Development Of Augmented Reality Arabic For Islamic Tourism: Sustainable Education Need Analysis

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Abstract
This study explored the need for analysis for development with integrated sustainable tourism education (STE)to enhance Islamic Tourism (IT) experiences in the region. The analysis scope included Tourists' perception of Augmented Reality (AR) usage, business owners' perception of (AR) usage, (AR) Application Content, and (AR) Application Interface and function. The questionnaire, descriptive statistics and purposive sampling procedures were used. The sample size n=20 of Malaysian and Indonesian Muslim tourists participated in the study. The findings supported an (AR) development embedded with (STE) for (IT). They predicted a positive impact of (AR) on (IT)and (STE) industries.
Keywords: Augmented Reality; Islamic Tourism; Need Analysis; Purposive Sampling; Sustainable Tourism Education

INTRODUCTION
Islamic Tourism (IT) is a growing industry that attracts millions of tourists every year, particularly in the Middle East (Mehmetoglu & Normann, 2013). (IT) encompasses a wide range of activities, including visiting Islamic monuments, historical sites, and religious places. Visitors to Islamic sites are often interested in learning about the culture, history, and religion of the place they are visiting. Augmented Reality (AR) can be used with either workbooks or flashcards and many different fields of studies. (Nurkhamimi et al., 2016). The main advantages of (AR) are: learning gains, motivation, interaction, and collaboration. (Bacca et al., 2014). A few studies have been done using mobile device to scaffold personalized learning (Huang, Wu & Chen, 2012). Therefore, the mobile (AR) also can be used for the Arabic teaching and learning purposes with the aid of flashcards. (AR) technology has the potential to enhance the visitor's experience by providing them with interactive (STE) content that enhances their understanding of the place they are visiting. (AR) technology is a type of technology that enhances the real world by overlaying digital information on top of it, creating an immersive and interactive experience for the user (Billinghurst & Kato, 2002). In the context of (IT), (AR) technology can provide visitors with a unique and engaging learning experience that enhances their understanding of Islamic culture, history, and religion.

Several studies have discussed the challenges and opportunities of (IT) in various fields. Mohamed H. Zain and Umi Kalthom Abdul Manaf explained the challenges and opportunities associated with (IT), including the potential of Islamic cultural and historical sites to attract tourists and promote cultural exchange. The study provided insights into the importance of promoting Islamic cultural tourism and preserving Islamic heritage sites. Ahmad Elkhodary emphasized Arabic language for Tourism embed (STE) including Arab world, Arabic language and cultural content. The study provided insights on the importance of incorporating Arabic-language content into the proposed (AR) application to enhance (STE) value.

Different studies investigated the use of (AR) technology in the context of cultural heritage and tourism for different purposes. The study by Buchmann and Eisert, (2012) explored the use of (AR) technology to enhance the visitor's experience at historical sites in Germany. Buchmann and Eisert, (2012) found that (AR) technology provides an immersive and interactive (STE) experiences for tourists as well as enhancing their understanding of historical sites they visit. Likewise, Mihailidis et al., (2014) asserted that (AR) technology provides an interactive learning experience for visitors while exploring different historical sites. Alkhateeb and Toulson (2019) developed an (AR) application that provided visitors to the Alhambra Palace in Spain with an interactive of (STE) experience. The application included virtual objects, animations, and videos that explained the history and significance of the palace. Alkhateeb and Toulson (2019) found that the (AR) application enhances visitors' understanding of the palaces and increases their knowledge of Islamic history and culture. Wenfei, Rahmat, Mohamad Nizar, & Maaruf, (2023) conducted need analysis survey of designing and developing a mobile augmented reality (MAR) application for tourism English learning in higher vocational education in China. Their objective included determining the need to develop a MAR application for tourism management students in higher vocational college (HVC) students n=169. They also interviewed 6 tourism English teachers. The findings revealed that both teachers and students expressed the lack of English proficiency, and the insufficient effect of existing technological teaching tools. They needed MAR technology application for their Tourism English course progress and quality improvement.

