



Halal Tourism Map: A Smart Application for Smart Tourists

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Abstract. A country's economic growth is determined by development in the tourism sector. As a development catalyst, potential in the tourism sector is carried out by developing tourist destinations, one of which is Muslim-friendly based tourist destinations, halal tourism. This research aims to create a virtual reality-based halal tourism map application. This research employed research and development (R&D) method and adapted the ADDIE model for the development stages. This research shows that Exlotours can be a supporting facility for halal tourism marketing and the product is feasible to be implemented as a tool for smart tourism media to promote the industry. Practically, this development is expected to help tourism stakeholders improve halal tourism facilities to increase the number of tourist visits and make it easier for tourists to access information related to halal tourist destinations on Lombok Island. Theoretically, this development contribute to tourism industry, especially smart tourism studies and user technological acceptance.

Keywords: Exlotours, Tourist Destinations, Tourist Maps, Virtual Reality, Halal Tourism.

1. Introduction

The existence of industry in the tourism sector is one of the central parties that contribute to creating national economic development. The arrival of tourists to a destination has many positive impacts that can stimulate the growth of the tourism industry. Based on a Ministry of Tourism and Creative Economy report, data on tourist arrivals to Indonesia has decreased by -0.28% from December 2020 to December 2021. This value is much better compared to the previous year, which ranged from 74.84% in 2020 and 2.03% in 2019 [1]. But it needs to be anticipated again that a decrease in the number of tourists can reduce regional income [2].

The potential of tourism in Indonesia that attracts tourists to visit is halal tourism which has become a world concern and won the award as the best halal tourism in 2015 and creates high demand from foreign tourists from Islamic countries [3]. The government is also

prioritizing tourism development in 10 locations, one of which is Lombok Island [4]. Implementing strategic actions or steps for tourism development by increasing tourism's contribution is necessary. This increase can also be done by strengthening the quality of tourism offered both in terms of management, human resources, and existing promotional strategies [5]–[7]. Problems that tourism managers often face, the most important of which is that tourists find it difficult to find the location they want to go to, especially for newcomers [5], [8]–[10]

Providing access to make it easier for tourists to find the leading halal tourism destination points in Lombok by giving virtual visit facilities to tourist destinations as a reference. A virtual tour is a virtual reality concept that can be used as a medium to introduce and promote a location [2]. The use of virtual reality is more cost-effective and time-saving than conventional methods [11]. Virtual reality can allow users to experience virtual things in real life [12]. Virtual tours provide a positive stimulus in emotional engagement, presence, and enjoyment in tourism and stimulate visitors' intention to travel [13], [14]. Therefore, the virtual reality development strategy becomes a strategic platform in tourism development.

Lombok Island is one of the national halal tourist destinations with the vision of "World's Best Halal Tourism and Cruise Destination" [15]. In developing applications on Lombok Island, providing the best service is a challenge. Many tourists do not know more details about Lombok Island. Therefore it is necessary to develop a strategy for developing halal tourism map applications on Lombok Island so that tourists have insight into the destinations to be visited, besides that the development of this application can increase technological knowledge in the community [16], [17]

This research aims to develop a virtual reality-based halal tourism map application on Lombok Island. It is hoped that it can help relevant stakeholders improve halal tourism facilities to increase tourist visits to Lombok Island. In addition, it is expected to allow tourists access to information on halal tourist destinations on Lombok Island.

2. Method

This research is a research and development (R&D) using the ADDIE development model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation [18]. The initial stage is needs analysis, which analyzes the application's needs before it is developed and identifies potential tourist destinations. Some application needs include hardware and software. According to [18] the hardware requirements for creating a Virtual tour are as follows: 1) IntelR CoreTM i3-4210U processor; 2) Hard Disk with 500 GB capacity; 3) Memory with 2-4 GB capacity; 4) 15-inch LCD and Keyboard and Mouse; 5) Android smartphone equipped with a gyro sensor. The software specifications needed in developing this application are as follows: 1) Windows 10 operating system; 2) Adobe photoshop CS3; 3) Unity 2018.3.12; 4) Google camera; 5) Google cardboard. In addition,

the analysis stage also identified the potential of tourist destinations using qualitative instruments such as interviews, observation, and documentation [19].

