

# A Point-Of-Interest Directory For Mobile Tourists In Abuja, Nigeria

**Afolalu C. A.**

Department of Computer Science  
Afe Babalola University, Ado-Ekiti  
Ekiti State, Nigeria  
catherinea@abuad.edu.ng

**Olatunji K.A.**

Department of Computer Sci.  
Afe Babalola University Ado  
Ekiti State, Nigeria  
odekunlekenney@yahoo.com

**Nwagbo C.C.**

Department of computer Sci.  
Afe Babalola University Ado  
Ekiti State, Nigeria

**Abstract—Tourism is one of the largest industries in the world because majority of the public have to travel at one point in their lives whether for pleasure, vacation, business or official assignments. This holiday experience has therefore turn into tourism business thereby creating room for unlimited resources in the tourism sector. This experience has taken further and developed every single day to help tourist fit into a comfortable life outside their respective homes. Unfortunately, with the increasing growth of wireless technology and mobile devices in this era has brought about significant changes to people's lives there are still some issues regarding tourism sector that has not changed over the years as most tourists still rely on the traditional tourist maps and guidebooks for direction and place-of-interest. With the advent of Mobile wireless technologies, A Mobile tourism guide will represents a relatively new trend in the field of tourism and involves the use of mobile devices as electronic tourist guides. Therefore, this paper proposed a prototype of mobile tourist directory for Abuja city in Nigeria to improve the travel experience of tourists. The mobile tourist directory provides a user-friendly interface for end users for easy access and understanding which will successfully overcome the drawbacks of the existing system as the mode operation of the proposed system is both online and off-line modes.**

**Keywords—Tourist, mobile directory, mobile devices, Abuja city,**

## I. INTRODUCTION

Mobile based tourist directory is an application that involves using a mobile device as electronic tourist guide. It allows the tourist to search information about a Point of Interest (POI) from a mobile device[2]. The advancement and constant evolution of technology has brought about significant changes in how humans react to their immediate environments as a result of developments and findings in the science to make life easier and better for the present generation and the next. The development of Internet has generated strong impacts in many areas of life. The Internet has changed the way we do business, the way we communicate and also, it has given an international

dimension to the world. Internet has become the universal source of information for millions of people, at home, school, and work. The Internet with its multiple communication channels also changes the world of business, the marketing principles and generates a new way of commerce. Nowadays, people rely on the web for their everyday life, requesting information to be available anywhere, anytime and accessible from all the devices [3]. The next phase of development of the Internet appears to be focused on mobile devices where the challenge is to make information accessible to them in forms that the users can exploit effectively [9]. Mobile technology is a field in rapid development. Especially over the past few years, the improvements in mobile technology have been tremendous. The increase in performance of these devices, as well as the additional hardware in form of GPS, sensors, etc., make them powerful devices which can develop comprehensive services to aid people in various scenarios. Mobile phones have brought about the commencement of the next social revolution as evident in the boom of social networks. Today, mobile phones are common, portable, convenient and affordable electronic devices, some with the ability to transit information through wireless networks (smartphones and personal digital assistants {PDAs} like Apple's iPhone and iPads and iWatch, Windows Lumia, Research In Motion's blackberry and Android operating mobile devices) and others with the basic ability to receive and send information over telephone line networks. Mobile computing can be referred to as computing environment over physical mobility. It is the interaction between humans and computers, regardless of the location; that is to say the user of a mobile computing environment will be able to access data, information or logical objects from any device in any network while on the move.

Mobile devices are hand-held computing devices, with the capability of transmitting and receiving information over a network. Examples are tablets PCs, cellular telephones, PDAs, smartphones with access to a network, electronic readers, just to name a few[9]. In this technology era, mobile devices are produced with more power and memory, touch-screen ability, and a large displays with multicolour, enough to rival other complex but

