

Mobile application for Cultural tourism in Oman using Augmented Reality

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ABSTRACT

The recent advances in smartphones and mobile applications have increased the popularity of augmented reality applications. This technology has demonstrated great benefits when applied to the field of manufacturing, medicines and education. The aim of this project is to apply Augmented Reality in a mobile application in order to promote the tourism in Oman. By using such application, the tourist can acquire easily and promptly the history and other details on the different archeologic sites, museums and popular sites in Oman. The application is location based augmented reality and relies on GPS in order to identify the user's location and the list of sites available in that geographic area. The design covers different aspects of the application such as use case diagrams, sequence diagrams, ERD and flowcharts. The implementation is done using Android Studio. Finally, as tourism plays, currently, a prominent role in supplementing the Sultanate budget, this mobile application will participate in enhancing the national economy and in modernizing the tourism sector.

Keywords:

Augmented Reality, GPS, mobile application, Tourism, smartphones

Introduction:

The Sultanate of Oman has a rich culture and tourism Very beautiful nature that brings together all terrain from a mountain, plain and sea. The Sultanate of Oman consists of 11 governorates of a diverse nature and culture, including traditional markets, beautiful beaches and castles, which speak of a long history that the Sultanate has been in since ancient times, and the Sultanate of Oman is rich in many traditional meals that taste great. Muscat is the capital of the Sultanate of Oman and contains many tourist destinations, including beaches, traditional markets, historical castles, various museums, mosques, the opera house, and others. But it is unfortunate that there are not many tourists, whether from Oman or abroad, who do not know anything about these tourist sites. Perhaps these is due to the lack of information that speaks and highlights these sites in the correct, interesting and attractive manner, and give each place the right to show its beauty and picturesque nature. Recently, the government has begun to take an interest in the tourism sector through the establishment of the Ministry of Tourism, which is concerned with developing tourism and attracting Omani and foreign tourists by promoting in the media and social media.

From this standpoint, we wanted to participate in spreading tourism in the Sultanate from the inside or outside by building a tourist mobile application that works on virtual reality and helps to transfer information about tourism in the Sultanate of Oman. in the last period

Mobile phones have become a necessity for everyone. Both to communicate and share information.

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The use of augmented reality technology is an application to visualize and simulate tourist sites with mentioning information that tells the story of the tourist site before the tourist arrives at it.

The use of mobile applications enhanced with virtual reality for tourism information may increase the spread of tourism in the Sultanate of Oman domestically and identify foreign tourists visiting the Sultanate of Oman. This application can also increase the interest of local and foreign tourists for tourism in the Sultanate. The augmented reality can also make users interact directly with the application's user interface. Also, users can view and enter tourism sites in the Sultanate. In this research, the creation of an android application using augmented reality aims to assist citizens, residents and foreign tourists in choosing tourism sites in the Sultanate by interacting with the place.

Among the references that contributed to the development of plans and ideas for creating the application:

1. Mobile application development: JavaScript frameworks (eBook):

This book is all about JavaScript and they are web developers looking to develop mobile applications using JavaScript technologies. This book explains how to create a fast, high-quality mobile app. It also talks about the things that you will use such as: developing, building and operating across different smart phone systems.

2. Characterization of the smartphone and tablet application life cycle (application) via the Apple App Store classification:

Today, it has become a rapid growth and widespread use of comprehensive mobile applications, which indicates the importance of these applications in our life. This box talks about the experience of applying product life theory to mobile applications (PLC), which helps us in managing the application and knowing the levels and sales of the application.

3. How augmented reality (AR) is revolutionizing the travel industry

AR is a technology that changes people's perception of the physical environment, when viewed through a camera, it is closer to reality. But it is not a substitute for the real world environment, but the user is interested in the composite digital image. Pokemon Go. We can use it in tourism by using it so that the tourist sites are shown through the phone's camera.

Methodology:

We used a dynamic system development method (DSDM):

It is a dynamic expansion step of the system and product development method for thinking and visualizing data about risks that could be the critical outcome of developing an indicator.