The data sources in this study consisted of tourism stakeholders and local communities in Lombok by conducting Focus Group Discussions (FGDs). Furthermore, the data that has been collected will be analyzed using the miles and Huberman data analysis technique with stages 1) compacting data, namely the process of selecting, simplifying, and summarizing data. 2) drawing conclusions 3) drawing and verifying conclusions, namely the process of concluding research results while verifying these results supported by data that has been analyzed [19].

The next stage is developing the Exlotours halal tourism map application through the concept of website-based virtual reality or webapp. The application development used applies the ADDIE model with the following steps:

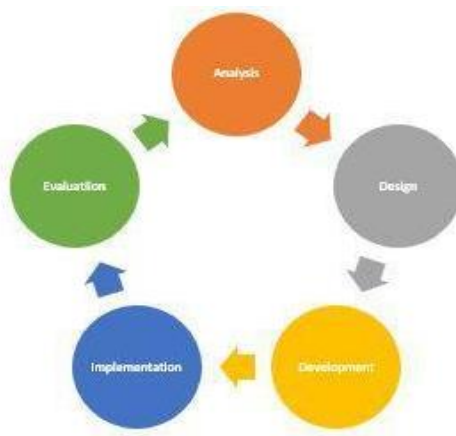


Fig. 1. ADDIE model

The steps at this stage begin with needs analysis or problem identification and initial data collection as needed, then proceed with the desired development design before building a system or product development designed following the research objectives. The next stage after the procedure is developed product development, validation, and product testing to determine whether the product is feasible. Furthermore, the product was revised based on the validation results conducted by expert validators before the prototype product was tested. The next stage is operational evaluation and revision based on previous measuring instruments and functional testing of whether the use of the product is feasible. The eligibility assessment criteria used in the validation process of this application product can be seen in Table 1.

Table 1. Analysis result criteria of the expedience of the instrument points

Percentage (%)	Description
80 – 100	Very Good (No Revision)
66 – 79	Good (Need a few Revision)
56 – 65	Pretty Good (Need Partial Revision)
40 – 55	Not Good (Partial Revision and Reassessment of the Content)
0 – 39	Bad (Overall Revision/Change)

3. Results

3.1 Analysis

The analysis stage is the initial stage before the application is developed. Therefore, this stage is an important part. The reality found that halal tourism on Lombok Island is still poorly known and has several shortcomings, one related to information tourists can access. This is undoubtedly unfortunate because the inclusion of Lombok Island as the top 10 halal tourism destinations in Indonesia means great potential should be utilized. Solutions to overcome these problems must be found, and one of them is by making a website-based halal tourism map application and virtual reality assistance. This is certainly unfortunate because the inclusion of Lombok Island as the top 10 halal tourism destinations in Indonesia means great potential should be utilized. Solutions to overcome these problems must be found by making a website-based halal tourism map application and virtual reality assistance.

3.2 Design

Information ranging from tourist destinations, hotels, restaurants, and mosques is provided in this application. Hopefully, this application can become a supporting facility for halal tourism on the island of Lombok.

Table 2. Exlotours features

No	Category	Features
1	Travel Map/Home	Displays all tourist destinations, hotels, restaurants, and mosques on Lombok Island that provide the concept of halal tourism with a total of 35 places displayed on a digital map with each place indicated by a pointer according to its original location.
2	Tourist Destinations	Featuring tourism destinations on Lombok Island which provide the concept of halal tourism with a total of 20 tourist destinations.
3	Hotel	Featuring hotels on Lombok Island that provide and fulfill the concept of halal tourism with a total of 5 hotels.
4	Restaurant	Featuring Restaurants on Lombok Island that provide and fulfill the concept of halal tourism with a total of 5 restaurants.
5	Mosque	Displays all mosques on Lombok Island that can be used for worship by Muslim tourists with a total of 5 restaurants.