computing device. These major improvements in technology and characteristics make mobile device plausible to solve problems and can replace the graphical user interface of some existing systems. Almost every person owns a mobile device using it not only to communicate but also, to access their favourite Web sites and content whenever they want, regardless of their physical location or computer access. As the use of information technology becomes more entrenched, tourists, in turn, have become more sophisticated, requiring timely, higher quality information and services to satisfy their needs. Tourism-related organizations have responded by introducing new systems, products and services. A key development in the tourism sector is the increasing popularity of mobile or handheld devices including personal digital assistants (PDAs) and smartphones that combine the power of computing and communication into a single device. Innovative mobile services have a huge potential for tourism-related organizations in terms of both increased market share, and the perceived quality (in terms of reliability, accuracy and timeliness) of information and services by tourists [4]. Such services are fast emerging and examples include maps, personal navigation systems and location-based mobile guides. People travel for many purposes: on business, for recreation, education, and entertainment, to meet business partners, friends and family. They often strive to combine several purposes while travelling. Not so many years ago, travelling required serious preparation: booking with the help of travel agents, buying guidebooks and maps, collecting brochures, catalogues and leaflets. Today, new technologies allow more flexible access to information, booking services, and other tourist support. Therefore, this study proposes a mobile application that provides tourist guidance services through mobile devices to the final users. This application's goal is to provide a better user experience by taking advantage of newest technologies. The main function of this application is to provide tourists and travellers an information directory that will be useful whether they are online or offline.

#### A. Understanding Tourism

Tourism comprises the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes. (United Nations World Tourism Organization, 2008). The World Tourism Organization defines tourism more generally, in

terms which go "beyond the common perception of tourism as being limited to holiday activity only.

An expanded definition given [7] refers to "tourism as a travel and temporary stay involving at least one night away from the region of a person's usual home that is undertaken with the major expectation of satisfying leisure needs that are perceived as being at places outside of, and qualitatively different to, the home region."

Tourism is a social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes. Tourism may be international, or within the traveler's country.

#### B. Tourism in Nigeria

**History is instructive in a study of tourism, not simply because there maybe lessons to learn, but rather because the seeds of future growth are to be found in the past. Tourism is said to be as old as humanity. Writers on the subject have always traced the beginning of tourism to when life started on earth [17]. The history of tourism in Nigeria is traced to the beginning of life and ancient civilization. According to [14], History tells us that our fore-fathers offered hospitality and tourism services to strangers willingly. They were in the habit of being their brothers keepers Our fore fathers practiced hospitality even before the arrival of the 'white man'. However, it was the colonialists that commercialized hospitality as trade and commerce". Also, [11] noted that tourism development in Nigeria started in 1962. According to him, tourism in Nigeria started with the formation of a body called Nigerian Tourist Association (NTA) in 1962. The body had the recognition of the International Union of Official Travel Organization (IUOTO), now known as World Tourism Organization (WTO). Because of the pressure from NTA, Government in 1971 engaged the African Development Bank (ADB) to conduct feasibility study to ascertain the tourism potential of Nigeria. At the end of the exercise ADB report indicated that Nigeria has huge tourism potential that can fuel its economic development. Acting on the recommendation of the study, the Federal Government of Nigeria promulgated Decree No. 54 of 1976. The Decree established the Nigeria Tourism Board (NTB) in 1976 to replace the erstwhile Nigerian Tourist Association. In 1989 a**

national conference on tourism was held in Maiduguri. The objective of the conference was to appraise the state of tourism development in Nigeria vis a vis the performance of NTB. The recommendation from the conference led to the establishment of a department of tourism in the Ministry of Trade. In 1992, Decree No. 54 of 1976 was replaced by Decree 81 of 1992. The Decree replaced the erstwhile NTB and in turn established the Nigeria Tourism Development Corporation (NTDC). It has since then become the apex tourism agency of the Federal Government of Nigeria charged with the overall responsibility of promoting, marketing and coordinating tourism activities in Nigeria.

