International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE)
ISSN: 0976-1353 Volume 26 Issue 7 – DECEMBER 2019.

Comparative Analysis of Native and Web-Based Mobile Application

Shilpa K C, Salma Khanum, Vinutha K J and Nithin G K ,

BE , Dept. of Information science and engineering ,Bapuji institute of engineering and technology Davangere, India

Abstract— In today's world, Smartphones are gaining popularity day by day, which is making mobile application development more popular among aspiring developers. There is a Rapid growth in the number of aspiring software developers working on mobile application development. The question, which platform is best for development continues to pop up. The aim of this study is to present a comparison between Native and Web-based application from a beginner App Developer' s perspective. We compare key characteristics of approaches, their advantages, and disadvantages. To compare App development on both the platform, we develop a mobile application called Patient-tracker in both Android and Web platform and evaluate the development process focusing on the experience of a beginner level developer. Our study presents a platform to compare the Web and Android-based application. It also reviews the similarity and differences between them. **Keywords:**

Index Terms— Web Application, Android Application, App Development.

I. INTRODUCTION

The increasing popularity of smartphones have paved the way for mobile application, and the demand for mobile application developers is increasing day by day. Currently, the two largest App distribution platforms are Google Play Store for Android users and Apple App Store for iOS users. As per the data recorded in March 2017, there are 2.8 million apps on Google Play store; Apple users were able to choose from 2.2 million applications, Windows Store had 669,000 application. Mobile applications are those that run on any mobile operating system. There is a large number of the operating system available in the market; an app is developed and operated according to their operating system. Depending on the platform chosen to develop the app, mobile apps can be categorized into two categories, Native application, and Web application. A Native app is designed and operated on a particular operating system. Special Development Kit (SDK) tools and languages provided by the platform vendor are used, by the developer.

Android applications are developed in the Android Studio using Java and XML; the iOS app is developed on Xcode using Swift. The application is directly installed on the mobile. All the data associated with the app is also generally stored on the mobile hardware. The Native app runs on device' s operating system and has access to device-specific hardware and software, i.e., it can make full utilization of mobile technology like GPS, various sensors, and camera. Internet connection may not be required depending on the type of application. An app developed for one OS cannot operate on any other OS. This is the biggest drawback of Native apps; we have to develop the same app differently for different platforms.

A web application is platform independent. It can be operated on any mobile operating system. It is developed using HTML, CSS, and Javascript. Web app runs on external servers; they are accessed through mobile' s web browser, so internet connection is required. For comparison between them, we are developing an app on both platforms. Each step of the development procedure is compared, beginning from the installation of the toolkit for development on our laptop to the final user interface of the application. The remainder of the paper is structured as follows, Section 2 consist of literary review, Section 3 talks about the UI design and Development of the application, Section 4 describes its performance evaluation and comparison of the Apps . Section 5 gives the result of the study and Section 6 concludes this paper.

II. LITERATURE REVIEW

Research for the successful completion of the study was done by examining a lot of literature written on the topic. Seung(2015) compared native and hybrid method in terms of performance cost, development cost, user interface design, and the efficiency with which both the platforms utilize device capabilities such as various sensors, cameras, network interfaces. Maryam Ahmed, Rosziati Ibrahim (2014) reviews the similarity and difference in the testing mechanism for Web application and mobile application. Also, it discusses the quality assurance provided by the web application and mobile application. Ali Mesbah et al. (2015) discuss a qualitative study fo the various issues that developer face while developing and different versions of an app for different devices. a semi-structured survey was conducted in which 12 senior mobile developers from 9 different companies, were interviewed and the information gained from the mobile development community was presented.

Arunima Jaiswal et al. (2014) focused on security issues and the main aim of the study unique challenges and problems in preventing data leakage and maintain the confidentiality of data .and help developers and software tester develop better testing tools for their related projects. Chaitanya Ekhatpurkar et al. (2016) developed an application aims to provide a solution for the lack of interaction between

the voter and the candidate. It gives voters a convenient and safe way to vote it also presents a profitable way for conducting an election and attracts voters to participate by providing the platform to interact with the candidates. Dayanand Patil (2014) discusses the Challenges & Problems in Security Testing of Web-based Applications and also about Security testing for web-based applications which is different from functional testing and usability testing in a number of ways.

III. SYSTEM ARCHITECTURE

1. Web Architecture

Android system is a Linux-based system, it has a layered architecture which consists of four layers as shown in Figure 1: Linux kernel, libraries and Android runtime, application framework and application, each lower layer provides an interacting interface to the upper layer.

