maintenance and regular required updates.

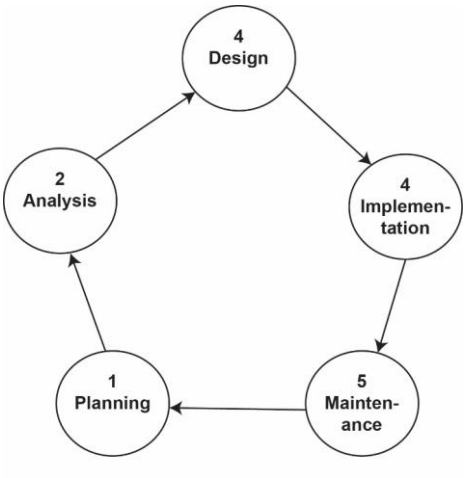

Figure 2. Research design SDLC [14]**.**

2.2 Location

The respondents of the research are customers and stakeholders (employees, investors, and brand holder) of Sederhana Restaurant network that use run the system. The restaurants with variety scales are located in many locations

2.3 Data Analysis

The data is analyzed using the analytical descriptive method and interpreted in a narrative way based on the research findings. Analyzing and data processing carry out with six stages including data gathering, preparing data for analysis, careful reading, developing the code, presenting the data and analyzing the data [15]. Data is collected from interviews and questionnaires with details: (1) Questionnaires with open-ended questions are used to find useful information that support the theory, the information is needed for model development, information whether customers and stakeholders can perform the command to use the mobile application, as well as assessing the other menu on mobile phone that is developed, (2) Interviews with open-ended questions are used, hence respondents can give information that is not limited from different perspective [16] . Depth interviews are necessary to obtain data about the product and the process to do online payment.

3. DISCUSSION

Discussion involves Planning, Analysis and Design that have been conducted, can be described as follow.

3.1 Planning

Payment system at Sederhana Restaurant network had to be paid more attention when it was not flexible and fast, because the system was done manually and caused many problems. In order improving the service to customers, at Sederhana Restaurant network could not make customers very pleased without using new technology in payment system to meet the lifestyle of customers. Several questions as can be seen in Table 1 are used to find the requirement of the system Table 1.

Table 1. Questionnaires used in the first phase

1. People need interactive media using smartphones, playing game, funding information, shopping, but some people still using for communication only. How about you?
2. Some people like to bring money with them, and the others prefer provide with credit card and debit card. What about you?
3. There are many payment methods debit card, credit card, transfer, and QR payment, but some people still prefer pay in cash. What are you custom in?
4. If you compare digital payment with cash payment, could you explain which one is interesting and easy to use?
5. About QR payment is a new payment method, could you explain how it is easy and convenient to use?

Data was collected from customers, employees, investors and brand holder of Sederhana Restaurant network in Jakarta. After processing the data, the payment model may be designed. In answering the questions in Table 1, majority of the respondents stated the following statements in Table 2.

Table 2. Research findings after data processing

1. Most of the respondents preferred smartphones to get information, and several ones used it for shopping.
2. Most respondents preferred keeping card than money when they were out of home.
3. Most of respondents preferred pay in cash when shopping, but several ones pay using card, and only a part of respondents use smartphone to make payment.
4. Most all respondents were custom in using card to make payment, and some agreed that it was easy to use.
5. Most respondents stated that QR payment was convenient, easy to use, and would be broad to be used..

3.2 Analysis

The second phase was analysis that using questionnaires, and deep interviews, researchers got the requirement for developing the payment system. The requirement of the system can be describe as follow:

Software infrastructure:

Special designed system. The system is developed especially for the Sederhana Restaurant network
Database of the restaurant that support the restaurant system especially billing system that is connected with banking network
Internet connection that is used for communicating with online payment system using QR Code

Hardware infrastructure:

A smartphone equipped with QR code scanner software. New smart phone can be provided with scanner application software by downloading from Play Store and App Store

3.3 Design

Since the system had to be changed from manual to mobile-based, researchers used the same data flow diagram that were used in the old system. Relationship between the entity (customer and management) and the billing system is presented in in Figure 3.

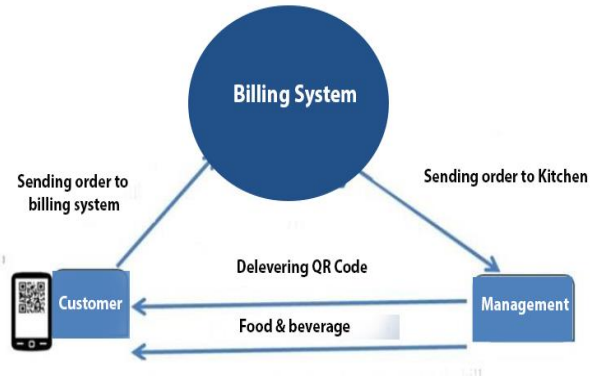

Figure 3. Payment using QR.

Completing the design system, it was made on database design with tables that provided with attributes, and its type, length and description. Database design was the organization of data according to a database model. The designer determines what data must be stored and how the data elements interrelate. With this information, they could begin to fit the data to the database model. Database design involves classifying data and identifying interrelationships. [17]. Based on entity and relationship diagram, there were two entities and one relation.

4. LIMITATIONS OF RESEARCH

Limitations of research in model development: (1) The research and development that consists 5 phases is still in progress, and only the first, second and third phase has been conducted: and (2) The third phase Design is in progress.

5. CONCLUSION

Based on the objectives and the results obtained in this initial study, it can be concluded as follows: (1) Managing payment can be supported using QR with computerized system [18]; (2) The information derived from the initial research was used as a guideline for improving the restaurant services; and (3) The Development of QR payment was carried using System Development Life Cycle (SDLC).

For future work, the design of QR payment system should be continued producing and implementing in the QR payment system in next phases of this research.

6. ACKNOWLEDGMENTS

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