**C. Mobile Applications**

A mobile application is a software application developed specifically for use on small, wireless computing device such as smartphones or tablets rather than desktops or laptops. Types of mobile

application include: Native app, Mobile Web app and Hybrid app.[12]

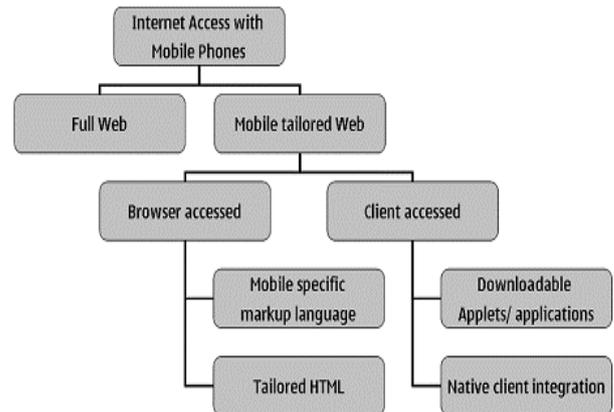


Figure1: Landscape of Mobile Internet

**Mobile Native app Versus Mobile web-based apps**

Table1: Comparison between mobile native application and mobile web application [12]

parameters	Mobile native app	Mobile web-based apps
development	Each mobile application development platform has its own native programming language: Java (Android), Objective-C (iOS), and Visual C++ (Windows Mobile)	Web apps are written in HTML5, CSS3, JavaScript and server-side languages or web application frameworks of the developer's choice (e.g. PHP, Rails, Python)
Capabilities	Can interface with the device's native features, information and hardware (camera, microphone, contacts)	Web apps can access a limited amount of the device's native features and information (Orientation, geolocation, media)
platform	It is usually downloaded onto a mobile device and installed and run as a standalone application.	It can be accessed through a web browser either on mobile device or on laptop or desktop. I.e. no software is installed.
updates	Users must manually download and install app updates	Updates are made to the web server without user intervention
method of delivery	There are stores and marketplaces to help users and your app	Since there is no app store for the Mobile Web, it can be harder for users to and your app
internet connectivity	internet connectivity is not always required	Without internet access the website would not open.

**II.OBJECTIVES.**

The objective of this work is to design a prototype of a mobile tourist directory can be accessed through wireless devices such as mobile phones, personal digital assistants (PDAs) for the Federal Capital Territory of Nigeria (Abuja).

**III. MOTIVATION**

Tourists often get to a new city and find it difficult to get information about various place of interest (POIs). Tourist information is obtained mainly through newspaper, magazines e.g. Lagos handbook, radio, information from friends and family, adverts, and other simple ways those are available easily. But problem is that tourists are

not able to get travel information timely when they are on the move. While today's mobile devices are becoming more intelligent, compared with PC, it is portable, convenient and widespread. Although many mobiles of recent decades have travel guide application but they have various limitations that this application can solve.

#### V.SCOPE OF THE STUDY

The study focuses on a mobile application that provides tourist guidance services through mobile devices to the final users. This application's goal is to provide a better user experience by taking advantage of newest technologies in order to spread information about Abuja metropolis. The information can be accessed wirelessly by the tourist in online and off-line modes. This mobile application should provide: easy access, information about the desired place and recommendations for probable places of interest. This mobile web application provides information about galleries, accommodations, restaurants, and shops and also, other important landmarks and cultural places of the city of Abuja that a future visitor or tourist can find them interesting.

#### VI.THE PROPOSED SYSTEM

The proposed system is equipped with a user-friendly touch screen application that runs on devices with android operating system this include mobile phones and tablets such as Samsung, infinix, htc, tecno brands. For completing the process at back-end we use MySQL which will be hosted online for the online mode. The offline data is remote to the application i.e. it is coded directly into the application. For this system, there would be a system administrator who will have the rights to enter information about places of interest. The administrator can enter anytime in the system by a secured authorization to make changes to the content by adding or deleting or changing contact information. When the tourist enters a new city, such tourist will be able to view necessary information with the help of the application on his android device using the graphical user interface (GUI), right from the selection of interest to when he views desired details. He will select from the place of interest options according to his choice, the system will display list of different options and information on his choice. He will have the option of going back or searching for other places of interest. The proposed prototype will solve the

existing problem in Abuja Metropolis faced by tourist which include: Information about tourist interest are usually in printed form such as flyers, adverts in newspapers or magazines and so on and while in transit this information can be lost. Inability to access the internet, can leave the tourist stranded and Time wasted in trying to find POI

#### A. Methodology

The methodology used in this work involves the gathering of facts about the existing system. The purpose of this is to thoroughly analyse it in order to identify the inefficiencies associated with the existing system and determine the requirement analysis for the proposed system.