Indrastoeti, & Tribudiharto, (2018) analyzed of students' need for (AR) as an art learning medium in primary school teacher education at universitas Sebelas Maret. They surveyed students' need for (AR) in art learning since they wanted to develop prototype (AR) media as a follow up of the need analysis conducted on elementary school teacher education students. The specific aim of their study was to obtain the reliable description of the use of learning media as teaching resource on art learning process, that was existing in the field. The second aim was to formulate a media for their art learning. The descriptive analysis yielded that the use of the existed traditional learning media was not effective. They concluded that there was a need to develop an (AR) for art learning.

A meta-analysis on group design studies was conducted about the (AR) and functional skills acquisition among individuals with special needs by Baragash, Al-Samarraie, Moody, & Zaqout, (2022). The group design studies based on a random-effects model alongside the Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines were used in this study. A sample of n=119 involving individuals with different types of disabilities was used. The overall effect size of AR across the seven studies was significant. The results showed that AR is an effective learning tool for individuals with disabilities.

The student need analysis for the development of (AR) integrated e-modules about particles in Science learning was investigated by Riyanti, Copriady, & Linda, (2022). This research was the analysis phase of the first step in the research on the development of an integrated (AR) e-module. Riyanti et al., (2022) used a survey method, questionnaires, interviews, junior high school students n=32 and Science teachers n=17. The survey results showed 81.3% of students need (AR) in the form of e-modules that could be accessed from their Android so that it helped understand abstract concepts. The teachers were also willing to implement (AR) integrated e-modules reached 100%. In Riyanti et al., (2022) concluded to continue with the rest of ADDIE model to develop an (AR) integrated e-module for particles in Science learning.

A quantitative descriptive study by Kusmawati, & Husen, (2023) was also conducted to investigate (AR) need analysis in human anatomy for sports education students. The major purpose of Kusmawati, & Husen, (2023) was to analyze the need for (AR) in Human Anatomy for Sports Education students using questionnaires, observations and interviews. The results about the existed curriculum showed that 85% of the material was not clear, 80% of the teaching materials were less interesting, 85% had difficulty of understanding language, and 80% lacked clear image. Thus, it was deemed necessary to develop (AR) applications for human anatomy for sports education students.

A teacher's perspective of (AR) need analysis in Science learning was also conducted by Gestiardi, Nurmawati, & Atmojo, (2022). The main purpose of Gestiardi et al,. (2022) was to obtain teachers' views about the acceptance of (AR) material and supporting elements especially in elementary Science learning. The sample of public elementary schools in Surakarta, Central Java, Indonesia teachers n=20 was used. The result showed that (AR) has not been greatly applied in schools; There was a needs to develop various (AR) for Science materials. Such literature justify the necessity to conduct need analysis survey prior to the development of the integrated and (STE) for Malaysia and Indonesia. This research was designed conduct the need analysis tourists' perception on (AR) usage, business owner perception on (AR) usage, (AR) Application Content, and (AR) Application Interface and function.(Al Zaabi et al., 2019)

METHOD

This quantitative survey used a valid and reliable questionnaire which was distributed to number of purposively selected sample of muslim tourists n=20. This study was conducted in Putrajaya and Bukit Tinggi Malaysia as both areas are deemed as the center of Malaysian Muslim tourists. 100% of the distributed questionnaire on the Need Analysis for the development of were returned and analyzed using descriptive statistics. The data was presented in the form of frequency and mean averages.

RESULT AND DISCUSSION
Tourists' Perception On (AR) Usage
Table 1. (AR) Can Empower Tourists To Explore Unfamiliar Areas

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	15%	15%	10%	55%

Table 1 describes respondents' perceptions of the factor: (AR) can empower tourists to explore unfamiliar areas. Most respondents, 55% strongly agree and 10% agree with this statement. While 15% are uncertain whether the (AR) can empower tourists to explore

unfamiliar areas. 15% of respondents disagree and 5% of respondents strongly disagree with this statement.