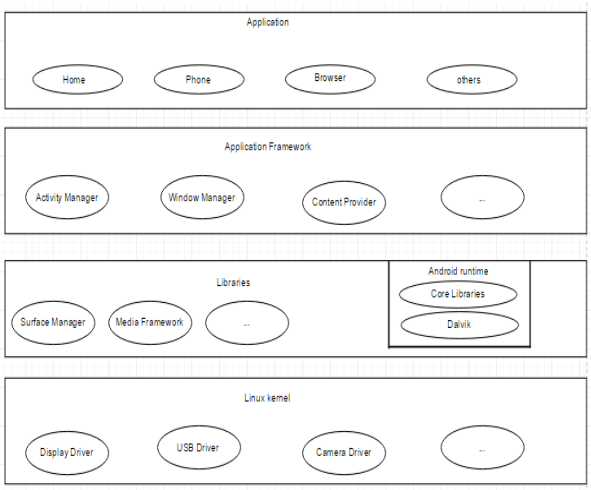


Figure 1: Android Architecture

2. Web Application Architecture

Web apps are platform independent, they are not operated on any particular system or kernel, the generic Web application architecture is client-server architecture.

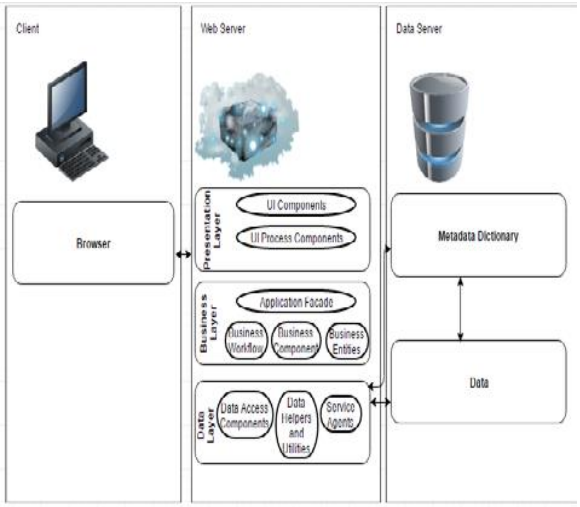
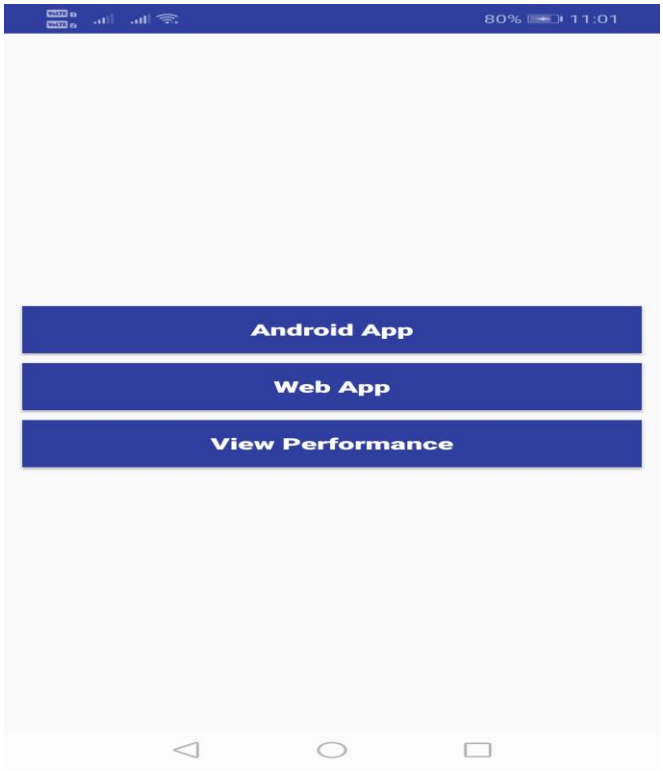
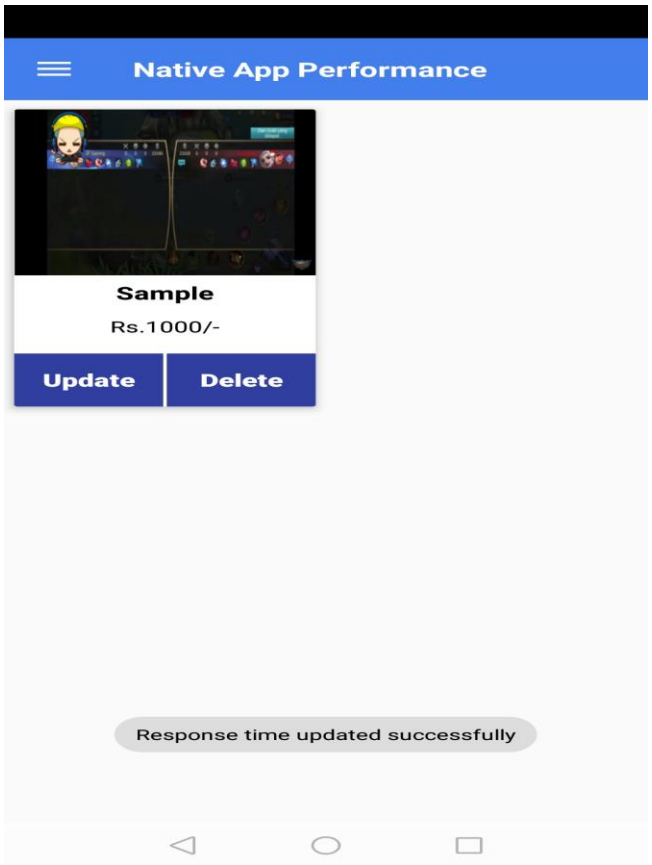
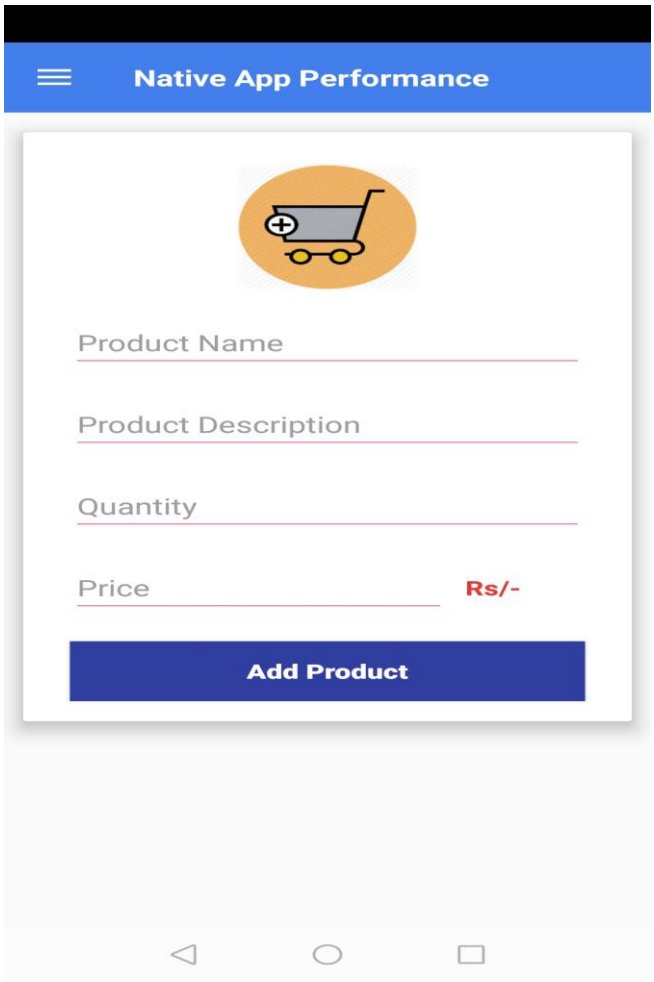


