Indus Explorer: An Android Based Tourist Guide Application

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Abstract: Multimedia based tourist information applications are gaining much popularity with the increased usage of electronic gadgets such as mobile phones, tables and global positioning systems. In this research project multimedia tools have been used to develop an android based digital tour guide app for Sindh Province which will be used by tentative tourists from around the globe. For the ease of the tentative travelers, the digital tour guide app is available and named as followed on the google play store "Indus Explorer". The purpose of this application is to introduce a digital and handy view of the archaeological, historical, recreational places for the interest of tourists, people, and the cultural aspects of Sindh one of the four provinces of Pakistan has great piece in the history of earliest and organized settlements. Sindh is also known as the great Indus civilization, which dates back as far as 1300 BCE. As the scientific researchers suggest, it is one of the oldest civilization in the world. The Android platform is the most popular operating system that is being used in the world, and keeping that in mind this extremely user-friendly platform have been used to develop this application, the system would hopefully provide Sindh, Pakistan with exposure at international and digital level, as it was observed that similar tourist applications are available but this systems to serves this particular purpose of highlighting the historical cultural heritage of Sindh.

Keywords: Sindh, Digital tourism, android and Sindh, Indus explorer

I. INTRODUCTION

An Android based Sindh tourist guide named "Indus Explorer" is an application that is developed to give exposure to the archaeological and historical entities that have a significant history and are tourist attraction points. The research provides a range of sites that are sought by travel lovers who wish to explore the heritage and culture of Sindh, Pakistan the land that is steeped in history. Millions of years of history and the combination of sea, desert, mountain ranges, the beautiful Indus River and vast fertile fields [1]. The application is available to be downloaded free of cost, all over the world.

The facts and data gathering process included Searching of places that had historical importance and were the part of the cultural heritage, the time span to cover the 29 districts of the province that has the area of 140,914 km2 was 7 months, the tourist attractions were spotted and then captured, their history was collected, facts and fiction was separated.

After all the research and data collection, The information and data was collected first hand and managed manually by visiting all the major attractions and archeological sites.

Sindh is a land where history lingers, and time wishes to rest its tired feet. The history of this ancient land has been written and rewritten, leaving visible traces to be admired everywhere. It is the land which attracts people from all over the world: the lakes of this land are hosts to millions of migratory birds that fly across many countries and rest here. Its coast line has forests of mangroves [2] and the natural

and busy sea port of Karachi. The Arabian Sea provides wonderful opportunities for water sports and its sun-kissed beaches invite you with open arms throughout the year.

In this age of technology smart devices have conquered all of us, People are used to android smartphones for the basic needs of our technology age, like calling friends, capturing photos, social networking and locating places using a Google map [3]. Therefore, Android operating system was chosen. Its ease of use and user-friendly interface is easy to use. This android application for travelers to get in touch with places that have been so far, hidden in the heart of the Indus valley (Sindh). The system is coded in J2ME (Java Platform, Micro Edition) this version of Java is mainly used to develop applications running on mobiles, embedded systems and small devices [11]. This application happens to be unique in sense of design of the interface the menu of the application is the map of Sindh that has been made with custom made embedded buttons so user would have a unique user experience selecting a city no searching required inside the application. This would probably increase potential tourism and boost economy by providing locals opportunity to earn a living from the people who come to visit certain tourist attractions this all was done to help the economy and bring up the positive picture of my country, as majority of the people living in rural areas live below the poverty line and with the increase in tourism in their neighborhoods could help them earn a living which will automatically help the economy [4]. With changing times, the mobile technology has changed a progressively in the last few years. In fact the handset industry has turned from simple budget handsets, to ultra – modern high-end

mobile phones and testing systems on these smartphones has now been a hurdle [12].

Tourists, or we can say, people who love to travel or people who visit places for any work- related purposes, in fact everyone is used to using an android Smartphone. This application now available for Sindh is packed with a beautiful guideline to visit historic sites that are a part of the sindhi heritage. So the visitors are left on the mercy of guide books and paper maps and it also gets difficult for new travelers to obtain these things, and it is also a time and money-consuming activity. And then comes the effort of reaching these places, which is the most challenging task, as the books or maps just provides the information. Keeping in view the current scenario of Sindh, where precisely no application for Sindh as the one stated above, has been present to aid locals and internationals in this endeavor. This data is available in hard copy and needs to be purchased, which is time consuming, such as finding the book store and the correct book [5]. It is difficult to find the data for each of the district as there are twenty-nine districts.

