

The New Advancement in Android Application Development

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Abstract— The success of android operating systems lies in its open source nature and wide range of freely available applications. Even if today android holds big share of market, still there is need to make application available in different operating systems to make it popular and reachable to wide variety of people. Most of the firms need different set of codes and efforts if they want to develop application which will support multiple types of mobile devices and operating system. MEAP (Mobile Enterprise Application Platform) help to develop application which will require minimum coding and efforts to get deploy on different platforms. MEAP is long term approach to achieve mobility of mobile application with less effort. In this article we are presenting the study of recent android application development tools, process and methodologies.

Key words: Mobile, Paradigms, Web Development, Multiplatform

I. INTRODUCTION

Today, mobile applications are get developed as dynamic web applications rather than old-fashioned binary application. This paradigm shift in software industry is because of mobile web development tools which are versatile, useful, economic and less dependent on specific platform or SDK. These tools are evolving to offer an integral native solution that allows simplifying the software development process and broad its scope to a single cross-platform development effort.

Mobile phones were used for the phone calling in the earlier days, but now a days these devices are becoming more and more smart and interactive. Android, iOS, Windows, these are some of the operating systems of mobile phones used widely. But out of these operating systems, Android is becoming more famous because it is open source platform. Users are allowed to customize this system and its applications as per the need; accordingly the new interesting area for programmers was introduced called Android application development.

Android has excellent documentation, powerful APIs, a thriving developer community, and no distribution or development costs. As the popularity of mobile devices is going on increasing continuously, this is an exciting opportunity to create innovative mobile phone applications no matter what your development background. For android application development, android libraries are already available in the form of java packages. These packages include pre-defined functions and classes for various operations. Users can make use of these functionalities at free of cost, and it will simplify the application development process as well as saves the time.

World wide web had started as simple document viewing platform. With induction of dynamic presentation layers and scripting languages enabled web systems to conduct simple tasks, such as filling in a form, and soon even more complex jobs like managing a database or

execute complex functions. Today, World Wide Web has achieved transition from document viewing platform to service-provider environment which provides platform to design, code, and implement systems has reached almost an unlimited scope.

Web-based application paradigm works by using web-browser as an intermediate level of abstraction that allows logic layer to be based on scripting language like JavaScript and presentation layer based on HTML and CSS making it easily portable with different web browsers. One example of this is the Google Web Toolkit that provides a complete framework for the development of applications easily deployable in a web environment.

In rapidly changing mobile technology environment, developing and marketing application successfully is not an easy task. It is necessary to keep in mind that there are various mobile platforms available such as android, iOS, Windows and each one with significant number of potential customer for new application.

Developers cannot afford to dismiss a wide range of users by developing application only for a single platform. On the other hand, conducting the whole development process for an application to be available on each platform will eventually become redundant, expensive and unpractical. Web-based paradigm will change way application is developed, as this approach slims down the mobile software development process and broads its impact. It will provide way to reduce development cost and most importantly, web-based paradigm allows developer to develop application for a variety of platforms, targeting wider extent of potential customers by conducting a single development process only.

In the scope of mobile development, developers start with selecting what platform to develop first for. The number of users on each platform and their respective market share are factors need to be for selection.

II. LOCATION BASED SERVICES OF ANDROID

Location Based Service (LBS) is a platform which provides different information services based on the current or a known location, supported by the electronic map platform. The location information (longitude latitude and coordinates) of mobile end user can be obtained through the mobile communication network or the Global Navigation Satellite Systems (GNSS). The research focusing on LBS is vast and a number of these services have been implemented and tested [1].

Different applications are developed to support the users with location information as well as geo-graphical information of the surrounding environment. These smart devices can make the use of GPS (global positioning system), GIS (geo-graphical information system), and WCT (wireless technologies) to provide such services. There are various applications which can make use of these services and get the benefits of it such as, traffic analysis and

monitoring system, emergency support services, tracking, navigation/routing, tourist guide applications etc. [5].