The specific methods used in collecting data about requirements in the proposed system are more than one so as to ascertain accurate results and a comprehensive investigation. They include interview and direct Observation

#### B. System Architectural Design

**The architecture of the proposed system is presented in Figure2 below. The system comprises of mobile forms usually referred to as activity and embedded database.** The architecture is modular and all functionalities are delivered using JAVA Programming language and XML. MySQL was used for Database.

- Mobile Service

The mobile service is responsible for fetching the required template from the database based on the selected point of interest by the user.

- Online Update Service

The online update service can be used to update the application anytime through a cloud based service and the updates are automatically reflected in the mobile application hence making it easy to make changes to the information rendered to the users and making it more up to date always.

- Working Memory (WM)

Working memory refers to the available RAM for storing data used by the system and allows buffering, it is therefore recommended for each workstation to a valid working memory.

- Embedded Database: Specification and Design

The embedded database is designed to hold data for a the particular application domain, these are the information making up the template, the database is designed using MySQL.

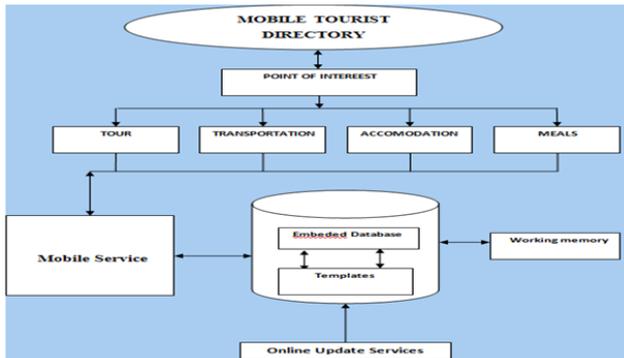


Figure 2: Architectural System for mobile tourist directory

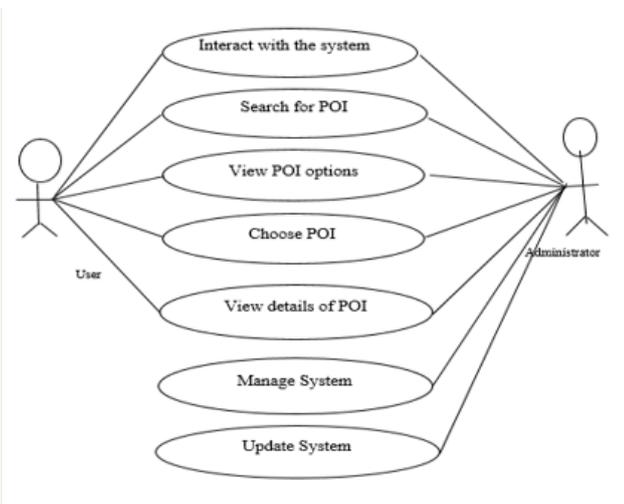


Figure 3. Activity diagram of the system

Table 2. Glossary representation for the case diagram

Use case name	Description	Actors Involved
Start menu	This is the first interface the users sees once he or she clicks on the application icon	Users
Select POI option	The user is supposed to select a category of interest, either hotels, restaurants, boutiques from the options listed.	Users
View details on selected POI	Here, a list of the selected POI is made available. For instance, if the user selected hotel, a list of hotels and their contact information will be show.	Users
Back to main category	If the users wants to view other information on other places, he or she can easily navigate back to the main menu	Users
Update database	If new POIs are discovered or the contact information of a POI which is stored in the database is changed, the database will be updated.	Administrator

VII. GRAPHICAL USER INTERFACE DESIGN  
 The mobile tourist directory is a prototype and has not been commissioned for use by tourist companies in Abuja, but if commissioned it will be

C. Conceptual Diagram: The UML diagrams that will be used to model this system are follows; Use case diagram, sequence diagram and the activity diagram.

Activity diagram: is used in the analysis of this system to show diagrammatically the sequence of activities involved in the system.

Use case diagram: shows the main actors of the system and the roles and activities they perform in the system.

