

# E-Ticket Application as Supporting Technology during COVID-19 Pandemic in Baluran National Park

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**Abstract**—The COVID-19 outbreak has a major impact, especially on tourism. Closure of tourist attractions must be enforced to prevent the spread of the virus. People are required to maintain a safe distance and avoid crowds (physical distancing). Some policies and guidelines are created to adapt to the new normal era to drive and stabilize the people's economy during this pandemic. Tourist attractions start operating with government guidelines, including limiting the number of visitors and implementing supporting technology to prevent queues of visitors when purchasing entrance tickets. This study develops a web-based system to facilitate ordering tickets through a web-based system, uploading proof of transfer, and obtaining e-tickets to be shown to ticket officers. Extreme Programming model was used. The e-ticket system has been tested at Baluran National Park using the Blackbox method, showing that the system has the functionality to meet user needs.

**Keywords**—Web-based e-ticket; Baluran National Park; tourism; extreme programming; blackbox method

## I. Introduction

The global COVID-19 pandemic greatly affects various sectors, one of which is tourism. The government must impose closure of tourist attractions to prevent crowds and new clusters of the spread of the virus. This leads to the adaptation and limited reopening of many tourist attractions; one of which is Baluran National Park. Baluran National Park is one tourist destination with various landscapes ranging from marine, mountain, and savanna ecosystems, as well as various types of protected animals and plants. This park has diverse tourist attractions, such as Gua Jepang, Curah Tangis, Sumur Tua, Evergreen Forest, Bekol, Bama, Manting, Dock, Kramat, Kajang, Balanan, Lempuyang, Talpat, Kacip, Bilik, Sejileh, Teluk Air Tawar, Batu Numpang, Pandean, and Bang Temple [1].

With its tourism services, this tourist attraction is often visited by both local and foreign tourists. To enter Baluran National Park, visitors are required to complete personal data, type of visit, the vehicle used, and the number of group members in anticipation of illegal hunting activities as prohibited by the law.

The problem is the visitors must queue for a long time when purchasing tickets while the management must spend a large amount of budget annually for ticket printing. One of the solutions used is to switch from the conventional ticket purchasing system to a computerized system. A study entitled “Designing a Mobile Web-Based E-Ticket Reservation System for Tourism in Lampung” developed a system using the mobile web to enable tourists to access applications [2]–[4]. However, some disadvantages of wrong payment systems and conventional data collection were still found.

In this study, a web-based application was developed to accommodate online entrance ticket reservations and to generate electronic tickets. This app features ticket data management system, entrance ticket revenue, and periodic reports on the number of visitors. It is expected to facilitate entrance ticket service and periodic report recapitulation.

## II. Research Method

Extreme Programming (XP) development method was used in this study. XP is a software development engineering process using an object-oriented approach, with small to medium team building. This method is

suitable for use by a team with undefined needs or rapid changes in needs [5]. In this study all programming are developed using Bahasa Indonesia as it used for the Indonesian application only.

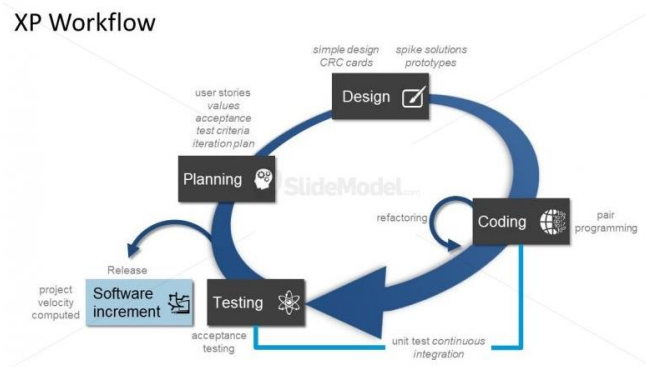


Figure 1. Extreme Programming Method

The stages of the XP method are as follows:

#### A. Planning

System development begins with understanding the context, defining outputs, features, functions, determining development time and costs, and the flow of the application development process. At this stage, direct observations were made in the Baluran National Park to obtain information related to the system requirements to be developed. In this study, Usability Testing model was employed to analyze the data in obtaining user perceptions to determine the usefulness of the application during the pandemic.

#### B. Design

It includes the creation of database, activity diagrams, and user interface design using MySQL workbench 8.0 CE for designing the database and draw.io for making activity diagrams.

#### C. Coding

The development of the e-ticket system is based on the predetermined design at the system design stage. For programming language, PHP with Laravel Framework version 7, MySQL database was used, and Xampp was used as the webserver to run the system.