In the Explotours application, there are features that, in this explanation, are distinguished on several pages. First, the main page is the page that users will encounter for the first time. The feature on this page is the display of a tourist map equipped with a pointer according to the actual location of the destination. The lead is clickable and will briefly display information about the selected destination. Moreover, another feature on this page is a search which is used to find tourist destinations, hotels, restaurants and mosques according to the search words entered. There are also applications and menu options for tourist destinations, hotels, restaurants, and mosques. Second, the destination page is a collection of catalog pages from various categories, such as tourist destinations, hotels, restaurants and mosques. In addition, just like the main page, the destination page also displays a tourist map with directions. Still, the difference is that only the selected category will emerge, be it tourist destinations, hotels, restaurants, and mosques. In addition, there are slider options according to the selected type and a brief description of Lombok Island is also included. Third, the destination detail page is a page that displays a number of information related to the selected destination. There are several features displayed, such as: 1) destination location map, 2) destination name, address, contact information, and rating, 3) photo gallery, 4) a glimpse of the destination, 5) WA button that directs to destination-related contacts, 6) Google Map button that directs to the Google Map page, 7) video button that directs to destination-related videos, 8) street view 360 button that displays 360 photos that can be enjoyed in virtual reality, 9) other destination columns.

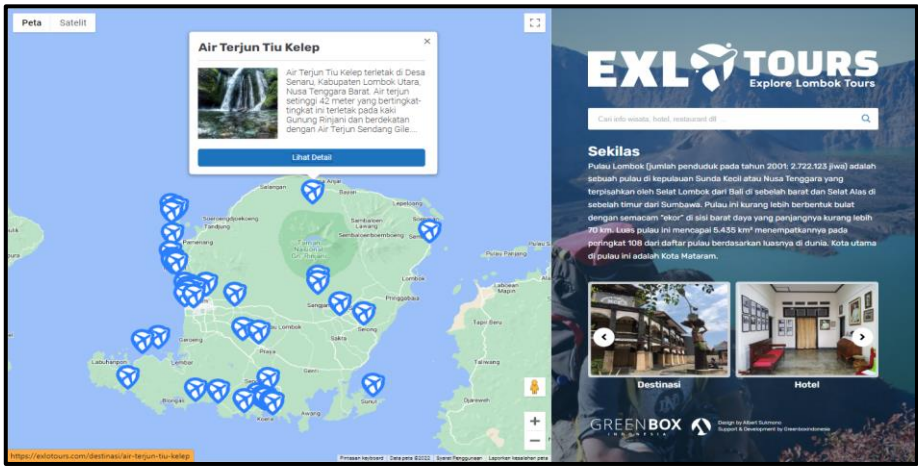


Fig. 2. Main page

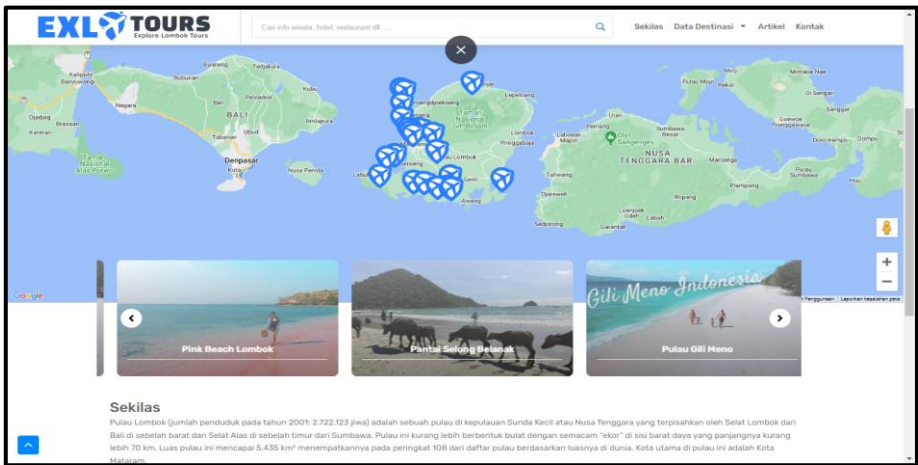


Fig. 3. Destinations page

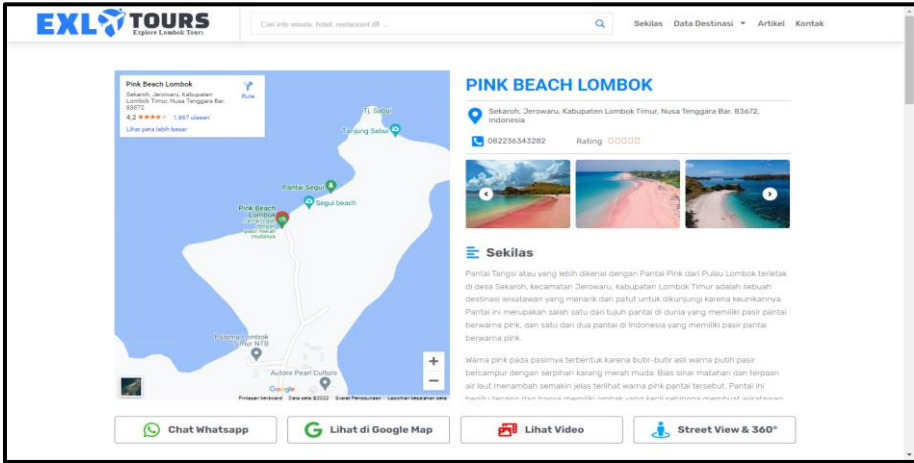


Fig. 4. Destination details page

3.3 Product Development