Table 2. (AR) Can Offer Valuable Information To Improve The Travel Experience

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
0%	15%	15%	15%	55%

Table 2 describes respondents' perceptions on the factor: (AR) can offer valuable information to improve the travel experience. 55% of respondents strongly agree and 10% agree with this statement. Whereas 15% are uncertain about this statement. 15% of respondents state that they disagree and 5% of respondents strongly disagree with this statement.

Table 3. (AR) Can Improve The Excitement Of Tourists When Visiting Interesting Places

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
0%	11%	16%	21%	53%

Table 3 describes respondents' perceptions on the factor: (AR) can improve the excitement of tourists when visiting interesting places. 53% strongly agree and 21% agree with this statement. While 16% are uncertain whether the (AR) can improve the excitement of tourists when visiting interesting places. 11% of respondents disagree. However, due to the rounded percentage, the combined percentage exceeded 100%.(Kalmbach, 2020)

Table 4. (AR) Can Introduce The Concept Of Connectivity And Sharing Experiences Among Tourists

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	10%	15%	20%	50%

Table 4 describes respondents' perceptions of the factor: (AR) can introduce the concept of connectivity and sharing experiences among tourists. 50% of respondents strongly agree and 20% agree with this statement. In contrast, 10% of respondents state that they disagree and 5% of respondents strongly disagree with this statement. Lastly, 15% are uncertain about this statement.

Table 5. (AR) Can Increase The Participation And Involvement Of Tourists During The Visit Session

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	11%	16%	16%	53%

Table 5 describes respondents' perceptions on the factor: (AR) can increase the participation and involvement of tourists during the visit session. 53% strongly agree and 16% agree with this statement. While 16% are uncertain whether (AR) can increase the participation and involvement of tourists during the visit session. 11% of respondents disagree and 5% of respondents strongly disagree with this statement. However, due to the rounded percentage, the combined percentage exceeded 100%.(Mohamed, 2021)

Table 6. (AR) Can Increase The Level Of Acceptance Of New Technologies

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	5%	20%	10%	60%

Table 6 describes respondents' perceptions on the factor: (AR) can increase the level of acceptance of new technologies. Most respondents, 60% strongly agree and 10% agree with this statement. While 20% are uncertain whether (AR) can increase the level of acceptance of new technologies. 5% of respondents disagree and 5% of respondents strongly disagree with this statement.(Mahmoud et al., 2022)

Based on Table 1 until Table 6, the majority of the respondents agree that (AR) can give good impact on the tourist experience such as improving the experience of tourist

involvement during visit sessions and helping the tourist to explore unfamiliar area.(Harb, 2020).

Business Owner Perception On (AR) Usage

Table 7. (AR) Can Help Business Owners By Sending Information In Layers Or On Demand

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
10%	5%	15%	15%	55%

Table 7 describes respondents' perceptions on the factor: (AR) can help business owners by sending information in layers or on demand. 55% of respondents strongly agree and 15% agree with this statement. Whereas 15% are uncertain about this statement. 5% of respondents state that they disagree and 10% of respondents strongly disagree with this statement.

Table 8. (AR) Can Modernize Business Owners' Offers And Promotions, Providing More Engaging And Interactive Content

Strongly Disagree	Disagree	Not Sure	Agree	Strongly agree
5%	0%	20%	25%	50%

Table 8 describes respondents' perceptions on the factor: (AR) can modernize business owners' offers and promotions, providing more engaging and interactive content. 50% of respondents strongly agree and 25% agree with this statement. In contrast, only 5% of respondents strongly disagree with this statement. Lastly, 20% are uncertain about this statement.

Table 9. (AR) Can Increase The Desire Of Customers To Spend More

Strongly disagree	Disagree	Not Sure	Agree	Strongly agree
16%	5%	16%	11%	53%

Table 9 describes respondents' perceptions on the factor: (AR) can increase the desire of customers to spend more. Most respondents, 53% strongly agree and 11% agree with this statement. While 26% are uncertain whether the (AR) can increase the desire of customers to spend more. 5% of respondents disagree and 16% of respondents strongly disagree with this statement. However, due to the rounded percentage, the combined percentage exceeded 100%.

