IMPLEMENTATION OF PROMOTION PUSH NOTIFICATIONS IN TICKET BOOKING APPLICATIONS USING FORWARD CHAINING ALGORITHM

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Abstract: Waterfall is a leading tourist attraction in Winongsari Village, Kaliwiro District, Wonosobo Regency. This waterfall, named Curug Winong, has become a developing tourist spot. This research contains the design and development of promotion push notifications using the Forward Chaining method which is intended to help determine promotions. This application was developed using the PHP programming language with a MySQL database. This application determines the promotion with the conditions that have been determined. Based on dates, holidays, and other applicable conditions. system testing, namely black box and white box testing.

Keywords: Push Notifikasi Promotion, Forward Chaining, Ticket

1. INTRODUCTION

Waterfall is a leading tourist attraction in Winongsari Village, Kaliwiro District, Wonosobo Regency. The waterfall named Curug Winong is a developing tourist spot, so this place needs support from the community to become a popular tourist spot in order to improve the economy of the local residents (Iradat, 2019). Since the COVID-19 pandemic, incoming visitor data has decreased significantly compared to before the COVID-19 pandemic, resulting in a decrease in the amount of income for both managers and local residents. Due to the lower public interest in traveling, it is necessary to improve the quality of marketing by implementing push notification promotions on the application for booking tickets for the Curug Winong tourist village to foster visitor interest in traveling and also to improve services to visitors.

Currently, the marketing pattern for the Curug Winong Tourism Village has been carried out through the website https://curugwinong.com, which contains basic features such as login, user, admin, homepage, register, booking, about, and contact. However, the website is not yet dynamic because it cannot contain incidental information and is not updated regularly, such as if there are new and fast promotions, it will be difficult to reach consumers immediately. In terms of marketing also requires additional strategies for example in receiving promotion information under any conditions and at any time (Salam, 2019). This is very necessary so that the main goal of a tourism concept where one of them is the high interest of tourists can be realized.

The application system was developed with a consultation approach related to the terms of the promotion, which was then processed to produce conclusions or results related to the determination of the promotion. For the right algorithm in this application system is to use a forward chaining algorithm. Forward chaining is a forward tracking method that starts from a set of facts by looking for rules that match existing assumptions/hypotheses to conclusions or results (Masya, 2016). Based on the description of the problem, the researcher wants to implement a promotion push notification feature on a web-based application system. Hopefully with this system it can help foster visitor interest and improve service quality.

2. METHOD

Research Flow can see in fig 1. In the process of collecting data and information, the author uses the method of literature study, observation, and interviews.
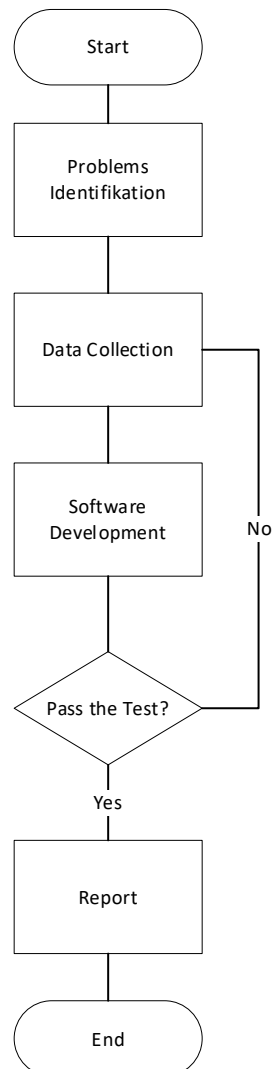

Fig 1. Research Flow

The following is an analysis of data requirements in the development of this website-based ticket booking application:

a. Product Data

In this analysis of data needs, there are 4 types of products, namely waterfalls, tubbing, rafting and flying fox.

Table 1
Product Name

Code	Product name
P1	waterfalls
P2	Tubbing
P3	Rafting
P4	Flying Fox

b. Package Data
Package Data is data that contains the merging of several product data into one. There are 4 data packages, namely outbound package, healing package, rah package, and all-in-one package.

Table 2
Package Name

Code	Package Name
G1	Outbound Package (fun game)
G2	Healing Package (Waterfall and Flying fox)
G3	Hura Package (Tubing and Rafting)
G4	All In One Package (Waterfall, Tubbing, Rafting and Flying Fox)

c. Promotion data
Promotion data contains discounted prices that will be given to transactions in accordance with the applicable promotion conditions. In the promotion data there are 2 promotion data.

Table 3
Promotion Name

Promotion Type	PROMOTION	PROMOTION CRITERIA CODE	PROMOTION CRITERIA
A	Promotion Free Day	D1	Holiday
		D2	Sunday
B	Promotion Event	D3	promotion period date
		D4	holiday celebration
C	Other Promotions	DI, D2, D3, D4	Holiday, Sunday, promotion period date, holiday celebration.

