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DEVELOPMENT OF AN APPLICATION FOR THE E-STORE ON ANDROID

Andrey Preobrazhenskiy, Emma Lvovich, Kseniya Lvovich

Abstract:

This paper discusses the possibility of creating an application for customers of the online store based on the Android operating system. Android is a platform that allows the developer to abstract from the kernel and write in high-level languages. The framework offers a large API that allows you to create programs of completely different profiles. Android architecture is formed from many components. Each higher-level component is based on lower-level elements. The application is developed by client-server architecture. The client is the program itself. The server is a CMS platform on which the website of the online store is deployed. The latter provides a public API for the organization of external interaction with the site. Communication between the client and the server is provided by http requests and JSON messages. The basic functional requirements for the application are described. The scenario of registration in the form of a flowchart is illustrated. The scenario of interaction with the catalog is given. Shown, Kaim realized scenario of the order. Testing was carried out on the emulator and on the Sony Xperia M2 device. It shows how the user works with products.

Keywords:

Computer application, online store, Android, user.

ACM Computing Classification System:

Distributed systems organizing principles, software functional properties, specialized application languages.

Introduction

Today Android is the most popular operating system for smartphones. According to the research Gartner, now Android OS is used more, than in 87% of mobile devices. Of course, its such prevalence involves a large number of developers. Certainly, today Android is the most demanded system for mobile devices. Moreover, there is an opportunity to develop applications for this platform and to sell them in special online store. A set of development tools (Android SDK) is available for free to everyone [1].

With the growing demand for various applications for mobile platforms, the sales of relevant programs are also growing. Today, an increasing number of companies are striving to have their own smartphone application, so that the service catalog can always remain with the client “at hand”.

However, Android is not the only one operating system in the market. Consequently, there may be problems with the compatibility of applications on different operating systems, as each system developer tries to make it different from the others and more convenient for the ultimate user.

In the IT industry there is an expectation to rapidly increase the volume of software for mobile devices.

So, today the development, introduction and support of mobile programs for the Android operating system is a relevant direction in the IT sphere.

The share of the Android-applications is growing: they allow users to optimize the time to search for products, quickly find the necessary information in the network, some of them even offer some functions with voice control.

1 Architectural Features

Android is a platform that allows developers to abstract from the core and write in high-level languages. The framework offers a big API that allows to create programs of a completely different profile. Android architecture is made up of many components. Each component of a higher level is based on elements of a lower level. (Fig.1) illustrates the main components of Android.

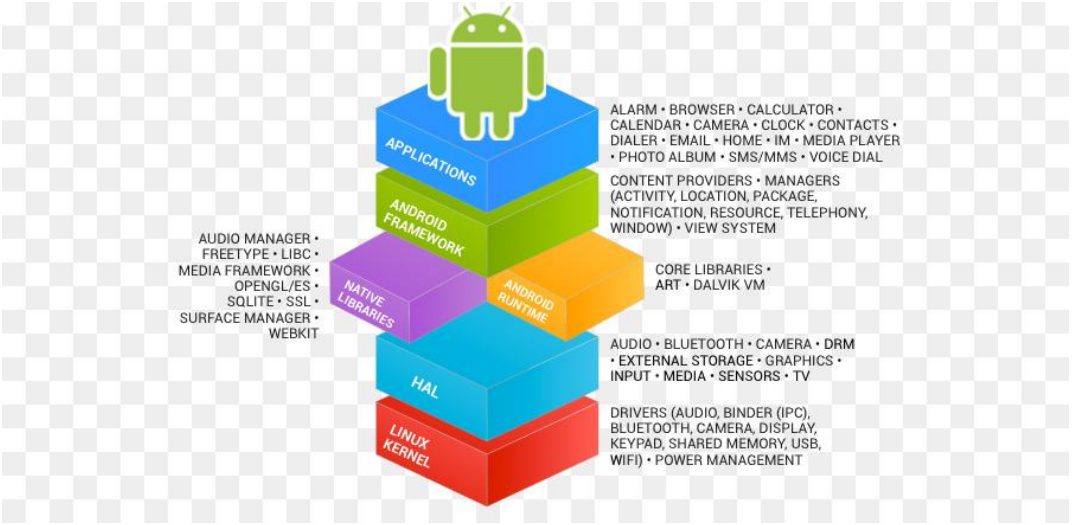

Fig.1. Main components of Android.