A. Aim

The system aims to contribute information and visual images with routes to certain places that have historical value and could be potential tourist attractions. Providing routing involves the integration of maps offered as API by google and the sites are pin pointed by using their longitudinal and latitudinal coordinates and hence will achieve the characteristics of Location Based Service application.

B. Objectives

- To make Sindh digitally available in the palm of one's hand.
- To facilitate tourists, history lovers and archeological experts in their exploration.
- To locate these interesting places of Sindh, and, describe how to reach them.
- To facilitate people to easily schedule a visit by having information of which places to visit already.
- To make photos and information of historical sites accessible to tourists throughout the globe.

II. SIMILAR WORK

Applications that are similar to indus explorer one of them is called world travel by Triposo it provides recommendation for travel destinations through searching multiple websites and providing optimum personalized results [7] as shown in Figure 1.
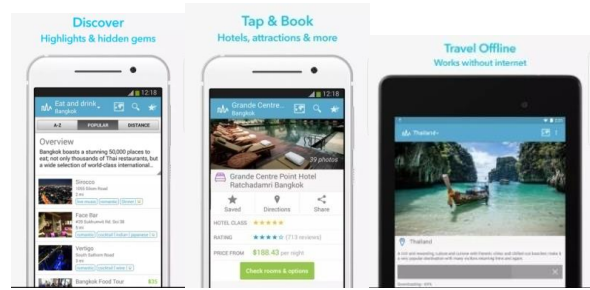

Figure 1: World travel guide by Triposo [7]

The world travel guide by tripposo contains system that drive data from other websites and provides with results on the other hand the Indus explorer is completely packed with static data.

This tripposo app provides a wide range of options to users like picking their favorite hotel book restaurants. Whereas the Indus explorer just provides the information and routing to certain places.

Furthermore, another application named as The Egypt travel guide contains complete and up to date city guides for Sharm el-Sheikh, Hurghada, Cairo, Luxor and many other travel destinations in Egypt. It works offline, you do not need an internet connection but it is limited to the predefined cities which makes it useless if you wander in any other city of Egypt and in that context the Indus explorer covers more than 29 districts and approximately 100 plus tourist attraction points [8].

Figure II: Egypt travel guide [8]

Another Similar system that was reviewed. It has been developed using the google earth application to create a virtual tour for Las Quilamas Natural Park, located in the Spanish Central System, the system uses geological layers, digital terrain and topographic models that can be structured in a 3D model [9]. The Google Earth application was used to import the geo site place marks were imported from the google earth application. A tab has been developed for each geo site, which presents description of the geology with diagrams and photographs.

These are used to evaluate the tourism, scientific, and educational quality. The application using google earth shows a 3d model of a terrain as shown in figure 3:
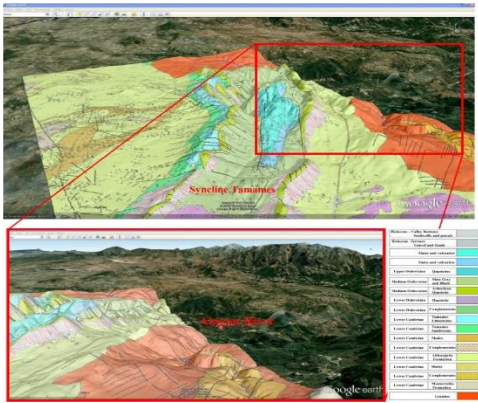

Figure 3: A virtual tour of geological heritage [9]

Some other similar reviewed work includes The Guide project. It was about the city of Lancaster, UK [13]. Series of wireless access points were used to locate a user and information was collected for any tourist interest point, it used a browser-based interface to derive information. The Nokia research center developed a The TellMaris prototype [6]. The combination of 3D graphics with 2DMaps to create user experience was used and it was one of the first mobile systems that provided this. It was developed for the tourist using boats travelling the sea the prototype for laptops had the name tellmaris on board and the application for handsets was named tellmarisguide.

