

Effectiveness of the E-Ticket System Using QR Codes For Smart Transportation Systems

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Abstract.

The background of this research is to know the effectiveness of using QR codes for E-ticket payments in the ticket booking system in the transportation sector, by providing easy payments to the public, it will be able to facilitate ordering and payment of tickets, therefore it will be able to increase ticket sales. The research method used is to use the literature review method by reviewing many journals and finding the latest research problems so that the research carried out becomes renewable research and can solve the research problems raised. The problem raised in this study is by analyzing the effectiveness of using QR codes, data obtained from previous research studies, by conducting literature reviews, will be able to find problems and solutions from the research raised. This research will produce a system proposal that will make it easier for the public to use the ticket payment system, the use of QR codes will simplify transactions and speed up the payment process.

Keyword : Effectiveness E-Ticket, QR Codes, Smart Transportation, Systems.

I. INTRODUCTION

An effective public transport system is seen as a fundamental requirement for modern society, not only to meet basic mobility requirements, but increasingly ensuring that time, resources and assets are used efficiently so as to minimize negative impacts on the environment. a system for online ticket generation and sales. Users can easily book and book tickets to online cultural or sporting events, pay for them online, then print their e-tickets on the home printer and head straight to the event venue[1]. No need to wait in line or be stressed about getting tickets right before the event. Everyone needs to queue to buy tickets. With technology advancing so rapidly, this must change too. The new technology should be upgraded and adopted soon with online technology and payment gateways that will come through the market and become a huge success. In recent years there have been more advances in technology[2].

The method used in this research is to conduct a literature review, by reading many journals that have the same research as this research[3], by reading a lot you will be able to find the latest problems and this research can be the latest research[4]. The purpose of this research is to raise the issue of the effectiveness of the QR Code, in the application of purchasing E-Tickets in all modes of transportation that have developed into smart transportation, with the development of the system that will be able to help the public in using public transportation[5].

This research will produce a system proposal that will develop a smart transportation system pasa system, using the QR code payment system, with the proposed system making it easier for the public to make payments in the transportation sector[6].

II. METHOD

a. Literature Review

This study aims to evaluate the implementation of the Rail Ticket System at PT. Train at Malang City Station. Information System Success DeLone and McLean which has six dimensions to measure the success of an information system. From the results of the evaluation it is known that PT. Kereta Api Indonesia has implemented the Rail Ticket System successfully because all users have positive perceptions on all factors in these six dimensions. The success factors found in implementing the Rail Ticket System include supporting ticket purchase activities, data integration of all online stations, the display supports users, the available features are quite complete, can provide information to passengers clearly and accurately, greatly impacting individual performance. and an adequate organization and reporting system[7].

This research will encourage bus companies, especially in Medan, to include the e-ticket bus system in the army which is now being used to repair and improve transportation services. Mobile ticketing for buses was developed to help passengers book their tickets via Mobile devices. The business model that is built can provide benefits for companies and passengers. Transportation services may be available to users anywhere, anytime and any equipment to book bus tickets[8].

An identity-based identifier system is available whereby the user's device sends a challenge to a terminal: all of this updates the filter based on the challenge and sends the contents of the filter to the user's device. The user device sends the filter contents, associated with the device and terminal, to the backend server; And the backend server gets from the content of the filter information about user behavior[9].

Various technologies for operating the electronic game machine (EGM) were disclosed. EGM may take the form of (a) a communication module; (b) ticket virtual interface converter module; (c) input devices; (d) means of payment; (e) payment devices; (f) memory devices; and (g) executing processors stored in memory devices. The processor, when executing the instructions stored in the memory device, can intercept communication between the input device, the payment device and the payout device using the virtual ticket interface converter module so that financial transactions between the player and EGM are channeled through the virtual wallet interface converter module accounts proving financial transactions by EGM is as if financial transactions were carried out physically using payment instruments[10].

The addition of e-Construction and other advanced technologies can significantly increase the efficiency and safety of road paving operations, particularly paving inspections. Activities such as collecting load tickets, tracking pavement laying temperatures, and monitoring roller movement are ancient practices practiced by DOT inspectors during paving operations. E-Ticketing, Paver Mounted Thermal Profiling, and Intelligent Compaction are plans for automate paving inspections and were recently tested in two pilot resurfacing projects in the state of Kentucky. The findings from the project indicate that the three technologies show great potential in improving the safety and efficiency of paving inspection. The contribution of this thesis is to document research efforts, evaluate the effectiveness of technology compared to traditional practices, and discuss lessons learned for industry practitioners[11].