This development shows that the Exlotours application contains several destination categories, such as tourist destinations, hotels, restaurants, and mosques. On the main page, you can choose which destination category you want to display and search. On the destination page of the tourist destination category, a total of 20 tourist destinations can be found on Lombok Island with various types of tourism, which certainly fulfill the concept of halal tourism. Furthermore, on the hotel category destination page, 5 hotels throughout Lombok Island can be found that provide needs with the idea of halal tourism. On the restaurant category destination page, restaurants can be found throughout Lombok Island, with a total of 5 restaurants that certainly provide halal food and drinks. While on the destination page of the mosque category, information on a total of 10 mosques on Lombok Island can be found, which can be used for Muslim tourists to worship.

3.4 Product Validation

This application development is also equipped with a product validation stage, in which the application product is validated by media experts. Based on several aspects of measuring product feasibility, such as system aspects, user aspects, and interaction aspects included in the instrument, the purpose of this product validation is to assess whether or not the product is feasible to develop. Furthermore, to further produce good product validation results, product validation is also carried out by linguists. Some aspects to be assessed such as, physical size, logo design, the typography of application content, content illustrations, application content layout, and cover typography. The validation results show that the

developed application can be continued at the trial or implementation stage. The rating scale on this product validation instrument uses a Likert scale with a range of 1-4 (1 = Very Bad, 2 = Bad, 3 = Good, 4 = Very Good). The validation results are presented in diagram form and can be seen in Figures 5 and 6.

The results of product validation conducted by media and language experts show that the application product being developed is in the excellent category, with the results of media validation for system operational indicators 93%, system usability 88%, and interactional system 84% at (Figure 5). Meanwhile, the results of language validation are measured based on physical performance indicators 80%, logo design at 87%, cover typography 80%, content illustration 89%, app content layout 76%, and content typography 90% (Figure 6). Based on these results, the developed product is generally in the excellent category.