Table 10. (AR) Can Reduce The Dependence On The 'Traveling Season'

Strongly disagree	Disagree	Not Sure	Agree	Strongly agree
5%	10%	15%	25%	45%

Table 10 describes respondents' perceptions on the factor: (AR) can reduce the dependence on the 'traveling season'. 45% of respondents strongly agree and 25% agree with this statement. Whereas 15% are uncertain about this statement. 10% of respondents state that they disagree and 5% of respondents strongly disagree with this statement.

Table 11 (AR) Can Reduce The Burden On Staff During Peak Hours Of Visits

Strongly disagree	Disagree	Not Sure	Agree	Strongly agree
0%	15%	15%	20%	50%

Table 11 describes respondents' perceptions on the factor: (AR) can reduce the burden on staff during peak hours of visits. 50% of respondents strongly agree and 20% agree with this statement. In contrast, only 15% of respondents disagree with this statement. Lastly, 15% are uncertain about this statement.

Table 12. (AR) Can Give The Perception That The Business Owner Is Always Making Improvements To The Place Of Visit

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	10%	15%	25%	45%

Table 12 describes respondents' perceptions on the factor: (AR) can give the perception that the business owner is always making improvements to the place of visit. Most respondents, 45% strongly agree and 25% agree with this statement. While 15% are uncertain whether the (AR) can give the perception that the business owner is always making improvements to the place of visit. 10% of respondents disagree and 5% of respondents strongly disagree with this statement.

Table 13. (AR) Can Help During The Pre-Booking Process

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
0%	10%	15%	35%	40%

Table 13 describes respondents' perceptions on the factor: (AR) can help during the pre-booking process. 40% of respondents strongly agree and 35% agree with this statement. In contrast, only 10% of respondents disagree with this statement. Lastly, 15% are uncertain about this statement.

Table 14. (AR) Can Increase Competitiveness Between Business Owners

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	5%	35%	10%	45%

Table 14 describes respondents' perceptions on the factor: (AR) can increase competitiveness between business owners. Most respondents, 45% strongly agree and 10% agree with this statement. While 35% are uncertain whether (AR) can increase competitiveness between business owners. 5% of respondents disagree and 5% of respondents strongly disagree with this statement. Based on Table 7 to Table 14, the respondents have an impression that the usage of (AR) can give benefits to the business owner in a way that helps reduce the burden of the worker, especially during peak season.

(AR) Application Content

Table 15. The Content Of The Application Should Contain A List Of Activities Offered At The Tourist Destination

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	5%	15%	25%	50%

Table 15 describes respondents' perceptions on the factor: The content of the application should contain a list of activities offered at the tourist destination. Most respondents, 50% strongly agree and 25% agree with this statement. While 15% are uncertain whether the content of the application should contain a list of activities offered at the tourist destination. 5% of respondents disagree and 5% of respondents strongly disagree with this statement.(Hasan Finjan et al., 2021; Maraoui et al., 2021)

Table 16. The Content Of The Application Must Contain The Location Along With A Map Of The Tourist Spot

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	20%	15%	60%

Table 16 describes respondents' perceptions on the factor: The content of the application must contain the location along with a map of the tourist spot. 60% of respondents strongly agree and 15% agree with this statement. Whereas 20% are uncertain about this statement. Only 5% of respondents strongly disagree with this statement.

Table 17. The Content Of The Application Must Display Only Restaurants That Have A Halal Certificate

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	20%	20%	55%

Table 17 describes respondents' perceptions of the factor: The content of the application must display only restaurants that have a halal certificate. 55% strongly agree and 20%

agree with this statement. While 20% are uncertain whether the content of the application must display only restaurants that have a halal certificate. Only 5% of respondents strongly disagree with this statement.