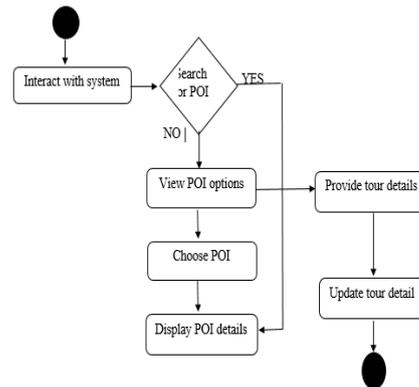


Figure 4. Use case diagram of the system

downloaded from the app store using internet service and installed to an android device either a tablet or a mobile phone. Where it will be able to in online and off-line mode, depending on the user

preference. The application can be run and developed with the following minimum software requirements: Android OS 2.2 and above, also device with screen size idpi, mdpi, tvdpi, hdpi, xhdpi, xxhdpi of the android device.

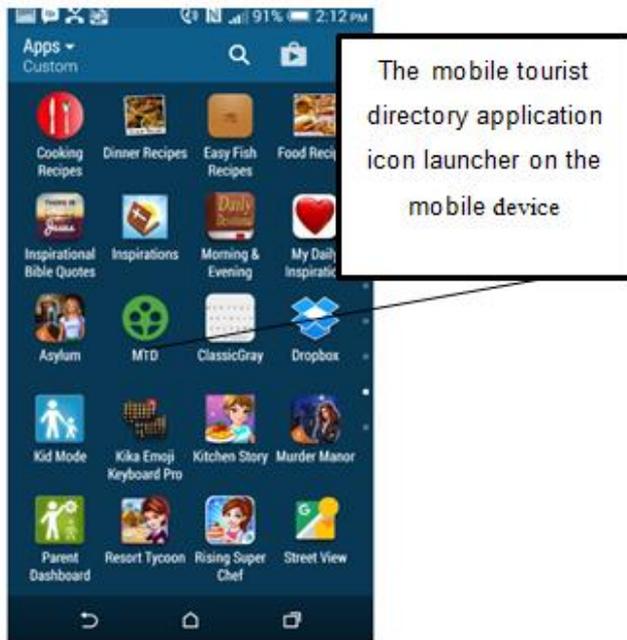


Figure 5: Mobile tourist guide icon

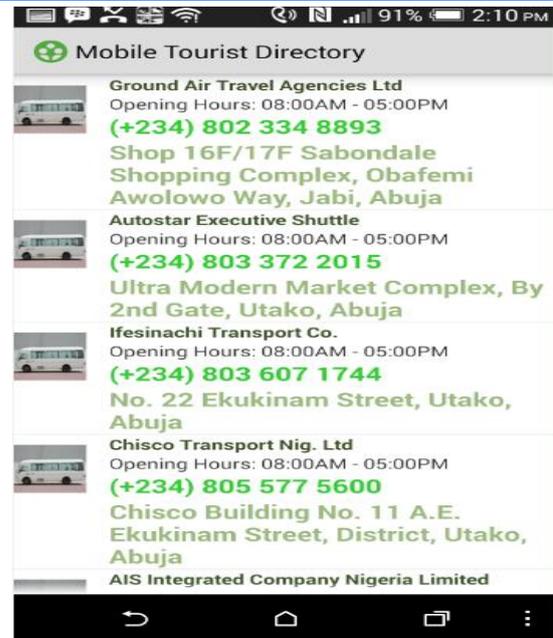


Figure 7: Transportation page screenshots

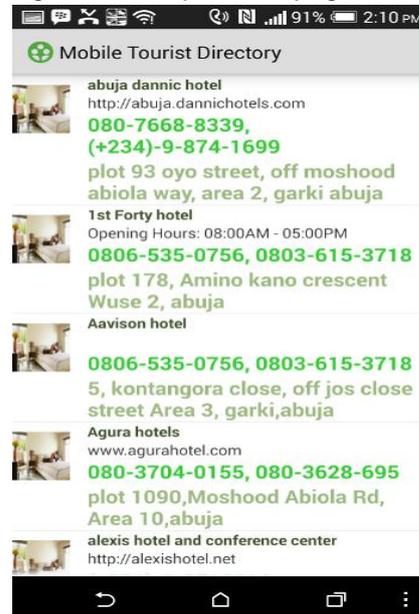


Figure 8: Hotels page screenshot

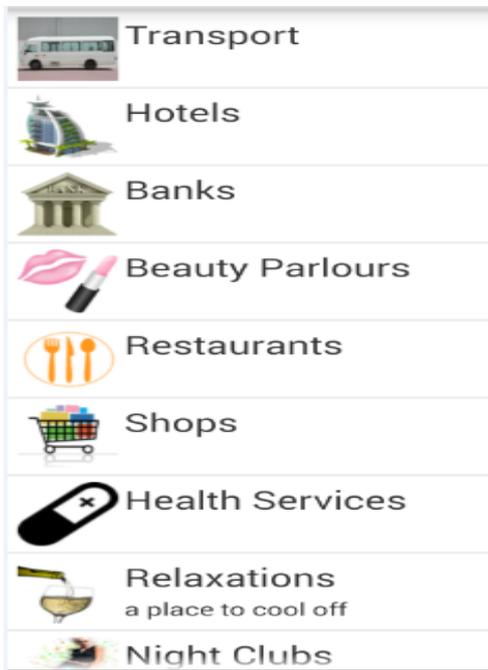


Figure 6: Home screen

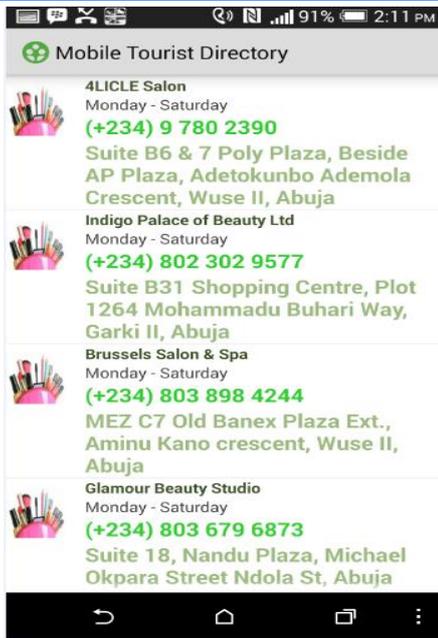


Figure 9: Beauty parlours page



Figure 11: Health services Address

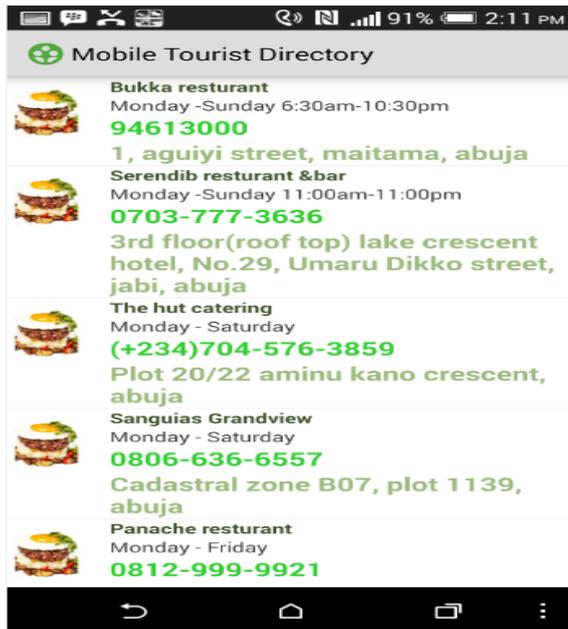


Figure 10: Eateries page screenshot

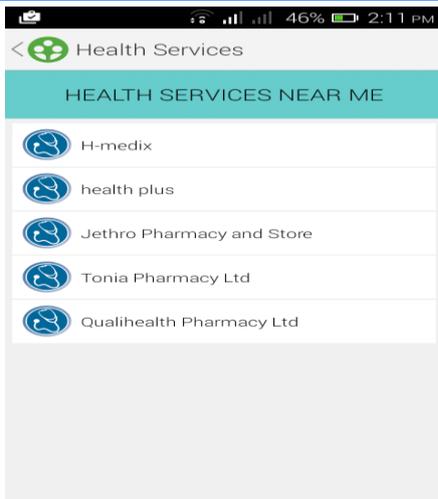


Figure 12: Health services page

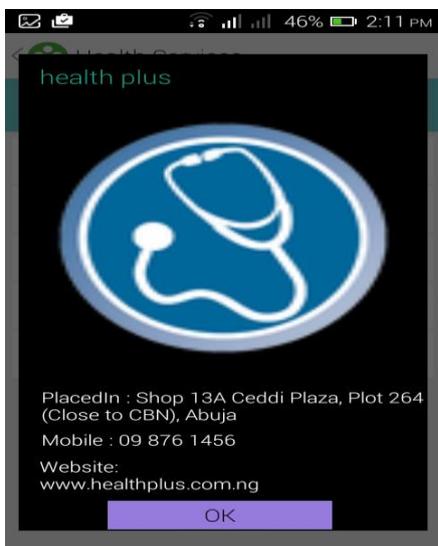


Figure 13: Contact page