Conclusion obtained by the review of similar works and literature is all the reviewed systems provide some kind of networked or offline tourism assistance to users but still research is needed in this area. The Indus explorer addresses some of the short comings

- Provide information, images, map view offline.
- No data download of maps occur, user automatically redirected to google maps app.
- Google map's get directions function integrated that provides direction for certain places dynamically.
- Friendly user interface.
- Dedicated designed menu (map of Sindh, Pakistan) for user assistance.
- All information of tourist attractions provided in the application file no additional data downloads take place.

III. ANALYSIS AND DESIGN

A. USE-CASE Diagram

To use ANDROID BASED SINDH TOURIST GUIDE, the user has to open the application, and after opening the application the splash screen comes up and the loading bar rolls. Then the user will use the menu that is the map of Sindh and, he/she can choose any of the districts that are listed. Users can easily get information about any place that is available in the chosen district they have selected. The users will be benefited by this application as it provides the vast majority of the attractive sites that are currently hidden from the world. As shown in the figure 5.
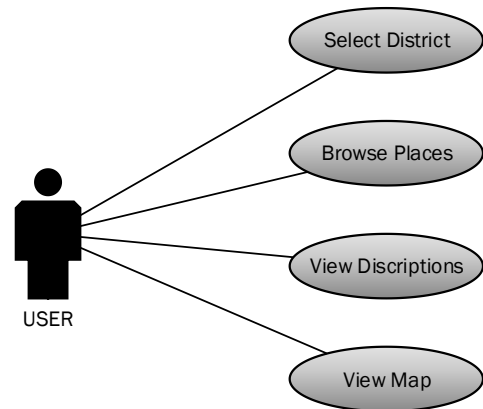

Figure 5: Use Case Diagram

B. Activity diagram

To perform the activities, the user will open the application and will select the desired district. After selecting a district the user can choose any area for which the user wants to get information and directions. The activity diagram is shown in the figure 6.
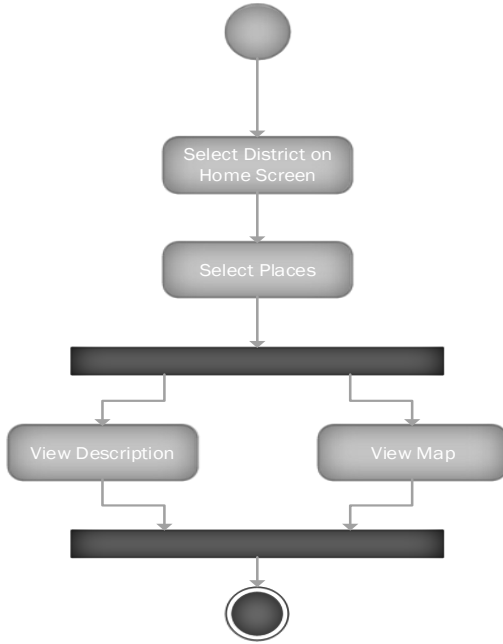
Figure 6: Activity diagram

IV.   IMPLEMENTATION

The implementation of findings and research in developing the application was done using Java as the programming language, and the user interface and aesthetics was made in android. Although the implementation is the fruition of a chain of efforts, starting with analysis, it is the most demanding stage in the moveable web development. In fact, if the detailed design has been done properly, thought and creativity are needed less than is persistence, accuracy, and attention to detail.

During the implementation stage of the system, we inverted the detailed design into code in the programming language. The major product of the implementation stage, the 'source code', is the ultimate goal of the application development process. There is a real sense of accomplishment when the application reaches its deliverable form. An executable code seems much more real and exciting than the specifications designed. We have uploaded the application for the purpose of testing on Play Store