Table 18. The Content Of The Application Must Display Positive Information About The Common Prohibition In Islam

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	15%	30%	50%

Table 18 describes respondents' perceptions on the factor: The content of the application must display positive information about the common prohibition in Islam. 50% of respondents strongly agree and 30% agree with this statement. In contrast, only 5% of respondents state that they strongly disagree with this statement. Lastly, 15% are uncertain about this statement.

Table 19. Application Content Must Use Accurate Terms For Each Visiting Location

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	5%	15%	20%	55%

Table 19 describes respondents' perceptions on the factor: Application content must use accurate terms for each visiting location. Most respondents, 55% strongly agree and 20% agree with this statement. While 15% are uncertain whether application content must use accurate terms for each visiting location. 5% of respondents disagree and 5% of respondents strongly disagree with this statement.

Table 20. The Content Of The Application About The Restaurant Should Display The Price Range Of The Food Served

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	15%	25%	55%

Table 20 describes respondents' perceptions on the factor: The content of the application about the restaurant should display the price range of the food served. 55% of respondents strongly agree and 25% agree with this statement. Whereas 15% are uncertain about this statement. Only 5% of respondents strongly disagree with this statement.

Table 21. The Content Of The Application About The Restaurant Should Display The Time Range Of The Food Preparation Process

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
10%	0%	15%	15%	60%

Table 21 describes respondents' perceptions on the factor: The content of the application about the restaurant should display the time range of the food preparation process. 60% strongly agree and 15% agree with this statement. While 15% are uncertain whether the content of the application about the restaurant should display the time range of the food preparation process. Only 10% of respondents strongly disagree with this statement.

Table 22. The Content Of The Application About The Restaurant Needs To Display The Quality Of The Food Provided

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
10%	0%	15%	15%	65%

Table 22 describes respondents' perceptions on the factor: The content of the application about the restaurant needs to display the quality of the food provided. 65% of respondents strongly agree and 15% agree with this statement. In contrast, only 10% of respondents state that they strongly disagree with this statement. Lastly, 15% are uncertain about this statement.

Table 23. The Content Of The Application About The Restaurant Needs To Display The Location Of The Restaurant

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree

| 5% | 0% | 20% | 25% | 50% |

Table 23 describes respondents' perceptions on the factor: The content of the application about the restaurant needs to display the location of the restaurant. Most respondents, 50% strongly agree and 25% agree with this statement. While 20% are uncertain whether the content of the application about the restaurant needs to display the location of the restaurant. 5% of respondents strongly disagree with this statement.

Table 24. The Content Of The Application About The Restaurant Should Display The Place Where The Food Is Prepared

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	20%	25%	50%

Table 24 describes respondents' perceptions on the factor: The content of the application about the restaurant should display the place where the food is prepared. 50% of respondents strongly agree and 25% agree with this statement. Whereas 20% are uncertain about this statement. Only 5% of respondents strongly disagree with this statement.

Table 25. The Content Of The Application About The Restaurant Should Display The Portion Of The Meal

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
0%	5%	20%	30%	45%

Table 25 describes respondents' perceptions on the factor: The content of the application must display only restaurants that have a halal certificate. 45% strongly agree and 30% agree with this statement. While 20% are uncertain whether the content of the application about the restaurant should display the portion of the meal. Only 5% of respondents disagree with this statement.(Al-Jallad, 2020; Alraddadi & Ghembaza, 2021; Maraoui et al., 2021).

Table 26. The Content Of The Application About The Restaurant Should Display Infrastructure Facilities

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
0%	5%	25%	20%	50%

Table 26 describes respondents' perceptions on the factor: The content of the application about the restaurant should display infrastructure facilities. 50% of respondents strongly agree and 20% agree with this statement. In contrast, only 5% of respondents state that they disagree with this statement. Lastly, 25% are uncertain about this statement.