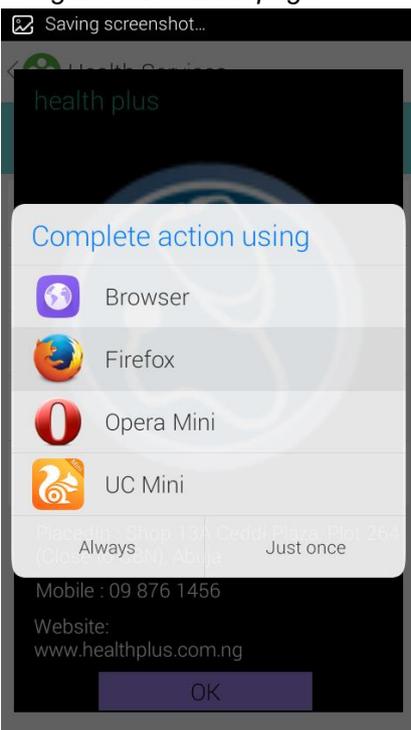


Figure 14: Navigation to website

Figure5: illustrates the mobile tourist directory icon on the screen of the mobile device. It appears after the application has been downloaded and installed.

Figure 6: is the mobile tourist directory home screen, it has nine categories. From each of these categories, user can chose any category of their choice. The user can chose only one option at a time.

Figure7: illustrates the transport screenshot. This screen shows a list of transport companies available in Abuja alongside their contact which include address, phone number and so on.

Figure8: illustrates the hotel screenshot. This screen shows a list of hotel available in Abuja alongside their contact which include address, phone number and so on.

Figure9: illustrates the beauty salon screenshot. This screen shows a list of beauty salons available in Abuja alongside their contact which include address, phone number and so on.

Figure10: illustrates the restaurants screenshot. This screen shows a list of restaurants available in Abuja alongside their contact which include address, phone number and so on.

Figure11 illustrates the health services screenshot. This screen shows a list of health services available in Abuja alongside their contact which include address, phone number and so on.

Figure 12: this is the list showing the health services online. This screen is visible if internet connection is available.

Figure 13 illustrates the contact details. This screen shows available contact details on the selected place of interest.

Figure 14: this screen shows when you want to navigate a selected website. This screen is visible to selected from available browsers on your mobile device, to navigate to the website of the selected place of interest.

## VIII. CONCLUSION

The project "mobile tourist directory" is a mobile based application. It is designed to meet the need of tourists to Abuja either on vacation, business, or studies. It is developed in java using eclipse and Php MyAdmin/MySQL for the database. The system is easy to understand and useful. The software has a user-friendly screen and interface that enables user to make use of without any difficult. Provisions have been put in place to update the software. Hence, This application software will work efficiently and effectively.