A.   The User Interface Design

The application was developed using Android Studio with Java as backend language. The welcome screen and emulator output of the initial welcome screen is shown in figure 7.
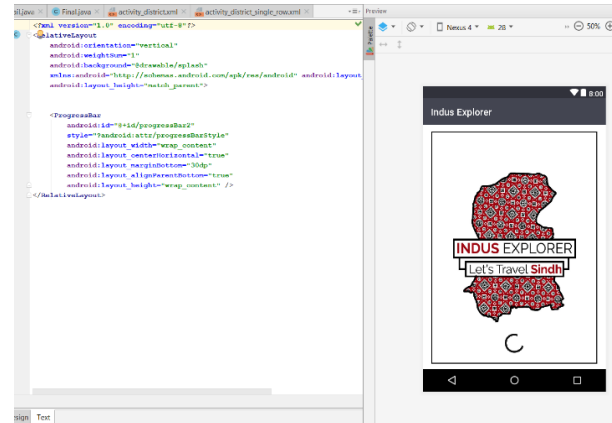

Figure 7: XML code of Welcome screen

The main menu of the app uses a unique button structure embedded on the map of Sindh province. For each district of Sindh, there is a button which will allow the user to explore that district. There are a total of twenty-three district based embedded buttons on the map as shown in figure 8.
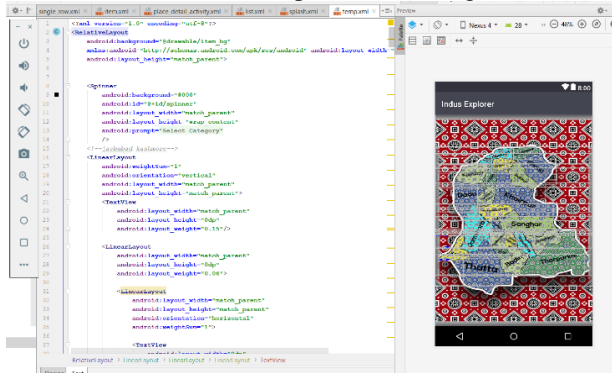

Figure 8. Embedded buttons of each district on Map of Sindh province.

The details of each individual location are then shown with images, a google map and historic data about that location. The user can browse the images and then get directions using the integrated google map of that location as shown in figure 9.
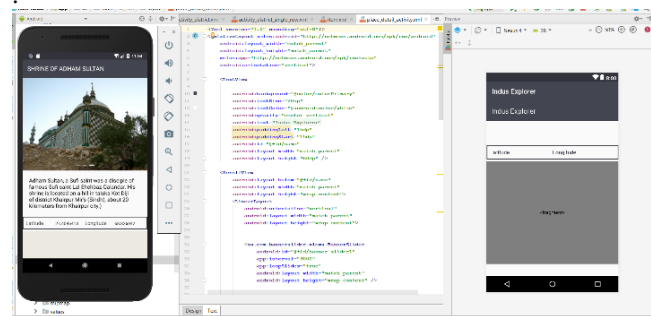
.

Figure 9: Individual location details

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B. Integration with Google API

The system design of Indus explorer acts as a guiding application and routes providing technology, can be said a location based service. The location based services use the technology for positioning, that is the most widely recognized system Global Positioning System (GPS), and the global positioning system technology has transformed Traveling [10]. The android studio has the google Maps SDK (software development kit) for Android operating system, Maps SDK for Android includes built-in support for accessibility. The google maps API when integrated in the code the API automatically handles access to Google Maps servers, map display, data downloading and response to map gestures by its built in functions, the API key is included in the androidmenifestfile.xml as a permission. The API key is a product of google. The "onMapReadycall" and "onMapReady" functions were used and latitude and longitude values are passed to provide user with map of a certain place as shows in the figure 4 (a).
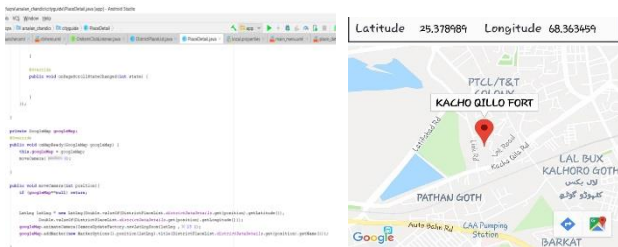

