

**JUSTIFICATION OF THE NEED TO DEVELOP AN EFFECTIVE  
MOBILE APPLICATION FOR PERSONAL FINANCIAL  
ACCOUNTING**

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**Abstract:** *The article substantiates the need to develop a convenient, intuitive and effective software application for personal financial accounting. After the analysis, it has been proven that such an application will be competitive, because existing analogues have significant shortcomings that cause not only dissatisfaction on the part of users, but also refusal to keep personal accounting. This application, in modern realities, is a necessary and convenient tool that every self-respecting member of society should "have with him".*

*As a result of the analysis of existing personal financial accounting applications, it was established that the most widespread problem is the user interface. Today, most applications use interface elements as similar as possible to the version for a personal computer, which is a fundamentally flawed flaw. The problem of functional overload and misunderstanding of basic functions by the user was also revealed.*

*On the basis of the conducted research, the prospects of developing a mobile application for personal financial accounting have been proven, which should have a client part for smartphones running the Android OS and a server application that contains all the logic and is responsible for saving and interacting with data.*

## **INTRODUCTION**

In order to have a good understanding of your financial situation and opportunities, you should follow your expenses and income very carefully, so to solve this problem you need to keep records of finances (your own bookkeeping), which is quite a difficult task if you do not use special software. It is for this purpose that numerous applications for personal computers have appeared, which provide extensive opportunities for accounting. These

applications are complex and have a lot of functionality that is needed for the accounting of large companies, but which is not necessary for a user who wants to keep his personal financial records.

Today, the problem of developing a mobile application for personal financial accounting does not belong to the range of issues that academic scientists deal with, because it does not have the character of a global economic problem, but has an exclusively practical meaning and confuses only the average user.

At the moment, there are several mobile applications available for the Android OS that deal with this problem, but most of them have not gained popularity due to a complex and unintuitive interface, as well as an overload of functionality. That is, the task of developing a mobile application for accounting of personal finances, which will combine ease of use and the necessary amount of functionality, is relevant and requires research.

The purpose of the article is to justify the need to develop a mobile application for user-friendly personal financial accounting.

### **THE MAIN PART**

The problem of financial accounting has existed almost forever, and a large number of software systems have been created to solve it. This problem is most common in medium and large companies, so today there is a large amount of software that solves the problem of accounting in companies.

Such software systems began to reach the level of personal use relatively recently, because an individual user needs a different set of functionality than an organization. There is also a need to change the approach to the design of the user interface in such a way that it is oriented towards the most urgent problems of personal accounting.

After systems for personal computers appeared, similar systems began to appear on other platforms. Thus, web and mobile applications are now very relevant, and that is why financial accounting software systems are gradually migrating to these areas.

Although the transition of such systems to mobile applications is taking place, it is very difficult to develop a mobile application with the functionality of a similar application for a personal computer - primarily because the typical needs of the user differ depending on the platform.

Thus, at the moment, most mobile applications have a large number of shortcomings that arose from a lack of understanding of the user's needs, namely, overloaded with functionality, poor user interface and unintuitive use process.

At the moment, the market of mobile applications for personal financial accounting is quite common, but almost all of them differ from the recommendations for the development of mobile application design and the organization of the use process, which negatively affects the user experience in the first place.