Table 27. The Content Of The Application About The Mosque Needs To Display The Presence/Availability Of Special Tour Guides In The Mosque

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	15%	30%	50%

Table 27 describes respondents' perceptions on the factor: The content of the application about the mosque needs to display the presence/availability of special tour guides in the mosque. Most respondents, 50% strongly agree and 30% agree with this statement. While 15% are uncertain whether the content of the application about the mosque needs to display the presence/availability of special tour guides in the mosque. 5% of respondents strongly disagree with this statement.

Table 28. The Content Of The Application About The Mosque Needs To Display Information About The Collection In The Gallery Of The Mosque (Cressier et al., 2021; Ritonga et al., 2020)

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	15%	30%	50%

Table 28 describes respondents' perceptions on the factor: The content of the application about the mosque needs to display information about the collection in the gallery of the

mosque. 50% of respondents strongly agree and 30% agree with this statement. Whereas 15% are uncertain about this statement. Only 5% of respondents strongly disagree with this statement.

Table 29. The Content Of The Application About The Mosque Should Display Information About The Availability Of Accommodation Specifically For Tourists

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	15%	30%	50%

Table 29 describes respondents' perceptions on the factor: The content of the application about the mosque should display information about the availability of accommodation specifically for tourists. 50% strongly agree and 30% agree with this statement. While 15% are uncertain whether the content of the application about the mosque should display information about the availability of accommodation specifically for tourists. Only 5% of respondents strongly disagree with this statement.

Table 30. The Content Of The Application About The Mosque Needs To Display Information About Ethics While In The Mosque

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	20%	20%	55%

Table 30 describes respondents' perceptions on the factor: The content of the application about the mosque needs to display information about ethics while in the mosque. 55% of respondents strongly agree and 20% agree with this statement. In contrast, only 5% of respondents state that they strongly disagree with this statement. Lastly, 20% are uncertain about this statement.

Table 31. The Content Of The Application About The Hotel Should Display The Available Facilities

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	10%	25%	60%

Table 31 describes respondents' perceptions on the factor: The content of the application about the hotel should display the available facilities. Most respondents, 60% strongly agree and 25% agree with this statement. While 10% are uncertain about the content of the application about the hotel should display the available facilities. 5% of respondents strongly disagree with this statement.

Table 32. The Content Of The Hotel Application Should Display The Time Of Use Of The Facility For Men And Women

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	5%	10%	20%	60%

Table 32 describes respondents' perceptions on the factor: The content of the hotel application should display the time of use of the facility for men and women. 60% of respondents strongly agree and 20% agree with this statement. Whereas 10% are uncertain about this statement. Only 5% of respondents disagree and 5% strongly disagree with this statement.

Table 33. The Content Of The Application About The Hotel Must Show The Schedule Of Lecture Activities At The Hotel's Prayer Hall

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	15%	15%	65%

Table 33 describes respondents' perceptions on the factor: The content of the application about the hotel must show the schedule of lecture activities at the hotel's prayer hall. 65% strongly agree and 15% agree with this statement. While 15% are uncertain whether the content of the application about the hotel must show the schedule of lecture activities at the hotel's prayer hall. Only 5% of respondents strongly disagree with this statement.

Table 34. The Content Of The Application About The Hotel Needs To Show Ethics When Being In Every Part Of The Hotel

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	15%	15%	65%

Table 34 describes respondents' perceptions on the factor: The content of the application about the hotel needs to show ethics when being in every part of the hotel. 65% of respondents strongly agree and 15% agree with this statement. In contrast, only 5% of respondents state that they strongly disagree with this statement. Lastly, 15% are uncertain about this statement.

Table 35. The Content Of The Hotel Application Must Show The Type And Condition Of The Rooms Available

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	16%	21%	58%

Table 35 describes respondents' perceptions on the factor: The content of the hotel application must show the type and condition of the rooms available. Most respondents, 58% strongly agree and 21% agree with this statement. While 16% are uncertain whether the content of the hotel application must show the type and condition of the rooms available. 5% of respondents strongly disagree with this statement.

Table 36. The Content Of The Application About The Hotel Should Show The Entire Space Of The Hotel

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	10%	25%	60%

Table 36 describes respondents' perceptions on the factor: The content of the application about the hotel should show the entire space of the hotel. 60% of respondents strongly agree and 25% agree with this statement. Whereas 10% are uncertain about this statement. Only 5% of respondents strongly disagree with this statement.

Table 37. The Content Of The Application About The Hotel Should Show Interesting Activities Around The Hotel

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	10%	20%	65%

Table 37 describes respondents' perceptions on the factor: The content of the application about the hotel should show interesting activities around the hotel. 65% strongly agree and 20% agree with this statement. While 10% are uncertain whether the content of the application about the hotel should show interesting activities around the hotel. Only 5% of respondents strongly disagree with this statement.

Based on Table 15 to Table 37, the majority of the respondents agree that the content of the (AR) application must include adequate information on hotels, mosques, and restaurants in order to ensure a seamless experience during the tour session. However, this also posed a challenge to the researcher, as the information needs to be controlled, as too much information will cause tourists to be overwhelmed and lost in the important information.

(AR) Application Interface and Function
Table 38. The Application Interface Should Be User-Friendly

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	10%	20%	65%

Table 38 describes respondents' perceptions on the factor: The application interface should be user-friendly. 65% of respondents strongly agree and 20% agree with this

statement. In contrast, only 5% of respondents state that they strongly disagree with this statement. Lastly, 10% are uncertain about this statement.

Table 39. Interface Navigation Needs To Be Swift

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
10%	0%	10%	35%	45%

Table 39 describes respondents' perceptions on the factor: Interface navigation needs to be swift. Most respondents, 45% strongly agree and 35% agree with this statement. While 10% are uncertain whether interface navigation needs to be swift. 10% of respondents strongly disagree with this statement.

Table 40. The Application Needs To Display The Latest Information

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	10%	25%	60%

Table 40 describes respondents' perceptions on the factor: The application needs to display the latest information. 60% of respondents strongly agree and 25% agree with this statement. Whereas 10% are uncertain about this statement. Only 5% of respondents strongly disagree with this statement.

Table 41. Application Needs To Be Built In Multiple Languages

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	5%	10%	25%	55%

Table 41 describes respondents' perceptions on the factor: (Application need to be built in multiple languages. 55% strongly agree and 25% agree with this statement. While 10% are uncertain whether application need to be built in multiple languages. Only 5% of respondents disagree and 5% respondents strongly disagree with this statement.

Table 42. Application Needs To Be Built With Translation Features (Translating The Sign Into Arabic)

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	20%	25%	50%

Table 42 describes respondents' perceptions on the factor: Application needs to be built with translation features. 50% of respondents strongly agree and 25% agree with this statement. In contrast, only 5% of respondents state that they strongly disagree with this statement. Lastly, 20% are uncertain about this statement.

Table 43. Application Should Be Built With Easy Navigation Features Of Tourist Locations

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	20%	25%	50%

Table 43 describes respondents' perceptions on the factor: Application should be built with easy navigation features of tourist locations. Most respondents, 50% strongly agree and 25% agree with this statement. While 20% are uncertain whether the application should be built with easy navigation features for tourist locations. 5% of respondents strongly disagree with this statement.

Table 44. Application Needs To Be Built With Travel Personalization Functionality

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	15%	30%	50%

Table 44 describes respondents' perceptions on the factor: Application needs to be built with travel personalization functionality. 50% of respondents strongly agree and 30% agree with this statement. Whereas 15% are uncertain about this statement. Only 5% of respondents strongly disagree with this statement.

Table 45. Application Needs To Be Built With The Function Of Scanning Pictures And Other Graphics To Share Additional Information With Users

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree

| 5% | 5% | 15% | 25% | 50% |

Table 45 describes respondents' perceptions on the factor: Application needs to be built with the function of scanning pictures and other graphics to share additional information with users. 50% strongly agree and 25% agree with this statement. While 15% are uncertain whether the application needs to be built with the function of scanning pictures and other graphics to share additional information with users. Only 5% of respondents disagree and 5% of respondents strongly disagree with this statement.