IX. REFERENCES

- [1] Bhatia A.K. (2006). "The Business of Tourism: Concepts and Strategies" [https://www.google.com.ng/search?q=the+business+of+tourism:+concepts+and+strategies+by+a.k.+bhatia&biw=1150&bih=655&noj=1&source=lnms&tbm=bks&sa=X&ved=0ahUKEwjVr-3zir3LAhWLAxoKHWbICNcQ\\_AUIDSgB](https://www.google.com.ng/search?q=the+business+of+tourism:+concepts+and+strategies+by+a.k.+bhatia&biw=1150&bih=655&noj=1&source=lnms&tbm=bks&sa=X&ved=0ahUKEwjVr-3zir3LAhWLAxoKHWbICNcQ_AUIDSgB) date visited 17/02/16
- [2] Bjørneseth F.B.(2005):"Mobile Tourist Guide" date visited 06/03/16 <https://personal.cis.strath.ac.uk/mark.dunlop/misc/cit/projects/library/05/Froy.pdf>
- [3] Choo W.O. and Shahryar S. (2013). "Mini literature analysis on information technology definition". Information and knowledge management. ISSN 2224-896X (online) Vol. 3, No 2, 2013.
- [4] DadapeJinendra R.,JadhavBhagyashri R., GaidhaniPranav Y. andVyavahareSeema U. (2012). "Smart Travel Guide: Application for Android Mobile".1st International
- [5] Conference on Recent Trends in Engineering & Technology, Mar-2012. Special Issue of International Journal of electronics, Communication & Soft Computing Science & Engineering, ISSN: 2277-9477
- [6] Goh, D.H.,Ang, R.P., Lee, C.S., and Lee, C.K. (2010). "Determining services for the mobile tourist". Journal of Computer Information Systems, 51(1), 31-40.
- [7] Grün C., Werthner H., Proll B. and Schwinger W.(2008). "Assisting Tourists on the Move -An Evaluation of Mobile Tourist Guides"2008 7th International Conference on Mobile Business ISSN 1935-4908.Pages 171-180.
- [8] Hanjie S. (2010). "City Guide over Android".Available [https://www.sintef.no/globalassets/project/ubicom\\_pforall/student-projects/project-report---hanje-shu---city-guide-over-android.pdf](https://www.sintef.no/globalassets/project/ubicom_pforall/student-projects/project-report---hanje-shu---city-guide-over-android.pdf)date visited 12/4/2016
- [9] Jayapalan N. (2001) "introduction to tourism" available at date visited 06/03/16<https://books.google.com.ng/books?id=HFWjoeVCLk0C&pg=PA41&lpg=PA41&dq=tourism+its+components+and+elements&source=bl&ots=hxnDLxa3AI&sig=GrnsqeEyyux5Jh0in1TMo9niN04&hl=en&sa=X&ved=0ahUKEwjNkdHH7JvLAhWkK5oKHT4aDVoQ6AEIMzAC#v=onepage&q=tourism%20its%20components%20and%20elements&f=false>
- [10] Karatzas G. (2010): "Mobile Web Tourism Application" Available [http://www.gkaratzas.com/downloads/Georgios\\_Karatzas-MscThesis.pdf](http://www.gkaratzas.com/downloads/Georgios_Karatzas-MscThesis.pdf) date visited 12/4/2016.
- [11] Kenteris M, Gavalas D., Economou D. (2009). "An innovative mobile electronic tourist guide application".
- [12] Lickorism J.L. (1997). "An Introduction to Tourism" date visited 03/03/16
- [13] Mia Klaus (2016) "advantages and disadvantages of java application development".<http://www.selfgrowth.com/articles/advantages-and-disadvantages-of-java-application-development> date accessed 14/06/2016.
- [14] Mudge J.T. (2012). "Native App vs. Mobile Web App: A Quick Comparison". Available <http://sixrevisions.com/mobile/nativeappvsmobilewebappcomparison/> date visited 9/4/2016
- [15] Ogbu S.E., Idris S.,Ijagbemi A.B. (2011). "Information and Communication Technology (ICT): A Veritable Tool For Tourism Development In Nigeria".Nigeria Computer Society (NCS): 10TH International Conference – JULY 25-29, 2011
- [16] Samra M. (2011). "The role and benefits of mobile Phone apps in today's world".<http://www.newbusiness.co.uk/articles/itadvice/theroleandbenefitsmobilephoneappstodayworld> Available date visited 9/4/2016
- [17] Smirnov A., Kashevnik A.,Ponomarev A., Nikolay S., (2014) "Recommendation System for Tourist Attraction Information Service". Proceeding of the 14TH Conference of FRUCT Association-ISSN 2305-7254
- [18] Vidyullata S. J., Dr. Shivaji D. M. (2011). "Information technology in Tourism". (IJCSIT) International Journal of Computer Science and Information Technologies, Vol. 2 (6) , 2822-282.