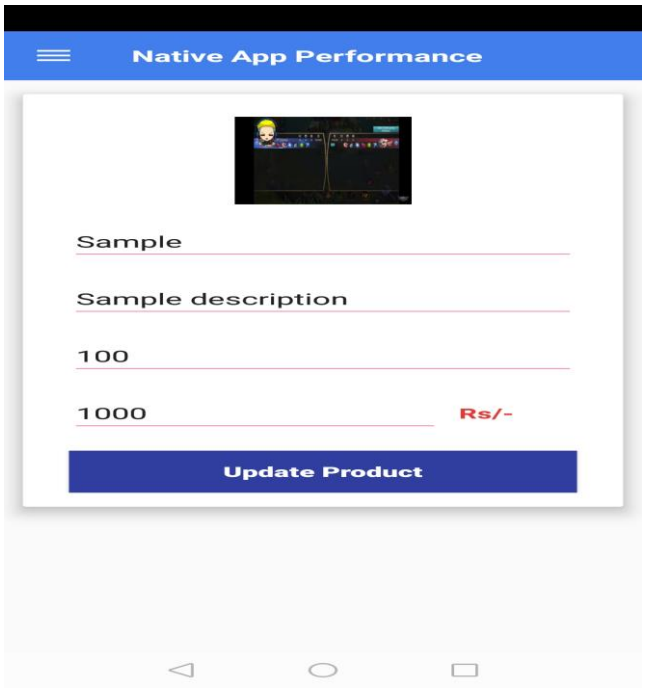
Figure 2. Web Application Architecture

IV. RESULTS









V.CONCLUSION

From this paper, we conclude that when we talk about the best solution, the answer depends on the purpose for which the App is built, the device on which it will run the user' s requirements and the budget If the application design is complex, frequently used, then the aim of the developer is to guarantee the best experience for the users, which can be best achieved by a Native application. If on the other hand, our application design is simple and not very frequently used by the user then it is much more suitable build a web app which is easier to maintain because we are standardizing the application on a single code base.