Figure 4(a): the code in java for a certain location

Google get direction function redirects user to the google maps application and provide user with the dynamic directions turn by turn as the user moves as shown in figure 4(b).
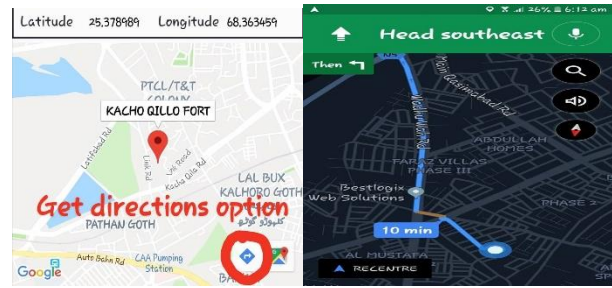

Figure 4(b): get directions option redirects to google app and it directs the user towards its destination

V. RESULTS

The following results have been achieved after the implementations:

A. Application icon

The figure 10 shows the icon of the project which will be available on the android home screen after the application is installed.
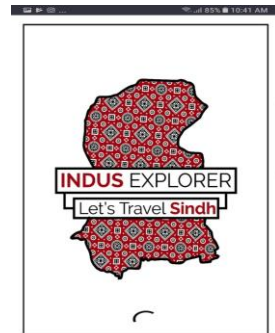

Figure 10: Application Icon   Figure 11: Splash Screen

B. Application Splash Screen

The figure 11 shows the Splash screen activity of the application it contains image viewer.

C. Application Home Screen

Figure 12 shows the home screen of the application. The user can select the district, by clicking. Each district of Sindh is embedded as a button on the map. Hence the map itself becomes the selectable menu where the user is able to click on each district to view locations and its attractions.

Figure 12: Home Screen

D. District Places Screen

The figure 13 shows the tourist places screen which comes after the user has selected a district.

Figure 13: Places Screen

E. Description and Map view of places

The figure 14 shows the screen where user can read the description of any particular place and the map of the location is available. It is an integration of google maps, the locations are pointed out because at the back end the longitudes and latitudes are stored in the application.
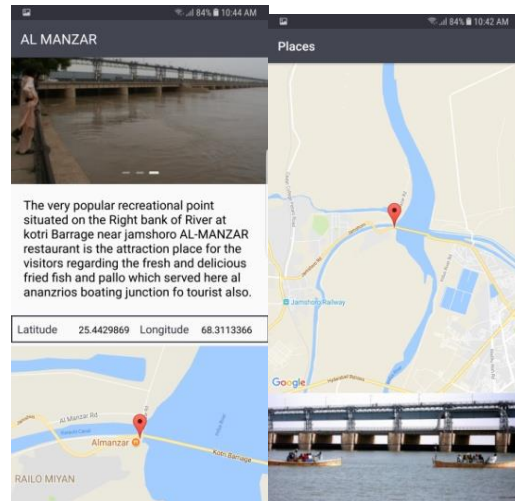

Figure 14: Description and Map Screen.

VI. CONCLUSION

This android mobile application is designed to help the tourists of Sindh and people from all over the world. The research work presents all the details that this application entails. The application designed as a helping tool for the travelers and history lovers to get in touch with the local culture and heritage. Keeping in view the current scenario this is an electronic tourism facility for Sindh and very limited works are present that provide aid to locals and internationals. The effort to reach these places, which is the most challenging task, as any tour book would just provide the information not the routes.

It has been observed that the android application after being available to the general masses has been successfully playing its part in the society.

Android Based Sindh Tourist Guide (Indus Explorer) excluded the hurdles of purchasing books and searching stuff and provides ease for visitors, tourists and people from of all over the world by providing images, information and routes to the place. However, it is a good initiative towards the betterment of the opportunity to explore the beauty of Sindh, Pakistan.

The beautiful historical tourist attractions of every city are in the users hand and under some specially designed buttons that are embedded in the map of Sindh, and with just a few clicks would find what the user needs.

A. limitations

There are certain features and capabilities which this application is not currently providing, the main limitations are:

- The Map is not working offline

- User feedback option is not provided
- There is no panel for admins
- User can not add new places and their information.

B. Future Work

The future work that has been left until the acquirement of resources. With the additions stated bellow the application could get even better in the future. As the computing power of mobile processors increases it is going to enable us to do many other additives.

- An Admin panel can be added in the application
- User ratings and suggestion will be added for better feedback
- The detail contact information can be added for each tourist site and can provide paid tour arrangements through the application

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