The basis of the platform is a modified Linux-kernel. Also at this level there are drivers for input/output devices. The core is a base of the whole operating system. Besides, the core is responsible for management of memory, processes, network support and etc.

2 Architecture of the Application

The application is developed on the client-server architecture. The client itself is the program. The server is the CMS platform on which will unroll the website's online store. The last one provides public API for the organization of external interaction with the website. Communication between the client and the server is provided using http requests and JSON messages.

Operation of the Web server is not considered, because work with it is managed through the applied interface, and is perceived as a "black box"

The application has the following entities activity: LoginActivity, RegistrationActivity, MenuActivity, CatalogActivity, ProductActivity, BasketActivity, OrderActivity, PaymentActivity and CabinetActivity.

LoginActivity represents the window displaying a greeting and a form of input of registration data with two fields: e-mail or phone and password. The form is supplied with the login button and also password recovery and registration buttons. After confirmation of the entered data and verification of their correctness by the system, the user opens an activity that displays a catalog [2].

From the system, in addition to displaying the dialog box to the user, a request is formed in the server to verify the authenticity of the entered data and, based on the CMS response, the decision to authorize the user. If registration data are correct, the system redirects it to the directory.

RegistrationActivity provides an opportunity for a new client to register on the site. The window has a welcome text, an invitation to register and a standard form: an e-mail input field and also two fields for input of the password - the second to eliminate the input error in the first one. Under the form there is a button to confirm registration. After registration confirmation the user is redirected to a personal account.

In turn, the system checks at once the matches of the entered passwords and, if they match a server request is created for signing up the new user in to the database. In case of success the system reports to the client about completion of process and redirects it to a personal account [3].

From the application side, a request is made to the CMS in order to get a list of goods and their properties, processing the response JSON message and passing the parameters to activity for displaying them to the client.

ProductActivity gives the customer the opportunity to view the full properties of the product and additional photos if they're available. The user gets to this window by clicking on any product in the catalog. Here, photos are available to the client in an enlarged size; if they are several, then browsing is organized; as well as in the table view, with the extended characteristics at a separate position for product description [4].

The system in this case provides the provision of this information to the program user by contacting the server to obtain it, processing the received data and providing them in a convenient form for the client.

BasketActivity provides the functionality of a classic basket. In this window, the client is available to view all the products that he decided to order. Here you can see the names of the catalog items, the number of units ordered, the amount separately for each item and the total value of all products. The activity is supplied with the button "issue the order" after which pressing the user gets to an order window. There is an opportunity to increase or decrease the number of items ordered.

The system adds to the cart the products from catalog, while there is no access to the server. The application has a position in a table form, convenient for viewing. The program adds or deletes a position in the basket.

OrderActivity allows to issue user's order. In this window, the user displays the number of items ordered and the amount of the order. The customer here has the opportunity to enter their contact details: phone, email, card details and choose the desirable payment method: as an individual or as a legal [5].

The application in this case checks the correctness of the entered data, then informs the user that his order has been successfully issued, that product data are valid, or specifies the reason for which next continuation is impossible for client editing. Then the application redirects the user to the order payment window.

PaymentActivity is called to pay for the order by the user. It is proposed to pay by bank transfer as an individual or as a legal entity based on the choice of the client in the checkout window. For individuals, there is a form for entering bank card details. For legal entities - bank details of the organization for invoicing by the name of the company-buyer. After the indication of all data of the user of the application, the client is redirected to the payment system window to confirm the payment, in case the user pays the order as an individual, or the client is informed about the successful execution of the order with a request to expect the manager's call for confirmation and the account for payment [6].

The application opens a payment system window for the user with a one-time security code entry form. After authorization of payment, the system returns the client to the order window, where he is informed about the successful completion of payment. After the system writes the order information [7] to the database using a request to the server.

CabinetActivity provides the user with the functionality to manage information about themselves. There, the client has the opportunity to leave personal information, such as name, phone number and email.

3 The Functionality of the Program

The system must be an application running on the Android operating system. The program should have the functionality to view the product catalog, design and order products, as well as have a personal user account and the ability to register a new client.

Functional requirements, General:

1. The system should allow to register a user
2. The system should allow editing information about users
3. The system should show a catalog of products
4. The system should display the detailed properties of each product
5. The system should provide the ability to create an order and pay for it

Registration Functionality:

The user enters the registration window. Here he enters his credentials: email, password. After the client confirms the correctness of the entered data and presses the "Register" button.

In turn the system checks correctness of input of mail, phone and also coincidence of passwords. After that, a request is made to the server, and the encrypted data is sent to the server, where register in the database. (Fig.2) illustrates the registration script as a flowchart.

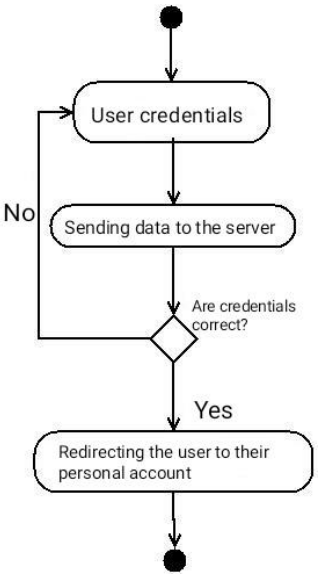

Fig.2. Registration script.

Catalog functionality:

To get to the catalog, the user needs to select the appropriate item in the menu. At the same time, he gets into a new window, where he can view the currently available products in the form of tiles. When you click on the tile product, the user opens a new window with detailed characteristics and photos. To return to the catalog window, we need to press the button "back".

When a user goes to the catalog, the system forms a request to the server to get a list of products and their properties. The application displays a list on the screen. (Fig.3) shows the user scenario in the directory.

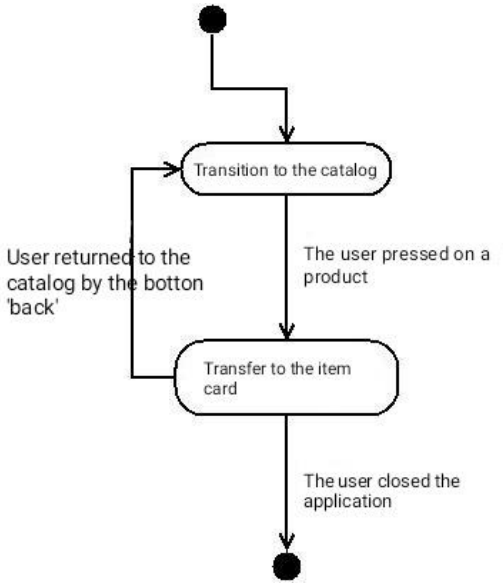

Fig.3. The scenario of interaction with the catalog.

Functional order:

The user enters the order menu by clicking on the "basket" button. It displays the name and number of products selected by the customer for the order. A transition to the order completion menu is made by the button "issue an order". Here, the application user enters his contact information for contacting and confirming the order, as well as the delivery address. After confirmation by the client, the system opens a window with a payment form. In it, the user enters data for payment of the order and confirms them.

Upon confirmation of the order by the client, the system authorizes the payment and makes a request to the server to save the order in the database. Next, the system sends an e-mail to the manager's mail. (Fig.4) illustrates the order scenario.

Testing the application:

Testing was performed on the emulator and on the Sony Xperia M2 device. The following errors were identified and corrected with the help of testing:

1. Font clipping;
2. Indents that do not match the design;
3. Errors with the display of the cursor;

4. Invalid field sizes;
5. Incorrect display of messages for the user;
6. Incorrect display on devices with a large screen size.

