Research on Basic Programming System of Computer Science Mobile APP Software Engineering

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Abstract. With the continuous development of computer network technology and the large-scale popularization of smart phones, mobile phone palm technology has also ushered in a golden period of rapid development. The development and use of mobile terminals provide a broad and convenient stage for the development of APP technology applications. Based on Android phones, the development and application of mobile phone APP software can effectively improve development efficiency, promote some development activities not to be restricted by time and space, improve the flexibility of the development system, and meet the development needs of the new era. Based on this, this article deeply analyzes the background of developing Android mobile phone APP software on the computer basis, from the aspects of hardware, software and operation, detailed research on software development and application, promotes the popularization of related mobile phone software technology and product promotion, and develops mobile phones for the construction of computers. The APP mode laid the foundation.

Keywords. Smart phone, computer programming, mobile phone APP, software program.

1. Introduction
With the rapid development of mobile communication technology, mobile phones have changed from a single telephone communication device to an information network terminal. Therefore, mobile phone programming has become an important technology in recent years. The mobile phone is a collection of high and new technology, including a number of technologies such as mobile terminals, embedded systems. The mobile phone programming development platform is a teaching, research and development platform that integrates theories of communication technology, embedded technology, electronic technology, software engineering, operating system, and so on [1]. By developing corresponding programs on this development platform, you can master the process and method of embedded system design; you can design and implement the basic functions and extended functions of the mobile phone according to the needs of users. The main goal of this thesis is to study the basic structure and local processing technology of mobile phones, and design and implement a mobile phone programming development platform based on this. The platform integrates a teaching and development platform for theoretical software and hardware such as communication technology, embedded technology, electronic technology, software engineering, and operating system. Corresponding experimental procedures have been developed on this development platform. Through this platform and programming, you can master the process and method of embedded system design, design and implement the basic functions and
extended functions of the mobile phone according to the needs of designers and users, and design experimental projects for programming.

2. Overview of SQL

This article requires students to take courses that produce professional-quality mobile applications and demonstrate the applications they have developed. The instructor chooses the modern mobile platform used in the course. Including MVC principles and specific tools, SQL is the standard computer language used to access and process databases is the W3C standard defined in JSR-226. It uses XML code to display two-dimensional images, animations and text in MECLDC/MIDP applications. Mobile SVG is the general name of the two mobile versions of SVG launched by W3C: SVG Tiny (SVGT, suitable for mobile devices with highly restricted resources) and SVG Basic (SVGB, suitable for high-end mobile devices). Compared with SVG, Mobile SVG has limitations in supported content, attributes and functions[1].

Compared with PNG and other raster format image file types, SVG has the following advantages: scalability. SVG can render images with the best quality under different pixel resolutions, color depths, CPU power and memory. It can also zoom the image without degrading the image quality. Smaller file size. The size of SVG files can be several times smaller than PNG files with similar quality effects, allowing developers to create graphics-rich applications on platforms with limited hardware resources. Flexible and easy-to-use file format. SVG files are stored in the form of text (XML), which is easy to edit and easy to reuse. Searchability [2]. Developers can search for text embedded in image files. For example, you can look up the names of streets or towns on a map image. Super color control. SVG images have a palette of 16 million colors and support ICC standards, RGB, linear fills and masks. Super interactive. Since SVG is based on XML, it can generate powerful dynamic interactions. SVG images may respond differently to user actions. JSR-226 is the SVG Tiny solution defined by W3C, which implements the Mobile SVG specification. JSR-226API includes 1 core application package and 3 advanced application packages. The core application package is x.microedition.m2g, which is used to load, bind and render SVG graphics. The advanced package includes org.w3c.dom, org.w3c.dom.svg and org.w3c.dom. Events, they are used to handle SVG interactive operations. Figure 1 shows the architecture design of SVGAPI in the ME platform. SQL, XML and JSON; network technology and URL loading, and finally, may depend on the details of the specific mobile platform (such as GPS and motion sensing)[3].
3. **Android mobile phone APP software development background**

With the popularity of Android phones, a solid foundation has been laid for the realization of mobile apps. In recent years, the level of computer development informatization has continued to improve, and the efficiency of computer development has become higher and higher, and higher demands have been placed on mobile phone APP software. However, the mobile phone APP market is still in the initial stage of development, and continues to accelerate its development speed and focus on developing APP software based on Android phones to meet the needs of mobile APP and efficient development in the new era. Therefore, it is necessary to deeply study the development and application of Android mobile phone APP software[4].

In recent years, with the development of the mobile Internet, mobile terminal devices have been widely popularized, and development in various fields of society has gradually begun to use mobile terminal devices such as tablets and mobile phones for mobile phones, without being restricted by time and space. Computer development in all walks of life is actively building a modern management system. In order to effectively improve management efficiency, the demand for mobile phone software in computer development is increasing. The development and application of mobile APP software based on Android phones can significantly improve development efficiency, provide convenience for related staff, promote more flexible development activities, simplify development processes, divert and simplify computer development workloads, and promote development and development. Therefore, it is necessary to in-depth study the development and application of mobile phone APP software based on Android phones to meet the development needs of the new era[5].

4. **Three mobile APP development models used in this article**

4.1. **NativeAPP**

NativeAPP development model, that is, local development model, also known as traditional development model. This development mode is developed based on the operating system of the mobile terminal, which can make good use of the hardware resources of the system. Its shortcomings are also obvious. Its applications can only be installed and used in a mobile terminal system, and due to APP's reliance on hardware, application upgrades will be more troublesome.

4.2. **WebAPP**

The development mode of WebAPP basically relies on the realization of network technology. Its APP is a Web site optimized for mobile phones. The advantage is that it is cross-platform, has almost no hardware dependence, and has a short development cycle. The disadvantage is also obvious. APP relies heavily on the network, and the data basically comes from the server, so the network status will directly affect the user[6]. Experience. In the absence of a network, the functions of the APP are basically unavailable. Moreover, the APP cannot call the hardware API of the mobile phone, and its functions are subject to certain restrictions.

4.3. **Hybrid APP**

HybridAPP development model, that is, hybrid development model. This development model uses a third-party cross-platform development framework to develop applications in one language to be compatible with different mobile devices. In this way, developers can use JavaWeb technology or another third-party development technology that is not specific to a specific system to implement application functions. APP also has cross-platform and good hardware resource calling capabilities[7].

5. **The process of APP software development used in this article**

APP software development will formulate the corresponding development process according to different product characteristics. But in a general sense, the main stages of APP software development include requirements analysis, software design, code writing, testing, and release and maintenance.
5.1. Demand analysis
Compared with other software, APP software pays more attention to the specific needs of customers. Therefore, software developers must deeply understand customer needs and clarify customer needs. According to the positioning of the APP software and the user characteristics of its target user group, the related functional requirements and friendly interface must be clarified. Appeal.

5.2. Software design
After the user needs analysis is completed, the APP software needs to be planned and designed. The design phase mainly includes functional design and interface design. The former is the core of APP software, which is designed to meet the needs of user groups through functional design; while the latter is friendly interface design. Today, with so many APPs, interface design often becomes the key and important factor in determining whether APP software will succeed in the market.

5.3. Code writing
At this stage, programmers complete the related code development and writing work according to the functional design and interface design content. According to different development models, the main programming languages include native languages ObjectC, Java, .net, etc. and web page languages HTML5+JS.

5.4. Testing phase
Testing is particularly important in APP software development. Through test feedback, APP products can be continuously revised to make them infinitely close to customer needs. Generally, APP software will produce Demo after completing the code writing work, add relevant interface elements, test it in the target customer group, collect feedback, and continue to improve.

5.5. Release and maintenance
After repeated testing and improvement, the APP software can be officially released and operated, but later software developers still need to effectively maintain the software to deal with emergencies.

Figure 2. Main program flow
6. Research on the key technology of computer development of mobile phone APP

At present, Android system and IOS system are two important types of operating systems for mobile phone terminals, and according to relevant survey data, more than 98% of the mobile operating system market is currently based on these two types of operating systems, and more than 80% of them are Android systems. System types are different, and software development methods are also quite different. The Android system is an open source system, the development language is JAVA, and the system development has a very high degree of freedom, and the development cost and threshold are relatively low; while the IOS system is a non-open source system, the main development language is Object-C, and the system development freedom is relatively lower, the development cost and threshold are also relatively high.

The computer webpage or computer client can directly access the computer database, so as to obtain relevant data information according to the operation of the software, and can smoothly implement operations such as deleting, adding, and modifying data. However, mobile phone software is different due to platform differences, and more complicated connection methods are required to connect to the database. At present, the most common connection method is to develop the WebService background program and treat it as a transit, in which logic is written in a custom form, in order to achieve the purpose of operating database data. After the publishing operation is implemented in the server, the Android program can use the publishing address and the specified method name to set the relevant parameters and perform indirect operations on the database data.

The development of the Android mobile phone APP software is based on the Android system, using WebService as a background program, which can promote the transfer of some operating functions involved in the computer development of the intranet to the mobile terminal, and operate the text download and browsing on the Android mobile phone. Features. After registering and logging in on the mobile APP, developers can operate delete, add, review, and modify functions according to their own permissions, as well as operate file download, delete, and browse functions. The mobile phone APP software can be directly on the mobile terminal, through the external network to achieve direct access to the internal network web page, effectively realizing the mobile phone. This development APP software is connected to the VPN dedicated line, and users can log in and operate the software directly through Wifi or mobile phone traffic, and the development flexibility is higher. This mobile phone APP software program memory is relatively small, less than 1M, after the user installs the system, it will hardly affect the fuselage storage and mobile phone performance.

![Figure 3](image_url)  
**Figure 3.** The key technology of computer development of mobile phone APP

Almost all Android phones on the market can be installed and used smoothly. When designing the front-end interface of the APP software, a combination of linear layout and relative layout is used, and the interface layout is more reasonable and compact. In terms of software function operation, the foreground operation interface can use the HttpPost communication method to call the WebService
interface set in the background to smoothly obtain the required data and complete the relevant operations on the foreground interface. The operation data can then be submitted to the WebService through the interface. In this way, data interaction and functional operations can be smoothly realized. Publishing WebService in the VPN server promotes the smooth connection between the internal network and the external network developed by the computer. WebService can obtain and operate relevant data on the basis of connecting to the internal network of the computer development, and then use the external network port to disclose the interface, so that the Android mobile phone APP can smoothly access the relevant data in the external network environment, and the mobile phone APP can be intuitively browsed Intranet data.

The data acquisition method involved in the computer development and distribution function is relatively complicated, and the exposure of the internal file address cannot be used alone to prompt the APP to download by itself. Therefore, in the internal network environment, the WebService first combines the internal network address to download the file. But the WebService background program is based on the .Net platform, and the Android mobile phone APP software is an application based on the Java platform. There are differences in the data exchange process between the two. It is very likely that there will be abnormalities in the data analysis and receiving links, so it is not recommended through file streaming, direct transmission is realized in network transmission. WebService is required to parse the file stream into a byte stream in the basic form after downloading the file stream, so as to realize the transmission. After the byte stream is transmitted to the APP, it is further converted to the file stream, and the conversion result is saved locally, so as to ensure that the computer development and distribution file can be downloaded smoothly. After the download is completed on the APP, you can automatically call the application software in the mobile phone system, open the downloaded file through the best method, and browse the file. The flow of the main program is shown in Figure 4.

7. Conclusion
Because the application and development of computers and mobile phones have many similarities on the technical level, the rapid development of computer technology has provided a good foundation and bridge for the development of handheld technology and technology grafting. The popularity of mobile phones and the continuous development of various mobile phone software make the development of APP technology applications face more intense competition. For the development and application of APP technology, it currently has outstanding problems such as excessive reliance on the technology and platform of Apple mobile phones for APP application development, traditional language programs, fierce competition within the APP software application mall, and insufficient application of APP software. All need to be improved and perfected. By analyzing the three aspects of APP technology, the problems in APP technology application development, and the future prospects of APP technology application development, we hope to fully grasp the current obstacles to the development of APP technology, and take the problem-oriented approach to seek more scientific development path to better respond to the challenges of the future market.

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