

# Theory of Development of Financial-Analytical Thinking

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## Abstract

Financial independence and the ability to manage own capital can rightfully be considered one of the most important aspects of a person's life. This is especially important in the context of the modern development of relations between people. Scientific and technological progress, marketing, and the development of social principles in social-economic relations develop in a person a stable system of views and interests. Which in turn generates a certain kind of demand for goods and services that no one could have previously thought of. An example of this could be buying clothes in a computer game for a favorite character, flying in a suit airplane, buying some item that can be thrown away by the same buyer a few minutes after the purchase. At the same time, there is no single theory about how to act and what to do in order to develop a kind of information immunity to this kind of information flow. How to develop financial-analytical thinking and learn to use it at the subconscious level. When a person seems to have made his choice without thinking. This article proposes a theory-method of teaching based on the work of financial institutions, which will allow to develop financial and analytical thinking that allows to make decisions that are most beneficial for a person from a financial point of view. First of all, this article will be useful to those who have plans to connect their lives with finance.

## Keywords

Education, Finance, Analytics, Fintech, Banking, Android Studio, Java

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## 1. Introduction

Modern development of technology gives a person the opportunity to develop more dynamically and find ways to earn money that for people of the last cen-

tury may seem unrealistic. A striking example of this is trading on the Internet, trading in an online game, etc. But the system of accounting for expenses/income remains unchanged. What changes is the way financial information is handled. These used to be huge registries, now they are huge databases taking up terabytes of data with multiple copies, but in the case of a registry, finding the information it need can take hours, and in the case of a database, it can sometimes take a few milliseconds or second in a bad case. Similarly, creating a report was not an easy task because it required a certain level of skill to find the necessary information to summarize, and if an error occurred, the process had to be repeated. And now, at worst, it's a matter of a few seconds. From an early age, every person is faced with relationships related to finances, going to the supermarket for groceries, or buying a favorite toy. Moreover, now almost everyone has a smartphone in their pocket, with which is possible play games and watch videos. In the same way, it is possible keep records of financial activities: every day, making purchases or receiving money, can keep a kind of record of own activities. At first glance, this may seem like a tedious task, but if it will became a habit and systematize it, then from a tedious task it will turn into an exciting process, which will subsequently take the first step instead of a person towards the goal of understanding finances and allowing to make financially correct decisions. It may not sound entirely believable or deceptive, but it is true: big achievements begin with small steps. And as practice shows, most of all a person succeeds in what he did in childhood. For example, if in childhood a child was interested in electronics and, most likely, the child did not make complex integrated circuits, but did it at some initial level, then in adulthood it will be much easier for him, as a student, to understand integrated circuits than for a student who has heard the word electronics, already at the university and when to ask a student "why can you do better?", very often hear in response something like it turns out by itself. But in fact, through systematic training, a certain vector of thinking is developed already at a subconscious level, and even if a person did something at a simpler level, it will be easier for him to move on to a more complex one, because he is already at some level. In the same way, a penchant for finance can be cultivated through systematic activities, which for a child may look like a game. Recording on a smartphone at first glance seems like a banal thing. But firstly, from childhood, a child develops an understanding that a financial transaction, even the smallest one, must be registered in the accounting system. And later, when the child grows up, he develops a habit on a subconscious level that will not allow him to forget to make an entry. Secondly, even after the most basic analysis, the child will begin to develop financial and analytical thinking. But in fairness, it must be said that at this stage it is necessary to help in every possible way in studying and understanding the information that will allow to analyze what these records mean and what their meaning is. To make it easier to understand the idea itself, a small program for a smartphone was developed that will allow a more structured presentation of the theory, what

is needed and why. The basis was taken from many years of time-tested experience in accounting in financial companies such as banks, leasing companies, and pawnshops. After all, the successful work of the above organizations, profitability and development vector directly depend on the correct maintenance of financial accounting and its analysis [1]. Also, one of the main reasons why the experience of these organizations was taken is that in the case of training, it is very important to form the correct vector of understanding of any discipline, because it is very difficult to relearn later. It is clear that it is impossible to present the entire essence of the activities of these organizations within the framework of this article, and this is not necessary. The main goal is to formulate a theory that will allow us to form such qualities as systematicity, analytical thinking and, on the basis of this, will allow us to make correct decisions, because the decision-making process cannot in any way be classified as a process that cannot be controlled. This is confirmed by systems that operate on the basis of neural networks, which in turn model the functioning of the human brain. And in order for a signal to pass from neuron to neuron, it needs to “jump” a certain threshold in the synapse. And in neural networks, these thresholds are set during the training process of the neural network, and the key word in this sentence is “set”, that is, it are made such that the network output produces a known expected result with a certain probability. Also this theory-method allows to arouse interest in studying entire branches of mathematics from an early age. And the child will not be bored in class, but on the contrary will strive to understand how to work with interest because child will need to understand this to analyze his financial activities. And words such as balance, debit, credit, profitability—these will be his daily entries in his smartphone.

## 2. Accounting

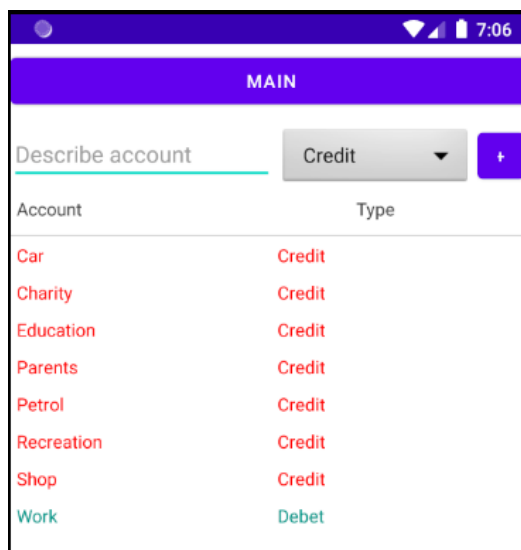
In this chapter, as mentioned earlier, the theory itself will be presented using the example of a specially developed program on Android Studio (JAVA) [2] for a smartphone. The basic version of the developed program has 3 sections that minimize accounting to a level that will allow to fully reveal the accounting theory itself and understand the basic meaning of what is needed and why. And in the future, this will give a person an understanding of how more complex and large-scale accounting systems works.

### 2.1. