



## Challenges and Issues in Android App Development- An Overview

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**Abstract**— Smart phones have changed the definition of mobile phones by being a powerful communication tool inevitable in our daily life along with varied options for fun and entertainment. It has now become a very common tool because of the popularity of android system in the electronics market. As it is an open source and some of the development tools are free, there are plenty of applications, especially related to entertainment and socializing generated, which inspires people to use it. The very convenient hardware platform is also a boon for developers so that they can spend less effort and time to realize their ideas. All these make android on demand and can get further development.

**Keywords**— Android, Smart Phones, Java, Eclipse platform, Android ADT, Android SDK

### I. INTRODUCTION

In recent years, the emergence of smart phones has changed the definition of mobile phones. Phone is no longer just a communication tool, but also an essential part of the people's communication and daily life. Various applications added unlimited fun for people's lives. It is certain that the future of the network will be the mobile terminal. Now the android system in the electronics market is becoming more and more popular, especially in the Smartphone market. Because of the open source, some of the development tools are free, so there are plenty of applications generated. This greatly inspired the people to use the android system. In addition, it provides a very convenient hardware platform for developers so that they can spend less effort to realize their ideas. This makes android popular and of course scope for further development [1].

As the smart phones and android system getting popular, the activities like listening to music, watching videos surfing the internet etc. are moved from the computer to a phone now. The major attractive feature is the lack of interference of built-in advertisements which many of us hesitate to have which we experience when using computer systems. The development of the android application can not only be limited to the function, more attention should be paid to the user's experience. After studying and experiencing some previous android applications, we decided to use the Java language, the Eclipse platform, android ADT and the android SDK to develop the mobile application for ordering food from restaurants named PikDish. This system has a nice interface and smooth operation. Besides that it won't steal any personal information and bring a wonderful user experience.

The rest of the paper is organized as follows. Section 2 gives a detailed description of android System Architecture followed by Literature Review in Section 3. The Existing System and Proposed System are given in Section 4 and 5 respectively. Sample Screen Shots of the android app named PikDish is given in Section 6. Section 7 is the Conclusion followed by References.

### II. ANDROID SYSTEM ARCHITECTURE

Android system is a Linux-based system which use the software stack architecture design patterns [1-2]. As shown in Figure 1, the android architecture consists of four layers: Linux kernel, Libraries and android runtime, Application framework and Applications [5-8]. Each lower layer provides a sort of encapsulation, while providing call interface to the upper layers.

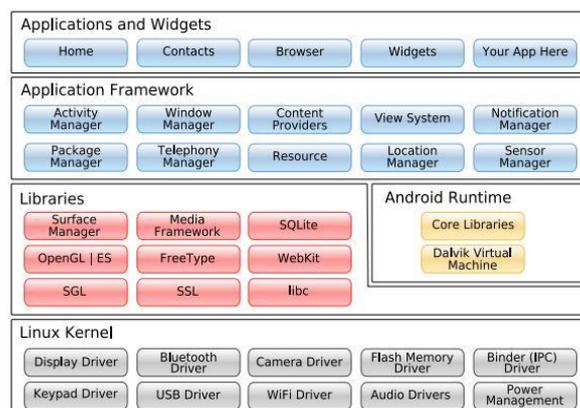


Fig.1 Android Architecture[1]

#### **A. APPLICATIONS**

Android gives a set of core applications including client, SMS program, calendar, maps, browser, contacts, and so on, all developed in Java.

#### **B. APPLICATION FRAMEWORK**

The developer is allowed to access all the API framework of the core programs. The application framework simplifies the reuse of its components. Any other app can release its functional components and all other apps can access and use this component by following the security aspects of the framework. It's quite helpful for the developers to substitute the program components with this reuse mechanism.

#### **C. LIBRARIES AND ANDROID RUN TIME**

The library is divided into two components: Android Runtime and Android Library. Android Runtime is consisted of a Java Core Library and Dalvik virtual machine. The Core Library provides Java core library with many functions. Dalvik virtual machine is a register virtual machine which makes some specific improvements for mobile device.

Android system library is to support the application framework; it is also an important link connecting between application framework and Linux Kernel. This system library is developed in C or C++ language. These libraries can also be utilized by the different components in the android system. They provide service for the developers through the application framework.

#### **D. LINUX KERNEL**

The kernel system service provided by android inner nuclear layer is based on Linux 2.6 kernel; operations like internal storage, process management, internet protocol, bottom-drive and other core service are all based on Linux kernel[1].

### **III. LITERATURE REVIEW**

The authors in [1] have tested the app in three environments including hardware, software and network. Test hardware environment is Lenovo Y460 laptop and millet M1 phone; software environment is windows 7 and phone system environment is android 4.0.3. Network environment is China Mobile which is 10M broadband, WIFI LAN and China Mobile GPRS network. By testing each function on mobile phone and the computer simulator, the result showed that video player and audio player run well and no advertising. Sina weibo client can successfully complete OAuth2.0 certificate authority and login and collect the basic data of the user information from sina server and no redundant information. Expected effect is achieved after testing all the functions. They says that since the Weibo client has to access to the network, when tested on an android phone, the performance under the environment of WIFI network and mobile 2G GPRS network can meet the expected requirements.

This article [2] gives a detailed introduction of android application framework and the working principal of android applications. Finally, a music player on the android platform was put forward as an example to illustrate this mechanism.

This paper [3] proposes a MDE approach for android applications development, which addresses how to model specific aspects of android applications, as intent and a data/service request, using standard UML notations. Moreover, it supports static and behavioral code generation from UML class and sequence diagrams, according to the rules imposed by the android platform. To demonstrate our approach, a case study was conducted, in which an android application was modeled in UML and code was generated from it. To generate code, the extension of GenCode was used. However, the actual version of GenCode tool that supports the proposed approach, only made an automatic transformation from UML class and sequence diagrams to the target android Java code, without consider any optimization in the generated code. As future work, we plan to extend this tool in order to consider the good practices for android development [16], and thus generating efficient code.

The authors in [4] say that android application development college challenge has only been held two times, but it greatly encourages and promotes the creativity of the college students. With more and more competitive teams participating the contest, it will be harder to win an award. However, many exciting applications will be presented in the contest. This challenge gives us an opportunity to learn about that a lot of ideas we think about can be implemented on android platform. At the same time, the contest provides a stage for android developer to discuss and communicate with each other. This can effectively promote the development of android and attract more software engineers to develop applications on android platform.[5]

In this research paper [6], through the introduction of the 3D maze game of gravity, understanding of the development of sensors on android platform can be experienced. They claim that with the rapid development of science and technology, the sensor's performance will be greatly improved and become more intelligent and sensitive. They also suggests that combining the characteristics of the sensor with the convenience of mobile phones, we can develop a variety of novel applications in the mobile terminal, which become handheld entertainment for people in spare time, and can provide developers with new areas for development.

This paper [7] proposed an idea to make the android application designing flow more friendly. Users can design android application without installing specific software. Users can design the application just by a browser which supports HTML5. The idea can extend to other application. It makes the gap between common user and programming designer smaller. Compare with exist tools. The idea of this paper provides a concept of module combination rather than logic accumulation. It also put development tool and deploy tool in one system. In the future, it is possible to generate a system to generate many applications for different device with only on click.

In [8] the authors specified the design of a real-time interactive model and discussed details of key techniques that make the system effective and easy to maintain. The system is abstractly divided into three layers, the Application Layer, the Data Management Layer and the Basic Service Layer. To improve the performance of the system, we add the reconnection and retransmission mechanism. The model has been successfully put into use in Hisense bus scheduling android client application.

#### **IV. EXISTING SYSTEM**

Restaurant services such as making reservations, processing orders, and delivering meals generally require waiters to input customer information and then transmit the orders to kitchen for meal preparation. When the customer pays the bill, the amount due is calculated by the cashier. Although this procedure is simple, it may significantly increase the workload of waiters and even cause errors in meal ordering or in prioritizing customers, especially when the number of customers suddenly increases during busy hours, which can seriously degrade the overall service quality.