The stages that the DSDM model goes through:

First: The action plan: it differs from the need to work and collect important data and reports for study and confirmation.

Second: The formation and design stage: Here it is necessary to make sure that the models are identical, and the design of the model must be verified whether it is correct or not. Finally, it is necessary to take and select the appropriate segments for the production.

Third: Implants: This is the last stage. Procedures are followed in terms of submitting a sample of the product. The product is put into use and checked by the user or customer.

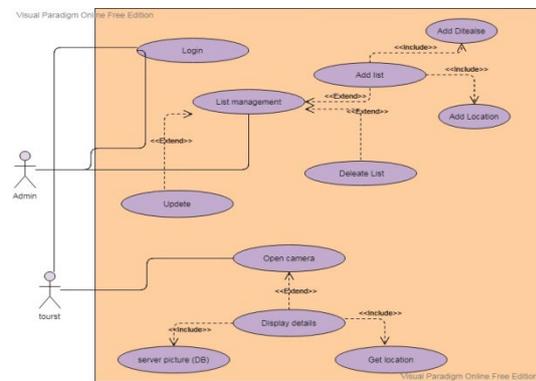
Use Case Diagram

The goal of the master plan is to use it to summarize the activities that the supervisor and the user will use in the application and when the user enters the program, the following matters will be settled:

First of all, the user registers in the application if he has an account and then he can log in or register a new account. Second thing is that he chooses to turn on the phone's camera, so he determines his location, and then the photo and details of the tourist sites near it are shown.

An administrator can perform the following actions in the application, such as:

Sign in first as admin, upload, delete, add photo and annotation.



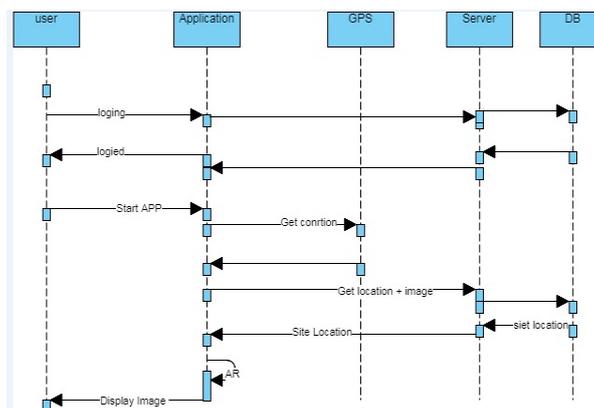
Use Case Diagram

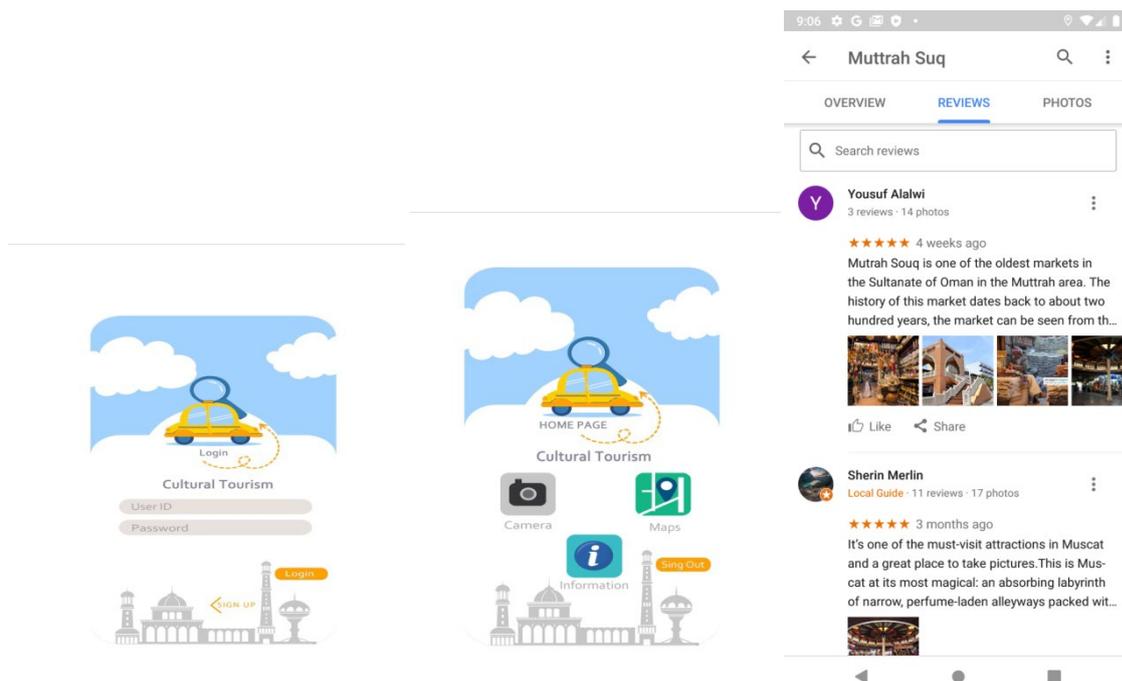
Sequence diagram

A serial diagram describes the interaction between the system and the user, and in the diagram, a single user and database

Posts describe user actions and additions in the database:

The user logs into the program and then turns on the camera that determines his location via GPS, after which it sends the location to compare it with the data in the database, if it exists, the image appears to the user with some information related to the tourist site.



Application Screenshots:**Conclusion:**

Upon completion of the construction of this application, the application is expected to be used for the entire community and international local tourists as it provides a new way to obtain information related to tourism in the Sultanate of Oman. It will also help promote tourism destinations in the Sultanate so that tourists may be interested in them coming to the specified location. Finally, this application is characterized by interacting with users and collecting data for the sites they visit and using it in developing and building the application base and knowledge interaction.

References:

1. Anett Mehler-Bicher and Lothar Steiger (2014) *Augmented Reality: Theorie und Praxis*. Berlin: De Gruyter Oldenbourg. Available at: <https://search.ebscohost.com/login.aspx?direct=true&site=eds-live&db=e000xww&AN=809469> (Accessed: 20 November 2020).
2. Vijay, V. C., Lees, M. and Vakaj, E. (2020) 'Introducing knowledge based augmented reality environment in engineering learning - a comparative study', 2020 IEEE Learning With MOOCS (LWMOOCS), Learning with MOOCS (LWMOOCS), 2020 IEEE, pp. 131–143. doi: 10.1109/LWMOOCS50143.2020.9234329.
3. Feighery, W. (2012) 'Tourism and self-Orientalism in Oman: a critical discourse analysis', *Critical Discourse Studies*, 9(3), pp. 269–284. doi: 10.1080/17405904.2012.688210.
4. Mobile Application Development: JavaScript Frameworks (e-book):

Saleh, H. et al. (2016) *Mobile Application Development: JavaScript Frameworks*. Birmingham, UK: Packt Publishing (Learning Path). Available at:

<https://search.ebscohost.com/login.aspx?direct=true&site=eds-live&db=e000xww&AN=1364681> (Accessed: 11 December 2020).

5. Smartphone and Tablet Application (App) Life Cycle Characterization via Apple App Store Rank:

Jia, H., Guo, C. and Liu, X. (2020) ‘Smartphone and Tablet Application (App) Life Cycle Characterization via Apple App Store Rank’, *Data & Information Management*, 4(1), pp. 44–67. doi: 10.2478/dim-2020-0002.

6. IMPORTANCE OF MOBILE APP DEVELOPMENT

In-text: (Importance Of Mobile App Development, 2020)

Your Bibliography: Omsoftware. 2020. Importance Of Mobile App Development. [online] Available at: <<https://www.omsoftware.net/technology-blog/importance-of-mobile-app-development/>> [Accessed 11 December 2020].