#### D. Testing

At this stage, the features of the system were tested by involving the user to ensure that the system is running according to user needs. The system was tested using the Blackbox method to determine whether the system runs according to its functionality [6].

### III. Results and Discussion

#### A. Requirement Analysis

Requirement Analysis was conducted by interviews with users and direct observation to find out the current work system, the existing problems, and solutions to these problems.

#### B. System Design

An overview of the flow of the e-ticket system in this study is shown in Figure 2.

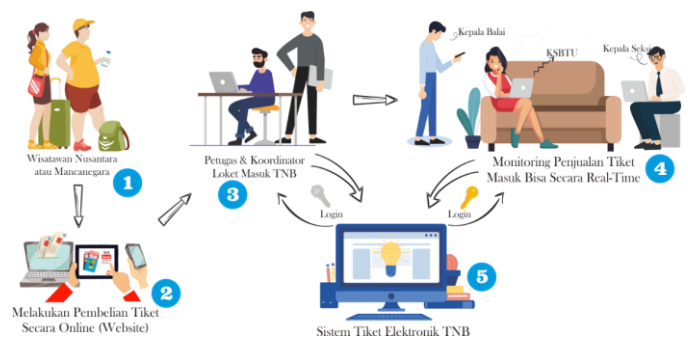


Figure 2. System Architecture Design

It shows that tourists only need to access the e-ticket system via a smartphone or laptop connected to the Internet. The reservation is carried out by entering personal data and uploading proof of transfer. After that, the ticket officer and coordinator will validate the proof of transfer uploaded by the visitor. The visitor will then receive a notification indicating that the ticket purchase transaction is successful, and they will get an e-ticket to show to the counter clerk at the entrance to the tourist spot. The ticket officer will scan the e-ticket, and the system will automatically save the visitor's data.

Figure 3 shows the process of ticket reservation by visitors (local and foreign tourists). The visitor must select a visit date, and the system will display the limit on the number of visitors on that date. During the

COVID-19 pandemic, the management of Baluran National Park imposes a limit on the number of visitors to less than 500 people per day. The activity diagram is used to show activities that occur between users and the system [7].

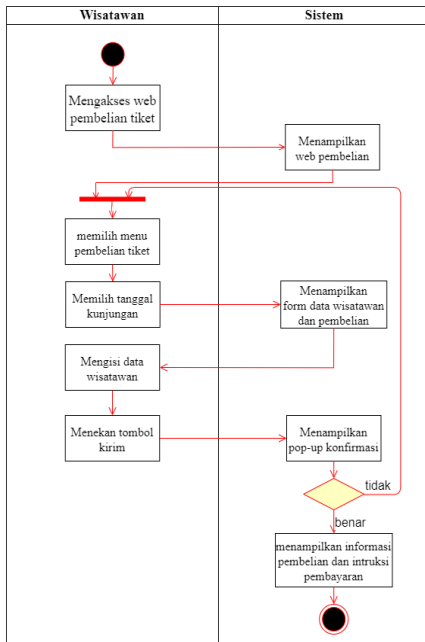


Figure 3. Diagram Activity

**C. Database Design**

Entity Relationship Diagram (ERD) was used to design the e-ticket system database. This diagram is used to show relationships between entities [5].

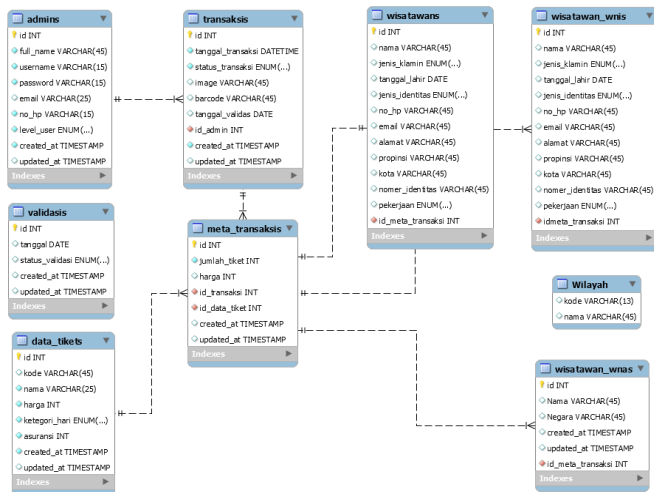


Figure 4. Entity Relationship Diagram of E-ticket System

**D. E-Ticket System**

The outputs of this study are an e-ticket system developed using the Laravel PHP programming language framework and database management using MySQL. Figure 5 is the front page of the e-ticket system in Baluran National Park. Point 1 is the menu for potential visitors who will book tickets. Point 2 is a feature for searching and checking the reservation status by entering the ticket reservation code. Point 3 is the navigation button to access the ticket reservation menu.