3. RESULT AND DISCUSSIONS

As a reference for making decisions in determining the Promotion, a knowledge base analysis is needed. Here's the knowledge base to determine promotion. Promotion type terms can see in table 4.

Table 4 Promotion type terms

Criteria Code	Promotion type terms		
	A	B	C
D1	*		*
D2	*		*
D3		*	*
D4		*	*

To produce the application of promotion notifications, it is necessary to have a knowledge base and a correct rule base in order to get a good and correct conclusion according to the facts (Domingue, 2018). The rule base is taken from the existing knowledge base, then compiled in the form of rules. Table of rule can see in table 5.

Table 5 Production Rules

Rule	Production Rules (AND)	
R1	IF	D1, D2
	THEN	A
R2	IF	D3, D4
	THEN	B
R3	IF	D1, D2, D3, D4
	THEN	C

A decision tree is a supporting tool with a tree-like structure that models possible outcomes (Aminanto, 2020). The decision tree in determining promotion using the forward chaining method can be seen in Figure 2.
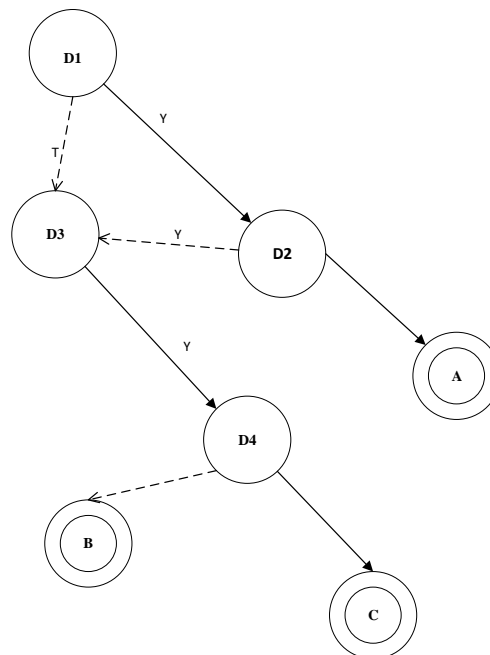

Fig 2. Decision Tree

Implementation of the Application of Push Notification Promotions on the Website-Based Application for Booking Tickets for the Curug Winong Tourism Village (WISCUNONG) Using the Forward Chaining Algorithm.
  a. Customer Main Page
      On this page, customers can see the main menu and some of the features on this website. Customer main page can see in fig 3.
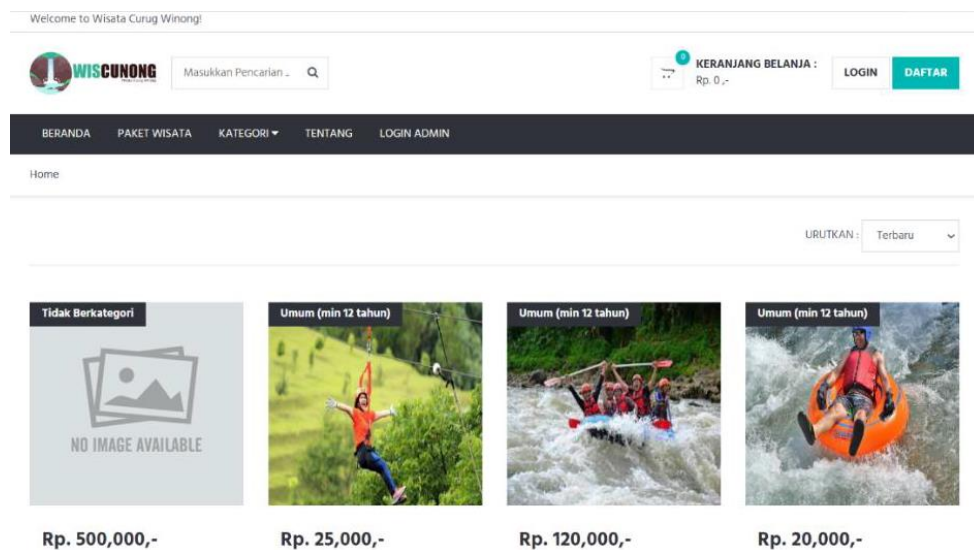
Fig 3. Customer Main Page