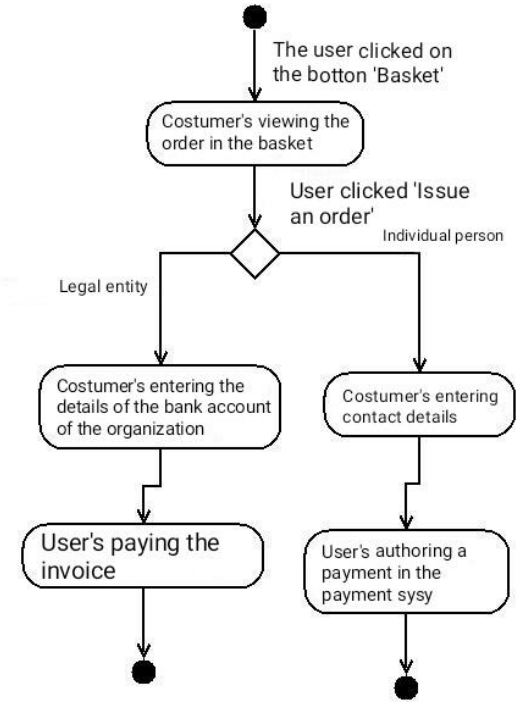

Fig.4. The order scenario.

4 Implementation of the Software

The main activity of the application is the entrance activity. Starting the application, the user gets to an entrance window where he is offered to enter the login and the password. Also there is a registration button. In the (Fig.5) entrance activity is presented.

The activity receives the login password entered and transfers them to the input of the RestAssured library.

It allows you to create JSON objects from various Java data structures, and also simplifies working with the REST API. Using the specified library, the application sends a request to the server to authorize the user. It is also possible to work with the response from the server using RestAssured. It will make analysis of the response message and will transfer to activity the answer from the server with confirmation or denial of authorization.

(Fig.6) shows a window with a catalog of products. The latter are arranged with tiles, showing a miniature photo, the name of the product and its price. By clicking on the photo, the application will go to the window with advanced product features and additional photos.

If the client wants to see the detailed properties of a particular product, he can click on the tile of the desired product. After that, he gets into the product card, where he will be able to view additional information about the product. (Fig.7), (Fig.8) and (Fig.9) show the item card.

Fig.5. Application entrance activity: Welcome, Email, Password, Enter, Registration.

Fig.6. Product catalog window: material description and price.

Fig.7. Enlarged product photo: a sponge glass gravel, diameter and volume.

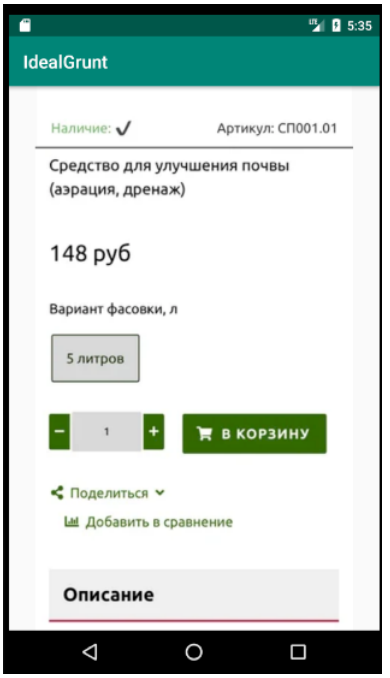

Fig.8. Availability and item of products: soil drainage product, price, quantity, into basket.