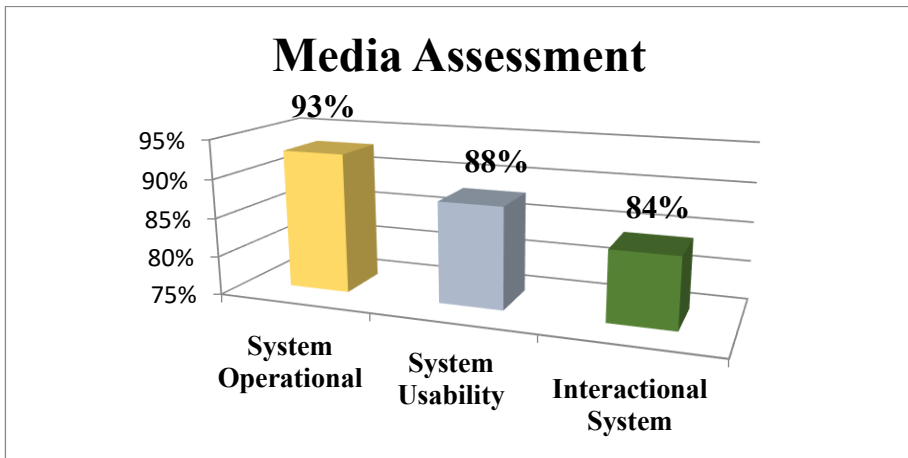


Fig. 5. Media validation

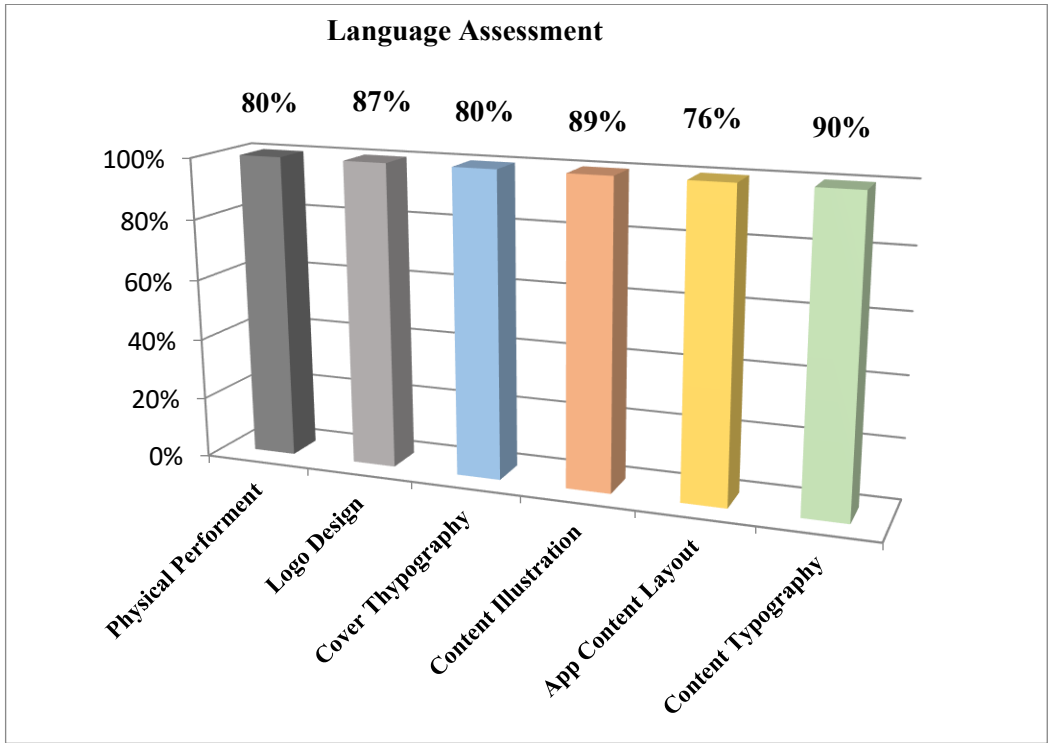


Fig. 6. Language validation

3.5 Implementation and evaluation

The Exotours application was implemented by involving 10 samples as limited field trial respondents. This field trial process relates to using Exlotours application products as halal tourism support facilities on Lombok Island. In addition, the effectiveness and efficiency of the application product were also tested. Respondents in this field trial process were asked to provide scores that would be used as a benchmark for the feasibility of application products. Some aspects that will be assessed in the field trial and the results can be seen in Table 3.

Table 3. Field trial results

Application Component Aspects	Display Organizational Aspects	Content Presentation Aspects	Overall Assessment Aspects
$P = (177/200) \times 100\%$	$P = (145/160) \times 100\%$	$P = (107/120) \times 100\%$	$P = (171/200) \times 100\%$
$P = 0.885 \times 100$	$P = 0.906 \times 100$	$P = 0.892 \times 100$	$P = 0.855 \times 100$
$P = 88.5\%$	$P = 90.6\%$	$P = 89.2\%$	$P = 85.5\%$

The combined results of all aspects of the field trial data can be displayed as follows: $P = (600/680) \times 100\%$; $P = 0,88 \times 100$; $P = 88\%$.

The results show that the Exlotours application is categorized as very good and feasible and can be used as a supporting facility for halal tourism on Lombok Island. Furthermore, the evaluation stage uses criticism and input from experts and from the results of field trials to revise the product until a better product performance is obtained. Some of the suggestions included feature improvements, language improvements, and updates to the population on Lombok Island. Furthermore, the revision process was immediately carried out based on the input that had been obtained previously.

4. Discussion

Tourism development can increase because of the role of information technology and facilities that can meet tourists who want to access information about tourism products anytime and anywhere [21]. Traveling information is undoubtedly necessary, so the development of technology makes Virtual Reality (VR) many users. Virtual Reality (VR) provides all travel information with 3D images or videos so that tourists do not find it challenging to find the intended location. Because the problem of tourists, especially newcomers, is not knowing the travel route [9]. Virtual reality provides an opportunity for tourists to get the experience of traveling to the desired place without having to visit the desired destination with sensory simulations such as sound, sight, and even touch [18], [22].