b. Package Name
    on this page, customers can choose the package name that suits them. Package name can see in fig 4.
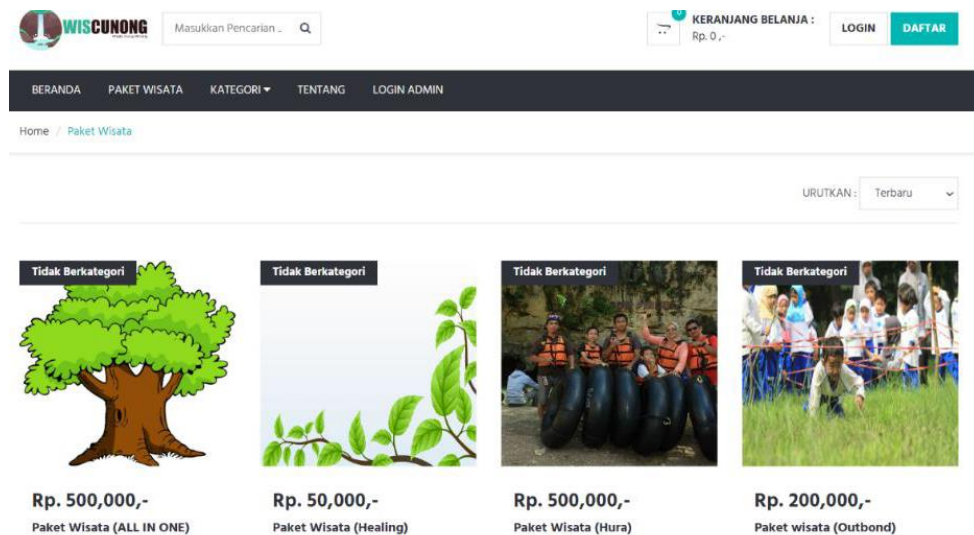
Fig 4. Packege Name

c. Push notification process
    in the push notification process, an smtp protocol is needed for sending email, the smtp protocol used is using google smtp. Push notification process can see in fig 5.

Fig 5. Push notification process

d. Promotional Push Notifications

if it is in accordance with the existing rules, a push notification will be sent via email. Email Notifications can see in fig 6.
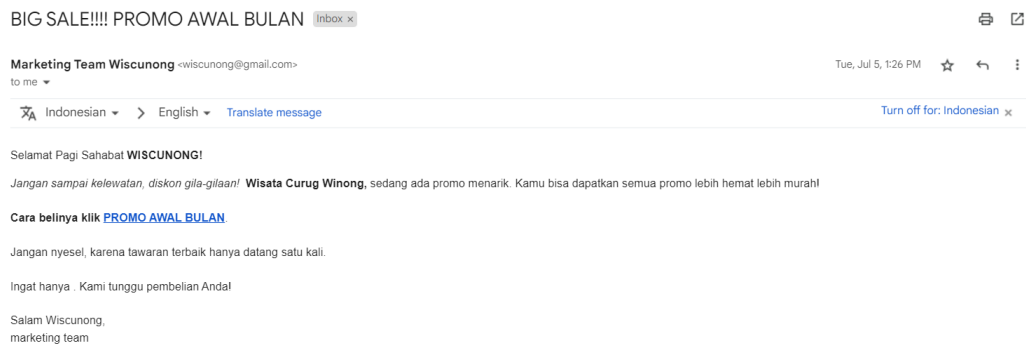

Fig 6. Email Notifications

Testing this system is done by testing Black Box Testing. Black Box Testing is a testing system for the way the system operates, where we can find out the system is running as desired or not (Rudin, 2019). The Black Box testing method is by running each module and then analyzing and observing the process or test results.

Num	Test Page	Testing Scenario	Expected results	Test result
1.	Customer Login	Enter the customer's email and password.	login is successful when data is correct and login fails when data is incorrect	OK
2.	Customer Main Page	Click the view feature in the product name section	Displays product name details.	OK
3.	Package Name	Select the desired package name by pressing the package name feature on the homepage	The data displayed is only the product package name available.	OK
4.	Customer– Promotion Notification	Click the promotion notification symbol then select one of the existing promotions, then select the name of the product	Add product name with promotion to shopping cart.	OK

		included in the promotion, enter it into the shopping cart.		
5.	Customer-shopping cart	Click the shopping cart feature	Displays the contents of the list of products in the shopping cart	OK

Based on the results of the tests that have been carried out, it can be concluded that some processes in the system may still have small errors. Because the black-box test does not display system testing in more detail. However, when viewed in terms of function, the application of push notification promotion on the website-based application for booking tickets for the Curug Winong Tourism Village (WISCUNONG) using the Forward Chaining algorithm has been able to perform its functions as expected by the user.

4. CONCLUSION

Based on the results of the implementation of the push notification promo on the website-based WISCUNONG application that uses the forward chaining algorithm, it can be concluded that the application of the forward chaining method in this application can determine the promo correctly based on the rules that have been made. And the Push notifications that have been created can be used to determine promos on the Curug Winong tourist village ticket booking application based on the specified promo criteria and generate notifications on customer emails.

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