Figure 5. The Main page of Baluran National Park E-ticket System

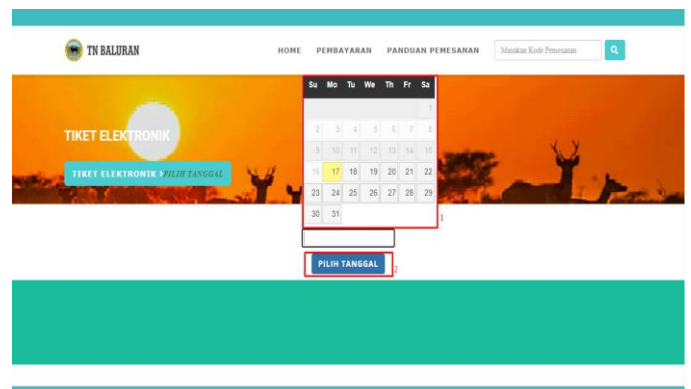


Figure 6. Selection of Visiting Date

Ticket reservation at Baluran National Park is performed via this application by selecting the visit date on the page shown in Figure 6. This page has several features, including a feature of selecting a visit date before filling out the registration form (point 1) and a select date button to proceed with the transaction after selecting the visit date. This page also determines the entrance fee for potential visitors; when they choose a public holiday or Sunday, the holiday rate will be

applied. They are charged a weekday rate where holiday tickets are more expensive than weekday tickets.

After selecting a date, the user is then asked to fill in the personal data of potential visitors. This app also provides individual and group reservation system. On the reservation page, visitors are asked to fill in the data on their vehicle and personal data of the leader and his/her members. This applies to local and foreign visitors. After that, the e-ticket reservation is finalized as shown in points 5, 6, and 7 in Figure 7. The visitors then upload the proof of transfer to be checked by the ticket officer. Figure 8 is an example of an email sent by the e-ticket system to potential visitors who have made a reservation and have been verified by the ticket officer or coordinator.