As an aspiring developer or someone who is starting with App development, Web App is best to start with. the development environment is relatively easy to install and the languages used are easier to learn. with the experience of Web App development, the developer should proceed with Android or any other Native App development as it will allow the developer to explore a lot of new functionality which was not possible with Web App development. Even though both Native and Web App continues to evolve and both will coexist for the foreseeable future, Native apps will remain the choice of users because of its richest experiences that take advantage of the latest on-board functionality.

REFERENCES

[1] Abhinav Kathuria and Anu Gupta, " Challenges in Android Application Development: A Case Study," IJCSMC, Vol. 4, Issue. 5, May 2015, pg.294 – 299
[2] Adrian Holzer and Jan Ondrus, " MOBILE APP DEVELOPMENT: NATIVE OR WEB?, " University of Lausanne
[3] Arunima Jaiswa, Gaurav Raj and Dheerendra Singh, " Security Testing of Web Applications: Issues and Challenges," International Journal of Computer Applications (0975 – 8887) Volume 88 – No.3, February 2014
[4]Cathie Norris and Elliot Soloway, " The (Native) App is Dead; Long Live the (Web) App," May 2015
[5] Chaitanya Ekhatpurkar, , Nilesh Pasalkar, Ankitkumar Singh, Jay Karkar and Prof. Priti Badone, " A Survey on Android and Web Based Application for Online Voting," International Journal of Innovative Research in Computer and Communication Engineering Vol. 4, Issue 2, February 2016
[6] Eric Umuhoza and Marco Brambilla, " Native Apps Vs. Mobile Web Apps," International Journal of Interactive Mobile Technologies (iJIM), August 2016
[7] Ivano Malavolta, " Beyond Native Apps: Web Technologies to the Rescue! (Keynote)," Vrije Universiteit Amsterdam, The Netherlands
[8] Maryam Ahmed and Rosziati Ibrahim, " A Comparative Study of Web Application Testing and Mobile Application Testing," October 2015
[9] Michael Cusumano, Alan MacCormack, Chris F. Kemerer and William Crandall, " Software Development Worldwide: The State of the Practice," IEEE Computer Society
[10] Mohammed Baqer M. Kamel and Loay E. George, " Remote Patient Tracking and Monitoring System, " IJCSMC, Vol. 2, Issue. 12, December 2013
[11] Mona Erfani Joorabchi, Ali Mesbah and Philippe Kruchten, " Real Challenges in Mobile App Development," University of British Columbia Vancouver, BC, Canada
[12] Ms. Neeta V Desai and Saniya Ansari, " Review of Patient Monitoring System with Wireless," International Journal of Advanced Research in Computer Science and Software Engineering, Volume 5, Issue 1, January 2015
[13] Nidhi Mutha, Ekta Meel , Ruchira Rokade and Prof Ganesh Deshmukh, " Patient Health Monitoring Using Android Application," International Journal of Innovative Research in Computer and Communication Engineering, Vol. 4, Issue 3, March 2016
[14] Prof. S. B. Choudhari, Chaitanya Kusurkar, Rucha Sonje, Parag Mahajan and Joanna Vaz, "Android Application for Doctor"s Appointment," International Journal of Innovative Research in Computer and Communication Engineering, Vol. 2, Issue 1, January 2014
[15] S. Sangeethaa and G. Kirubhakar, "Android Application for College Website," South Asian Journal of Engineering and Technology Vol.2, No.17 (2016) 162– 166

[16] Seung-Ho Lim, " Experimental Comparison of Hybrid and Native Applications for Mobile Systems," International Journal of Multimedia and Ubiquitous Engineering Vol. 10, No. 3 (2015), pp. 1-12, October 2015
[17] Tor-Morten Grønli, Jarle Hansen, Gheorghita Ghinea and Muhammad Younas, " Mobile application platform heterogeneity: Android vs. Windows Phone vs. iOS vs. Firefox OS," Norwegian School of IT.