Table 46. Application Should Be Built With The Function Of Adding, Modifying And Deleting Tourist Opinions For Each Place Of Visit

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
10%	0%	15%	20%	55%

Table 46 describes respondents' perceptions on the factor: Application should be built with the function of adding, modifying, and deleting tourist opinions for each place of visit. 55% of respondents strongly agree and 20% agree with this statement. In contrast, only 10% of respondents state that they strongly disagree with this statement. Lastly, 15% are uncertain about this statement.

Table 47. Application Needs To Be Built With Scene Display Functions Related To Information

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	21%	26%	47%

Table 47 describes respondents' perceptions on the factor: Application needs to be built with scene display functions related to information. 47% of respondents strongly agree and 26% agree with this statement. Whereas 21% are uncertain about this statement. Only 5% of respondents strongly disagree with this statement. However, due to the rounded percentage, the combined percentage does not reach 100%.

Table 48. The Application Should Be Built With The Function Of Playing The Audio And Video As Supporting Material Describing The Information

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	0%	15%	30%	50%

Table 48 describes respondents' perceptions on the factor: The application should be built with the function of playing the audio and video as supporting material describing the information. 50% strongly agree and 30% agree with this statement. While 15% are uncertain whether the application should be built with the function of playing the audio and video as supporting material describing the information. Only 5% of respondents strongly disagree with this statement.

Table 49. (AR) Can Provide Information On Demand And Reduce The Effects Of Information Overload And Irrelevant Information (ÖZ & GÜR, 2023)

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
5%	10%	20%	20%	45%

Table 49 describes respondents' perceptions on the factor: Application should be built with the function of adding, modifying, and deleting tourist opinions for each place of visit. 45% of respondents strongly agree and 20% agree with this statement. In contrast, only 10% of respondents state that they disagree and 5% of the respondents strongly disagree with this statement. Lastly, 20% are uncertain about this statement.

Based on Table 38 until Table 49, the respondents perceive that tourists need an interactive user interface and well-developed functions. It is important to ensure all the user interface and the application functions working well, as a half-baked application will discourage the user from using the (AR) application due to the bad experience encountered.

CONCLUSION

This study was conducted to explore the need analysis for development with integrated sustainable tourism education (STE) to enhance Islamic tourism (IT) experiences in Malaysia. The analysis scope included: Tourists' perception on (AR) usage, Business owner perception on (AR) usage, (AR) Application Content, and (AR) Application Interface and function. This survey used a valid and reliable questionnaire which was distributed to number of purposively selected sample of tourists *n*=20. The data collection was conducted in Putrajaya and Bukit Tinggi Malaysia as both areas are deemed as the center Muslim tourists. 100% of the distributed questionnaire on the Need Analysis for the development of were returned and analyzed using descriptive statistics. The data was presented in the form of frequency and mean averages. The analysis yielded the strong support for (AR) development for (IT) and (STE) developments. The findings predicted a positive impact of (AR) on (IT) and (STE) industries. The data presented throughout these (1-49) revealed reveal a strong support among respondents for various aspects of (AR) usage in tourism along with all the respective analysis scopes.

The respondents believe that (AR) enhances tourists' exploration in unfamiliar areas, improves the travel experience, fosters connectivity and sharing among tourists, increases acceptance of new technologies, and aids business owners by providing layered information, boosting customer spending, and fostering competitiveness. The data also revealed that the respondents stress the importance of embedding the comprehensive (STE) content in (AR) applications, including details on activities, restaurant certification, Islamic considerations, and various destination features. Further findings showed a consensus that the (AR) application interface should be user-friendly, multilingual, and offer personalized Arabic translation features, while minimizing information overload. Thus, the findings supported an (AR) development embedded with (STE) for (IT). The findings also predicted a positive impact of (AR) on (IT) and (STE) industries.

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