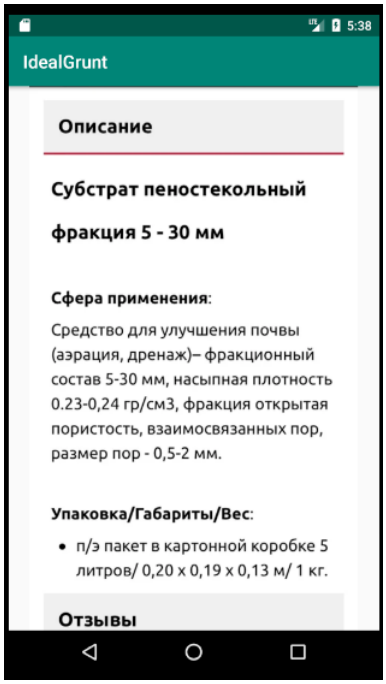

Fig.9. Detailed product description: a sponge glass gravel, size, application field, package.

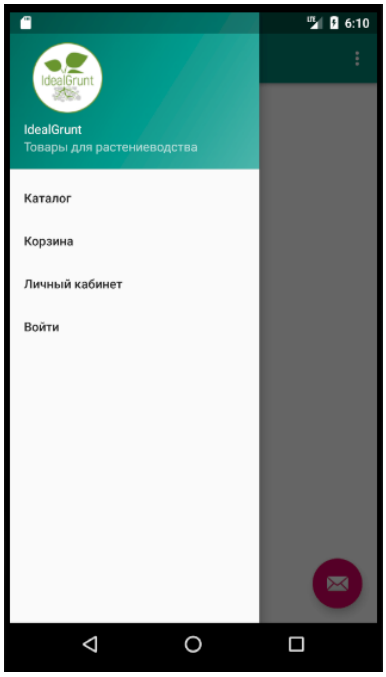

Fig.10. Navigation menu of the application:
Cultivation products - Catalogue, Basket, Personal, Enter.

Fig.11. Basket: product name, volume, price, amount (1), total, confirm.

(Fig.10) presents the application menu. The menu has navigation buttons that allow the user to go from one window to another. The client has the opportunity to go from here to the catalog, to the personal account or to the basket.

After clicking of the “Basket” button the client will be able to see products which he wishes to buy, also their quantity and the amount. (Fig.11) shows the interface of a basket.

Conclusion

The analysis showed that the development and implementation of a mobile application will contribute to the promotion of the product and increase the company's profit, because potential customers will be able to study the catalog using a smartphone. Today, commercial Internet projects are a huge success, respectively, a company that has its own high-quality website on the network has an advantage over its competitors. Especially if the organization has developed a mobile application that is integrated with the site.

A smartphone application is more a fashion tool; it is necessary that it left a positive impression of the use of customers. The convenience and speed of access to information plays a large role today, therefore, existence of the mobile application stimulates sales and attracts potential clients. Therefore high-quality development mobile ON - one of paramount tasks for the large organization. Mobile application for online store will definitely attract customers, especially the category of people with high employment. Now, it will take significantly less time to purchase the required amount of substrate, especially since it is not necessary to buy the foam glass substrate live: its appearance and fraction will be the same from batch to batch, you do not need to come to the office to see it with your own eyes. Separately, it is worth mentioning the category of people who, in principle, are more convenient to visit stores online.

Also, many people are somehow connected with the global network and it will probably be easier for them to visit an order in a virtual stores. Moreover, there the consumer can view a full range of goods quickly and get any information about the selected product.

A modern smartphone or tablet can completely replace all the functions of home computers. One of the most advanced operating systems for mobile devices is Android. Please note that mobile devices work on applications specifically written for their use, as well as applications implemented in a web form.

As a result of the work described above a goal was achieved: the application for the client of the "IdealGrunt online store" is developed. Objectives were also carried out. In the course of work selected architectural features of the Android platform were studied and used.

Testing process allowed to reveal some defects of application and to correct them in the course of development.

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Authors

Prof. Andrey Preobrazhenskiy
Doctor of Sciences (Engineering), associate professor
Voronezh Institute of High Technologies
app@vivtl.ru

Ass. prof. Emma Lvovich, PhD.
Candidate of Sciences, associate professor
Voronezh Institute of High Technologies
office@vivt.ru

Kseniya Lvovich
postgraduate student
Voronezh Institute of High Technologies
office@vivt.ru