Research on Application based on Android System

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Abstract. Applications based on android system afford great convenience for life and work, and more and more applications like this have been developed. This paper takes example of Analytical Hierarchy Process to research the application based on android system, provides the process of analysis and design for AHP application, successfully implements the application, and tests it. The test results show the feasibility of this application.

Keywords: Android; Application; Design

1   Introduction

1.1   Android Introduction

Android system can be divided into four level structure modes. From down to top, they are Linux Kernel, Libraries and Android Runtime, Application Framework and Application. In Android system, Linux Kernel works as the bridge between hardware and software and provides system service based on Linux 2.6[1]. For example: security, process management, drive mode, network stack, memory management and so on [2]. As the support of application framework, Libraries and Android Runtime provide Android core library, virtual computer and lot of function library. Application Framework provides a capacious stage for Android development members and it is composed of 9 functional parts which have the respective special service functions for development members' convenient work [3]. The development efficiency will be improved by using API framework and sharing the functional modules of applications. The top level of Android is application level and it's the window to contact with customers. Besides the application provided by system, the third application can be also installed.

The soul of Android Application is its groupware and any Android application is composed of one or more groupware between which the information will be transferred by Intent [4]. Several important groupware in Android system are: Activity, Service, Broadcast Receiver and Content Provider.

1.2 AHP Introduction

AHP [5] (Analytical Hierarchy Process) is a kind of assistant decision-making method and it combines qualitative and quantitative methods to deal with a lot of practical problems. Its main idea: analyzing deeply to the relationship among these factors which should take some effect to the target, set up a layer structure, build judgment matrix for every layer according to some rules, count the weight for every factor relative to the rule, count final comprehensive weight for every factor relative to the target, and the maximum value is optimal decision [6].

2 Analysis and design for AHP module based on Android System

2.1 Analysis of AHP

AHP is an applied kind of assistance decision-making method which can be used in all areas of our lives. Now let's analyse that what functions of AHP module should have via taking an example of our life. Example: We don't know which is better when we want to buy something of which there are two kinds, A and B. The problem can be solved by AHP in this situation. According to the introduction of the second part of the article, first, AHP module should be set up. We can put the best merchandise as the target layer, and Norm layer can be determined by the merchandise's functions, price and other conditions (other characters of the merchandise). Decision layer are A and B merchandises. As Figure 2.1.
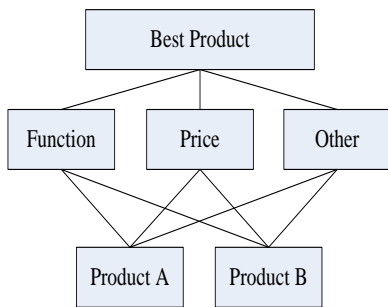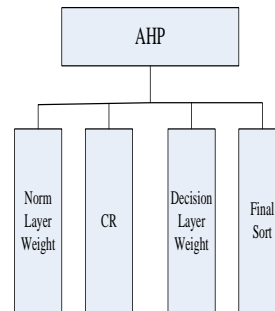

Fig. 2.1. Merchandise Hierarchy

Fig. 2.2. Functional Module

In order to get the best solution, Weights of every indicator of Norm layer for target and Decision layer for Norm layer must be got. Besides, Accordance proving value CR also should be got to test the rationality of the set-up judgment matrix. At last, weights of Decision layer should be ranked in all hierarchies. So, AHP module includes four main functional modules which are Norm Layer Weight, CR, Decision Layer Weight and Final Sort. As Figure 2.2.

2.2   AHP Design based on Android

As Figure 2.3 for the flow of AHP based on Android. There are 6 Activities to communicate to customers in one AHP. NormMatrixActivity means the judgment matrix of Norm Layer, CRActivity means the page layout when CR doesn't meet the conditions, NormWeightActivity is the Weight of Norm Layer, DecisionMatrixActivity means judgment matrix of Decision Layer, DecisionWeightActivity is the Weight of Decision Layer, ResultActivity shows the final result. NormMatrixActivity has two jump routs, one of which is jumping to CRActivity, then back to NormMatrixActivity when the result doesn't meet the conditions of CR, the other is jumping to NormWeightActivity first, then DecisionMatrixActivity when the conditions are met. It is the same as NormMatrixActivity when the dealt result of DecisionMatrixActivity doesn't meet the conditions. In the other hand, if meet, it jump to DecisionWeightActivity first, then ResultActivity to show the final result.
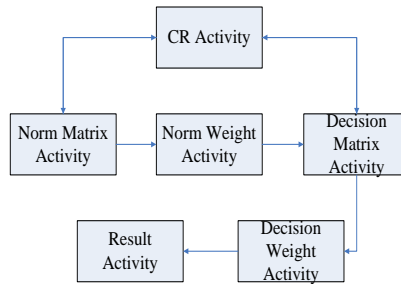

Fig. 2.3. Activity Jumping

2.3   Realization and Test

Eclipse is applied to develop AHP in the environment of Android in this article. As Figure 2.4 shows the interface of NormWeightActivity which is the executive entrance of the whole program and it means the judgment of indicator importance of Norm Layer to Target Layer. Data will be submitted to Logic Layer to be dealt with after the Enter Button is pressed when appropriate judgment value is input.

Fig. 2.4.   NormWeightActivity   **Fig. 2.5.** ResultActivity

To test the realized AHP module and refer to the main data as table 1:

Table 1. main data

Matrix	Function	Price	Other
Function	1.0	5.0	7.0
Price	0.2	1.0	3.0
Other	0.14	0.3	1.0

Result: Weight of A equals 0.66, Weight of B equals 0.34. As Figure 2.5. It indicates that A will be chosen first when data is given. The result proves AHP module based on Android is feasible and effective.

3   Conclusion

AHP module based on Android can help us to make decisions and provide convenience to our lives. The structure and main groupware of applications of Android are simply introduced in the article based on which AHP calculation is analysed detailed and designed. At last, it is realized and tested and the results indicates that AHP module based on Android is feasible and effective.

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