A very commonly implemented system, currently being used by numerous restaurants and chains all over the world, is the electronic point-of-sale terminal system. Here, the servers /waiters generally take the order from the customer and head onto a terminal, where they can feed the order into a computer. The order can then be transmitted to the kitchen automatically via the terminal through a network, or it may even be delivered manually by the server to the kitchen. Although a huge improvement over the pen and paper still prevalent over the world, this does not have much value addition for the customer and mostly only benefits the establishment and the administration of the establishment.

##### **A. LIMITATION OF EXISTING SYSTEMS**

The limitations of the existing system identified are as follows;

- Cannot book the orders online.
- Cannot reserve tables online.
- Cannot check the ingredients of the food ordered.
- Cannot provide reviews or feedback of the restaurant or the food.
- Increases chaos when the restaurant is crowded during weekends.

#### **V. PROPOSED SYSTEM**

The system will consist of the following main components

1. Users - a certain number of people are made to rate individual food items.
2. Entities - the food items.
3. Value Dimensions - the categories that are formed to rate the food items e.g. Price, quality, meat content, etc.
4. Belief System - is personal to each user & allows telling the system what ideal value they want each value dimension to have.

##### **A. BENEFITS OF PROPOSED SYSTEM**

A high-quality service system is customer-centric, i.e. it immediately recognize the identities, favorite meals and expenditure records of customers which is provided by customer-centric services. Therefore, using advanced technologies to improve service quality that has attracted much attention in this application. Various product recommendation systems have been developed to enhance customer satisfaction and perceived value. It is defined as a system which recommends an appropriate product or service after learning the customer's preferences and desires.

##### **B. CHALLENGES AND ISSUES**

Some of the major challenges and issues that we have experienced while developing this app PikDish is mentioned here. The major challenge was to make the app appealing to the major crowd by making its interface simple, user-friendly and attractive and at the same time useful for the purpose. Since a number of versions of android are there and it keeps coming with new software and hardware features also which one to focus for developing the app was quite difficult to finalize. Finding mostly used version was time consuming. Same way the software/hardware integration was also a major issue. Unable to fix the errors and security issues was also quite difficult to manage. Despite these difficulties the when the app comes to realization the satisfaction we gain is amazing.

#### **VI. SAMPLE SCREEN SHOTS**



FIG 2. LOGIN SCREEN



Fig 3. Menu Screen

## VII. CONCLUSION

Android as a full, open and free mobile device platform, with its powerful function and good user experience rapidly developed into the most popular mobile operating system. This paper gives an overview of the different challenge and issues faced in android app development. It gives a detailed reference of a new app PikDish developed for restaurants. The experience of developing an android app is quite challenging, motivating as well as satisfying.

## REFERENCES

- [1] Ma, Li, Lei Gu, and Jin Wang. "Research and Development of Mobile Application for android Platform." (2014).
- [2] Liu, Jianye, and Jiankun Yu. "Research on Development of android Applications." *Fourth International conference on Intelligent Networks and Intelligent Systems*. 2011.
- [3] Parada, Abilio G., and Lisane B. de Brisolar. "A model driven approach for android applications development." *Computing System Engineering (SBESC), 2012 Brazilian Symposium on*. IEEE, 2012.
- [4] Peng, Bin, Jinming Yue, and Chen Tianzhou. "The android Application Development College Challenge." *High Performance Computing and Communication & 2012 IEEE 9th International Conference on Embedded Software and Systems (HPCC-ICSS), 2012 IEEE 14th International Conference on*. IEEE, 2012.
- [5] Grgurina, Robi, Goran Brestovac, and Tihana Galinac Grbac. "Development environment for android application development: An experience report." *MIPRO, 2011 Proceedings of the 34th International Convention*. IEEE, 2011.
- [6] Zhi-An, Yi, and Mu Chun-Miao. "The development and application of sensor based on android." *Information Science and Digital Content Technology (ICIDT), 2012 8th International Conference on*. Vol. 1. IEEE, 2012.
- [7] Yang, Zhilong, et al. "Research and Design of a Real-Time Interactive Application Development Model Based on the android Platform." *Computational Intelligence and Design (ISCID), 2013 Sixth International Symposium on*. Vol. 1. IEEE, 2013.