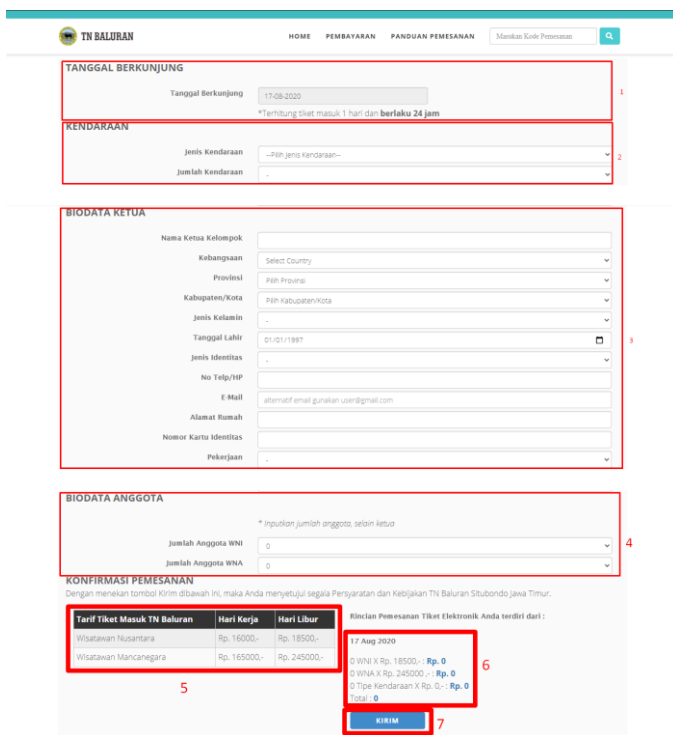


Figure 7. Reservation Page

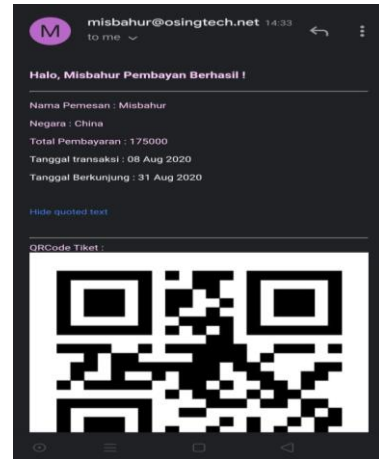
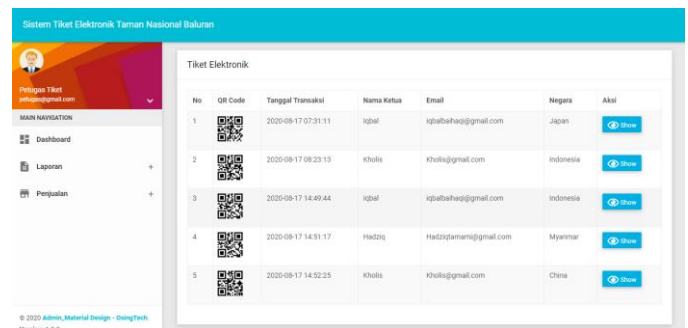
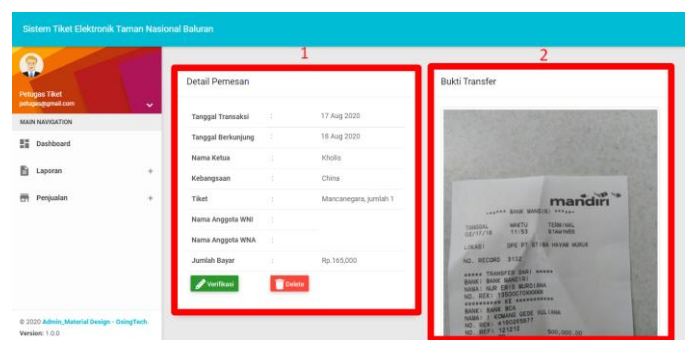


Figure 8. Email for Ticket Reservations

Next, a list of all ticket reservation transactions will be displayed on the ticket clerk's user page as shown in Figure 9. Figure 9.a is the transaction page for the reservation, and 9.b is the transaction detail page. In the figure, there are two points displayed; point 1 is the transaction detail, and point 2 the proof of transfer uploaded.



(a)



(b)

Figure 9. The Reservation List Page of Potential Visitors of Baluran National Park

### E. System Testing

The testing results (Table 1) using the Blackbox method show that all the features of the e-ticket system have run according to user needs.

Table 1. Result of Black Box Testing)

Testing Scenario	Test Case	Expected Result	Testing Result	Status
Selection of date on weekdays	Date: August 19, 2020 (Weekday)	The system displays weekday entrance fee	As expected	Valid
Selection of date on public holidays	Date: August 20, 2020 (Public holidays)	The system displays public holiday entrance fee	As expected	Valid
Filtering ticket transaction reports	User level: officer, 1-week transaction	The system displays transaction data for the last 1 week	As expected	Valid
Tourists book tickets	Individual reservation	The system displays individual vehicle and personal data forms	As expected	Valid
Tourists book tickets	Group reservation	The system displays the forms of the vehicle and the personal data of the leader and his/her members	As expected	Valid
Tourists upload the proof of transfer	Uploading proof of transfer	The system will display a success message if the uploaded proof of transfer is an image with a size of not more than 5 MB	As expected	Valid
Ticket officers make offline transactions	User level: Offline Reservation Officer	The system will display a message of successful reservation if the ticket officer has entered the data correctly	As expected	Valid
The system sends an email	User level: Online Reservation Verification Officer	The system will display a message of successful verification if the officer has pressed the verification	As expected	Valid

Testing Scenario	Test Case	Expected Result	Testing Result	Status
		button		

User perceptions were obtained using the Usability Testing model with the application detail test observation model on the impact of the pandemic in Baluran National Park. Testing was performed using a questionnaire distributed to the employees and some tourists in Baluran National Park.

Table 2. Result of Usability Testing

No.	Question	Mean Score
1	Is the information in the app easy to find?	3.94
2	Is the writing easy to read?	4.2
3	Are the app features helpful for you to run the app?	4.38
4	Is the app helpful for ticket reservation?	4.3
5	Are you satisfied with the information provided?	4.04
6	Are you generally satisfied with this app?	4.12
7	Please rate the level of ease of use of this app.	3.90
<b>Total Mean Score</b>		28.88
<b>No. Questions</b>		7
<b>Mean Score/No. Questions</b>		4.125
<b>Rounding</b>		4

## IV. Conclusion

In this study, an e-ticket system has been developed to manage the data on the tickets and visitors of Baluran National Park. The management can manage ticket and visitor data and get information on the number of ticket sales revenue and the number of visitors periodically. Tourists can find information about the facilities and types of tourist attractions in Baluran National Park as well as the entrance fee based on the type of vehicle and the number of visitors. Besides, they can get the information on the opening/closing of the tourist attractions, make a transaction on ticket reservations, and get an electronic ticket as proof when entering the tourist attractions. The system developed is tested using the Blackbox method, showing that the system has met user needs in terms of functionality. The next development is the use of a payment gateway in the e-ticket system to enable the management to validate payments so that the buyers/visitors do not need to upload proof of transfer.



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