Context awareness systems can also be integrated with basic location based services to make applications more effective and interesting. Context based systems make the use of spatial databases which are the special type of databases, used for storage of location information with different geographical aspects. Such systems are intelligent enough to capture the user's current location and provide the information with respect to that location. Such systems are also capable of deriving unknown information (object description) from the previously known object information [7].

III. MOBILE ENTERPRISE APPLICATION PLATFORM (MEAP)

Mobile enterprise application platform (MEAP) is a broad spectrum suite of products and services with which mobile applications are developed. MEAP states various difficulties which are faced in the process of developing mobile applications and proposes the solutions over all those difficulties. MEAP also enables the developer to develop cross platform applications [9]. Main advantage of using MEAP for mobile application development is that it simplifies the development process as well as makes the process more faster than any other technology [10].

Any MEAP solution consists of two parts:

- A middle-ware server
- Mobile application client

A middle-ware server- this is a mobile application development component which handles system integration including security, scalability, cross platform support and communications. It doesn't store any data in it, all it does is manage the flow of data from back end server to the mobile device and mobile device to back end server; that's why it is called as the middleware server [6].

A. Advantages of using MEAP environment:

- Enhance existing business platforms by making them accessible to users anywhere, at any time.
- MEAP can integrate with multiple data servers at one time.
- A mobile middle ware server is used for connectivity, integration and security of the mobile application.
- It doesn't require a separate set of codes to support multiple types of mobile devices and operating systems.
- Cross-platform considerations are one big driver behind using MEAPs.

IV. MOBILE SOFTWARE DEVELOPMENT

Since introduction of smart phone, mobile development has evolved from hardware-specific software to high-level platform operating systems, each one delivering their own advantages and solutions [4]. Moreover each platform has its own programming language, standard, SDK and distribution ways. If one developer wants to develop an application for more than one platform then it is necessary task to translate original source code to the adequate one, as well as adapting APIs and low-level implementations so that the new target platform could support the application in the way it was supported in the original platform. After that, it is

mandatory to rebuild the application to obtain the proper executable code.

Mobile application development making use of web based technologies must able to provide applications matching the behaviour and capacities of the applications built using specific platform and SDK [8].

Tools like Appcelerator or PhoneGap provide a way to develop applications with a technology-neutral point of view based on JavaScript, HTML and CSS, allowing a single development to be deployed on different target platforms. This not an easy task. Unlike desktop application, in mobile application a variety of features need to take care differently such as screen orientation, touch orientation, keyboard data entry, hardware management etc. Moreover, the architecture of web applications in desktop computers allocates much of the logic on the server side; while in a mobile standalone application, it is preferable that the logic resides on the client side. [3].

V. OPPORTUNITIES AND CHALLENGES

Web-based mobile software offers advantages as:

- Reduces the need of repeating platform specific efforts through software development life cycle.
- No need of utilizing specific language, framework to get support on single platform.
- Moreover to be successful mobile multiplatform development tool, following consideration must take care of:
 - Emerging standards such as HTML5 or WebGL should be effectively used as HTML5 will provide caching and local storage capabilities that will enable web applications to operate in offline mode much like desktop applications. WebGL, on the other hand, will help to provide graphics for games This shall allow web applications to behave as full-capable applications even in offline mode [2].
 - Mobile multiplatform process should be smooth, in which multiple deployment process should be straight forward operation. Long and heavy troubleshooting task will discourage developers from accepting multiplatform tools and they may prefer traditional approach.

VI. CONCLUSION

By taking advantage of the variety and success of web technologies, multiplatform development provides the opportunity of broadening the scope of an mobile applications and increasing its impact in wider range of potential customers without covering the cost of conducting redundant activities, receiving platform-specific training, purchasing proprietary tools, etc.

Users are getting more and more dependent on various mobile devices and need of applications to make the use of such devices is rapidly going on increasing. Now a days, application development platforms like Appcelerator, PhoneGap and MEAP provides effective way to develop applications which can be run on multiple platforms. With the help of such technologies application development process is becoming more effective and faster.

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