Internet-based travel e-ticketing became popular in 1998, more than two percent of the tourism market is transacted via the Internet. Analysts expect a 7.5% increase annually. From previous research, 95% of internet users use the internet to search and collect information related to tours and trips. Today's business environment has changed and information technology has challenged the tourism business in the distribution and sale of tourism products. The implementation of e-commerce e-ticketing in the field of tour and travel is in booking flights, hotel bookings, and car rental. According to data from the Indonesian Ministry of Communication and Information Technology in 2014, the activity of buying and selling goods and services in Indonesia is in second place after social networking activities[12].

For them, e-tickets have become a cost-effective way to save money. In order to increase internet ordering in Malaysia, it is important to understand the factors that influence consumer purchase intentions.

However, there is limited academic research in Malaysia. Based on the Technology Acceptance Model, this study investigates the effect of perceived ease of use and perceived benefits of purchasing online airplane tickets. The results of the study indicate that perceived usefulness has a significant positive relationship with purchase intention, and that perceived usefulness fully mediates the relationship between perceived ease of use and purchase intention[13].

Computer-implemented methods for paperless electronic m tickets are available. This method includes reading, by the user's device processor, the electronic ticket code displayed on the ticketing device, the electronic ticket code which has the information and instructions for the electronic ticket code, by the user's device processor, the information and instructions in the electronic ticket code, and transmitting, by the processor. the user's device, signals to the sensors on the ticketing device to get an electronic ticket. Computer systems and products for paperless e-tickets are also provided[14].

The aviation industry is one of the fastest growing industries in the world. The airline industry ticket distribution channel has changed to e-ticketing. This distribution channel provides customers with the ability to purchase e-tickets quickly and has cost saving benefits for both the company and the customer as well. Although virtual distributors on the internet have raised concerns about issues such as security and trustworthiness, e-ticketing has still proven to be one of the most important channels for airlines to sell tickets[15].

In many public transportation systems, people have to stand in line to buy tickets such as trains, airports, bus stops, etc. With technology advancing so rapidly, this must change. E-Ticket is a system for creating and selling online tickets. Users can easily book and book tickets to cultural or sporting events online, pay online, then print their e-tickets on the home printer and head straight to the event venue. And an efficient electronic ticketing system using QR codes has been proposed[16].

The traditional paper-based ticket system used to track trucks loaded with construction materials has some major problems, such as theft, extension of travel time, risk of injury when collecting tickets, illegible records due to mutilated tickets, etc. Using digital technology to increase its productivity, that is, implementing e-tickets or e-tickets instead of paper-based tickets, can make a real difference in the delivery of construction materials[17].

An exemplary system for distributing promotions in relation to digital tickets could include staff devices with memories that store information about at least one attraction and prize related to the promotion, and a communication interface that sends offers to one or more communication devices regarding at least one promote, as well as The server, which receives information from the communication device of one of the guests, analyzes the information received to determine whether the guest has met the promotion requirements at the attraction within a predetermined time[18].

Exemplary systems for tracking real-world activity can include databases and servers in communication with guest communication devices. Such databases can store digital tickets for individual guests at a venue, as well as information on a number of real-world activities each determined based on one or more conditions and tied to a predetermined prize. The server can include a communication interface that receives information captured by an active communication device from one of the guests and a processor that executes instructions to analyze the captured information to detect one or more conditions associated with one of the real-world activities and to update the digital ticket associated with it. active communication device regarding the prize that has been determined. Notifications can then be sent to active communication devices regarding the rewards[19].

The ticket system process is a technically regulated procedure. With a ticketing system, user submissions become tickets that will be forwarded to be followed up by the IT Helpdesk and IT Officer. Activities in ticket management generally consist of collecting ticket data as a whole, receiving tickets, receiving tickets, delegating tickets to closing tickets. Then for the current system, to send tickets through the system but still use documents for ticket delivery attachments. This is considered ineffective even though the document is still frequently used for audit purposes. This web-based Helpdesk Ticketing application is an application built as a ticket delivery tool

in a system and to facilitate and can be used as a communication channel by the IT Department with users, in terms of supporting the provision and use of related facilities for systems and technology to evaluate problems that often occur. This application design uses UML diagrams and SWOT analysis. Applications are made using PHP[20].