A virtual tour is the application of technology in tourism today. The virtual tour presents a virtual tourism experience using virtual reality technology [2], [11], [23]. Virtual reality is a technology that allows a person to simulate a real object by using a computer system that can generate a three-dimensional atmosphere so that the observer can physically see it [9], [24]. The use of virtual reality has been widely used in making travel applications that are used as promotional media [25]. This is due to the benefits provided by virtual reality, which can display a simulation of a real object in digital space and move according to the

movements that are made. Based on these benefits, virtual reality can increase the attractiveness and desire of tourists to come to tourist destinations, increasing the number of tourist visits [10], [26], [27].

The use of virtual reality shows the critical role of technology at this time. The current developments, especially technology, continue to affect many sectors, especially the tourism sector, which must also adapt to technological developments. The story of technology, especially in information, has an essential role in tourism. For example, booking airline tickets and hotel reservations are beneficial for tourists in choosing and getting many travel options. In addition, the use of technology in tourism provides facilities for tourism stakeholders to interact directly with tourists [28]–[32]

The use of technology in tourism has taken advantage of several technology platforms, such as websites, social media, and smartphones [33], [34]. The last platform mentioned, smartphones, is the most widely used technology platform. This is due to the increasing use of smartphones in the world, besides that the mobility factor of use and computing experience in a single screen also influences. As a result, smartphones are transforming the tourism industry where tourists access a lot of information at the travel preparation stage using smartphones and the internet [35]–[38].

Tourism is one of the sectors that can increase Indonesia's foreign exchange so the government pays close attention to this. Tourism digital marketing is highly used in promoting tourist destinations [39]. Information technology tools that are interactive and easy to use through mobile devices and are widely used by the public at this time are mobile applications. Mobile applications can bring up creative ideas, one of which is 360o Virtual reality which can display a visual destination as a whole [40]. This innovative idea can be used to promote destinations shown in a virtual tour by providing convenience in the branding process for an object you want to display to tourists [41]

Tourist destinations need good development and recognition. So it is necessary to identify stakeholders who can play a role in developing and introducing tourist destinations [42], [43]. Several tourism stakeholders have already used virtual reality as an exhibition medium for introducing tourist destinations. In a marketing strategy, many positive things can be obtained through virtual reality that can increase visitor presence and be an alternative way to visit real destinations [17]. However, from previous research, there are suggestions for developing this virtual reality application by increasing stakeholder awareness of technology to enhance tourism. In addition, there are also suggestions for the virtual reality application itself, namely that all data that has been stored in the application can be made into a database so that data can be accessed in real-time [44]–[46].

5. Conclusion

The research activity on the virtual reality-based halal tourism map application "Exlotours" yields the result that the "Exlotours" application is very feasible to use as a marketing

strategy and branding a destination. It can be proven based on the results of product validation that has been carried out by media and language experts showing that the application product being developed is in the good category, with media validation results for operational system indicators of 93%, system usability of 88%, and interactional systems of 84%. Meanwhile, the results of language validation were measured based on physical performance indicators of 80%, logo design 87%, cover typography 80%, content illustrations 89%, app content layout 76%, and content typography 90%. Based on these results, the products developed are generally in the excellent category.

The overall research results covering various aspects, including application components, display organizing aspects, content presentation aspects, and general assessment aspects of this field trial give a percentage of 88%. The virtual reality-based halal tourism map application "Exlotours" provides various features that can provide a number of tourism information on the island of Lombok in which there are supporting aspects such as hotels or inns, restaurants or restaurants, and mosques. That way, tourists can receive information quickly.

The development of the virtual reality-based Exlotours halal tourism map application as a supporting facility for halal tourism on Lombok Island is a solution to the deficiencies that still exist in halal tourism on Lombok Island, namely information. Exlotours help tourists, especially Muslims, to access information related to their destination more quickly. Exlotours can also be helpful for halal tourism stakeholders in improving tourism-supporting facilities. It is hoped that with the Exlotours application, the level of tourist visits, especially Muslims to Lombok Island, will increase. Of course, it can be used as a medium of information on halal tourism for visiting tourists.

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