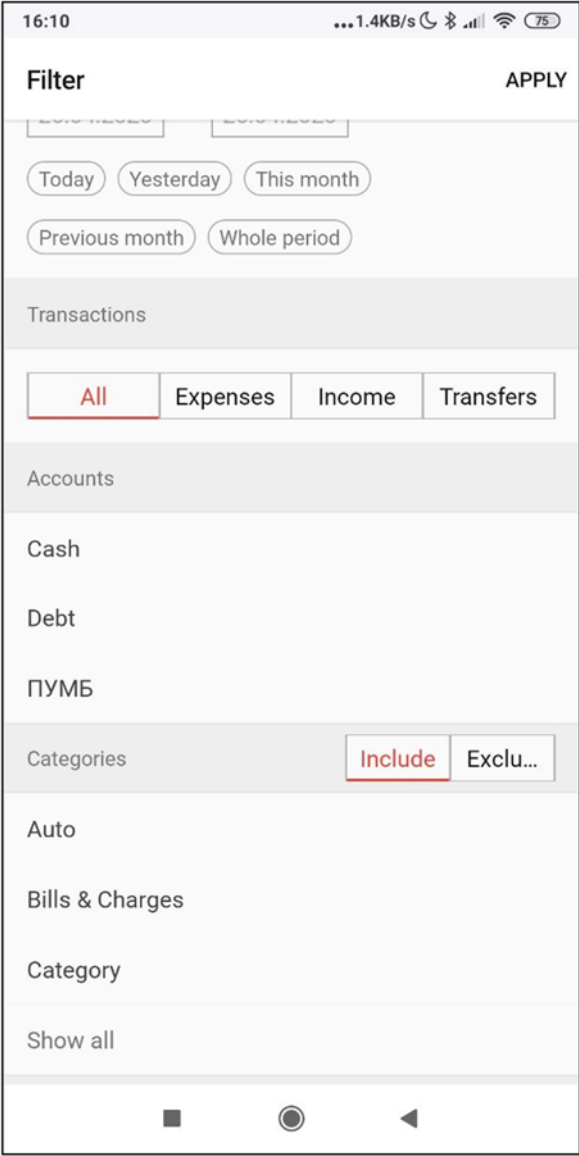
One of the characteristic features of such applications is the display of data or functionality that is incomprehensible to the user. The section of the "Analytics" application can display at the same time a very large number of different widgets, a calendar, a cost plan, a cost distribution, and several other sections, among which only two or three are intuitive. Usually, such a volume is incomprehensible and scares the user, which leads to dissatisfaction with the application.

Such shortcomings apply not only to complex things like analytics. Even something like a single transaction record tends to be very difficult to present. In order to add a typical expense that the user makes several times a day, you need to select: expense type, amount, expense category, account, date, place, comment, and optional expense repetition (day, month, repetition period), which leads to an increase in the number of actions several times. All this leads to a negative impact on the user experience because the application is designed

in a similar way to a personal computer application, where such a large number of options and actions is normal.

A general recommendation for the development of functionality in a mobile application can be considered that any action should be available to the user in 2-3 steps, which was taken into account during the development of the application.

Another example of a typical complex user interface is data filtering (Fig. 1).



**Fig. 1. Data filtering**

Among the presented options for filtering, a large number is almost always inconvenient and not needed by the user. For example, the "Exclude" option, which allows you to remove certain categories from the sample, will be used very rarely, compared to "Include", but this option is distracting and confusing. Also, filtering by date can be made more convenient if you focus the user's attention on typical filters (today or this month), and not distract attention with filters that are used less often (yesterday, previous month).

It is also a bad practice to overload with content - the given screen doesn't even fit on one page, because of which you have to scroll down until it ends.

As an example of the implementation of a user-friendly mobile application, the 1Money application [1] was studied. It was designed using all the basic design principles for mobile devices. The action «Add transaction» is available to the user in 2 or 3 clicks. Also, the screen uses standard elements and styling of the Android platform, which does not distract the user. Each screen is designed so that it solves one specific problem and contains a minimum of information that can benefit the user. For example, the invoice display screen is designed in such a way that all the information fits into half the size of the screen, due to which it looks simple and at the same time contains everything you need.

It should also be noted that none of the screens need to be scrolled to see all the content, which makes using the application very comfortable.

To identify the problem, several applications with similar functionality were installed and analyzed (in particular, 1Money and ZenMoney). As a result of the analysis, several problems were found that are inherent in a large number of applications, as well as specific shortcomings of specific applications.

The most widespread problem among applications for financial accounting is a user interface designed without taking into account the specifics of a particular platform.

Most applications use interface elements as similar as possible to the version for a personal computer. The problem of functional overload and misunderstanding of basic functions by the user is also very common. Trying to implement an application that is functionally similar to an application for a personal computer is the wrong goal because the user experience and the set of required functionality are different.

Also, in the studied applications, a problem was found when the application solves a very large number of problems, most of which the user will not need (and at the same time does not solve the most relevant problems), which leads to a deterioration of the user experience.

A significant role in the financial accounting application is played by the functionality related to the analysis of the received data and the formation of informative statistics. Most of the considered applications keep track of the categories in which transactions were made, but do not use this information in any way.

Thus, there is a need to create a software system for personal financial accounting, the components of which are mobile and server applications. Such a system will provide the user with the opportunity to register, after which he gets access to the main functionality of the system, namely:

- management of personal accounts;
- transaction management;
- management of transaction categories;
- management of plans for a certain time;
- automatic currency conversion;
- generation of reports and statistics.

Due to the fact that the main part of the system that will be used by the end user is a mobile application, the task is also to make the application as convenient as possible, intuitive and using all practices related to the development of quality mobile applications (use of Material Design Guidelines, adaptability of the user interface for different screen sizes, and others).

In order to implement all the logic, as well as add data storage, you need to implement the backend and deploy the database.

An important part of the functionality is the generation of informative reports and statistics that will give the end user the opportunity to understand what he spends his money on, warn him about exceeding the spending limit for certain categories, and also provide the opportunity to review changes in his finances over a certain period of time.

Also, the task that arises during the implementation of the server part and the deployment of the database is to ensure satisfactory indicators of fault tolerance and ease of scaling and monitoring, for which you should use cloud services for deployment. Containerization and container orchestration technologies should be used to ensure maximum portability of the system in any environment.

The developed software system should combine two parts: a client mobile application for smartphones running the Android OS and a server application that contains all the logic and is responsible for saving and interacting with data.

In order to meet the requirements of the end user, the mobile application must contain the following functionality:

- possibility to register;
- the possibility to log in to the system, if you have an account;
- adding a new account;
- viewing the status of all added accounts;
- adding a new category of transactions;
- review of all available categories;
- adding a transaction for a certain account;
- review of all transactions for the account;
- deletion of a specific transaction;
- the possibility of adjusting the amount on a certain account;
- determination of the spending plan for a certain period of time;
- review of expenditure plans and their compliance with actual expenditure;
- formation of a daily report on expenses over a period of time;
- formation of a report on the ratio of expenses to categories;
- display of statistics for the entire accounting period;
- automatic currency conversion;
- possibility to log out of the system.

In order to provide the necessary data for the correct operation of the client application, the server must implement the following functionality:

- storage of information about system users;
- storage of information about categories;
- storage of transaction information;
- storage of information about user accounts;
- storage of information about the user's financial plans;
- adding and deleting transactions;
- adding categories;
- adding accounts;
- the ability to change the account balance without a separate transaction;
- the possibility of creating a report on the distribution of costs by category;
- the possibility of generating a report on the distribution of expenses by day in a period of time;
- the possibility of generating a report on the compliance of expenses with the user's plans;
- formation of statistics for the entire period of financial accounting.

To deploy a server application, you must have the following software:

- any modern OS with virtualization support;
- Docker version 19.03 or higher;
- Kubernetes version 1.14 or higher.

Due to the fact that the server application is deployed using the Kubernetes container orchestration system, the hardware requirements remain quite high:

- 16 gigabytes of RAM or more;
- at least 25 gigabytes of free disk space;
- a quad-core processor or more.

To ensure maximum fault tolerance and optimization of system operation, the deployment should take place using cloud technologies and the Google Cloud Platform. Google Kubernetes Engine must be used as the cluster for the server application. To reduce the costs of maintaining and deploying the database, the Database as a Service (DaaS) approach should also be used - in particular, the MongoDB Atlas service.

## **CONCLUSIONS**

Despite the availability of a fairly large number of personal financial accounting applications, each of them currently has certain shortcomings that require improvement. One of these shortcomings is the use of outdated principles of user interface design, which is improved by adapting it using typical mobile application development practices and focusing on the functionality that the user primarily needs. This proves the prospects of developing an application that fully solves all the user's needs for keeping personal financial records, and does it in a form convenient for him, and the possibility of monetizing such an application on the global application market.

## **LITERATURE**

[1]. 1Money Expense Tracker Web URL:

<https://play.google.com/store/apps/details?id=org.pixelrush.moneyiq>