The current public transportation system such as buses or subway trains which can be called MRT / LRT is facing a problem, namely charging an uncomfortable balance. Bitcoin, a fairly neutral and safe payment system, is widely implemented in public transportation. With the payment method via Bitcoin so that people no longer feel disadvantaged or afraid. In China, the public transportation payment system already uses Bitcoin but it can only be done to certain cities, not anywhere. Bitcoin has a complex transaction verification mechanism and does store its data in disbelief[21].

b. Research Method

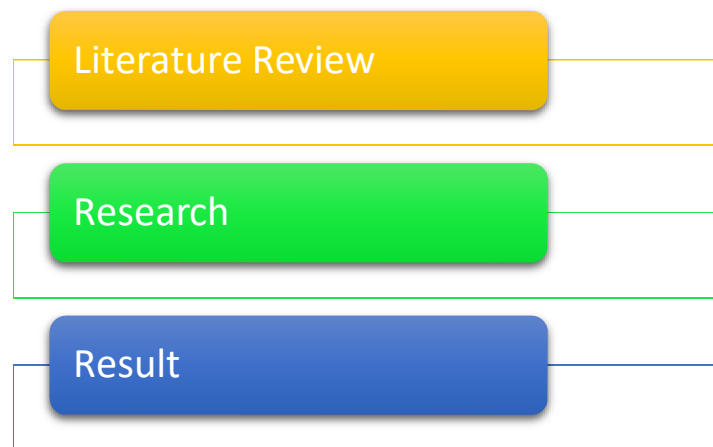


Fig 1. Research Method

Based on the image of the research method above, it can be explained that this study uses the literature review method based on previous research so that it can make a new system proposal for ordering tickets based on QR codes[22], after conducting a literature review, the researcher conducts research until the research is complete and produces a system proposal that can answer research problems raised in this study[23].

III. RESULT AND DISCUSSION

QR e-ticket system is mainly for buying the most challenging bus tickets. This bus pass ticket can be purchased only with a smartphone. application, where they can carry there smart phone bus pass tickets as QR (Quick Response)[24]. Customers can register for the pass by specifying the source and destination. This application will generate a QR code according to the information entered by the user and which will be used by the conductor or authorized person to scan the ticket. Each user's information is stored in a SQLite database for security purposes. The ticket checker is also equipped with an examiner application to search and check user tickets for inspection purposes[25].

SQLite implements most of the SQL standards, which use a dynamically typed, weak SQL syntax that does not guarantee domain integrity. SQLite operations can be performed multi-tasking, although writing can only be performed sequentially. The source code for SQLite is in the public domain. SQLite has many builds for programming languages. It is the most widely used database, the most widely used database engine[26].

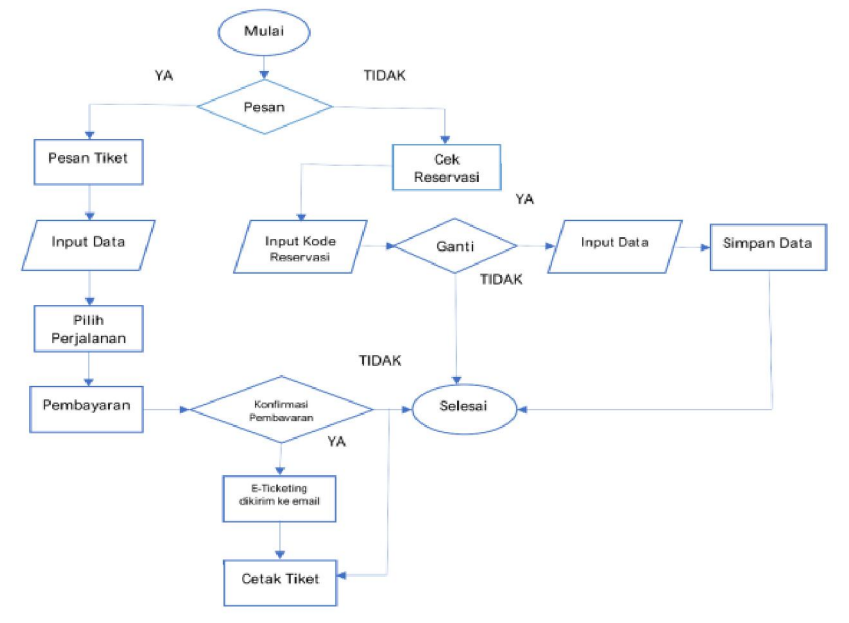


Fig 2. Flow Chart

Explanation:

1. Start

2. Message

- If yes, enter the ticket order process, input data, select trip, payment, confirm payment
- If done, the ticket will be sent to email, and ticket print, done
- If not done, then immediately finished
- If not, it will enter the reservation check process, input the reservation code, change the trip
- If yes, then input data, save data, and finish
- if not, then done

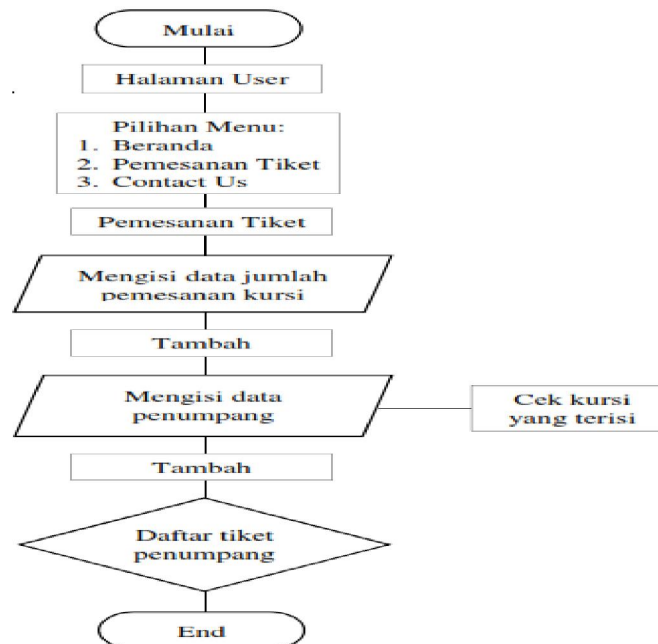


Fig 3. User Flow Chart

Explanation:

1. Start
2. Select Menu
3. Ticket reservations
4. Fill in passenger data
5. List of Passenger E-Tickets

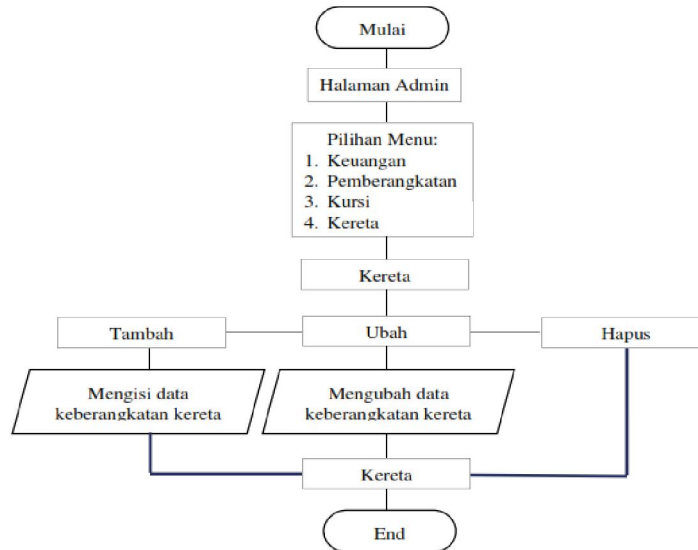


Fig 4. Admin Flow Chart

Explanation:

1. Start> Admin menu> Fill / Change passenger data
2. End



Fig 5. Business Process

<http://ijstm.inarah.co.id>

Explanation:

Find the ticket you want => Pay => Print QR Ticket => End

IV. CONCLUSION

Purchase of RFID tickets, GPS, WIFI, AZTEC codes are used but there are some drawbacks to this technique. QR-based e-ticketing system uses the QR code concept. QR codes are two-dimensional fast response codes that are now gaining fame and popularity in the United States. They are easy to use and versatile. The main advantage of this code itself is that it is storing a large amount of information that is easy to scan and save to a mobile device.

This system allows people to register for a bus pass. It also allows the user to update the pass by updating the details. This system uses a mobile android application for bus passes. Passengers and ticket checkers will have an android app. Passengers want to enter basic information such as name, address, banking details, source and destination, etc. which are stored in a database and generated in the form of a QR code. Scan QR code ticket checker via android app and hence validation will be checked through it.

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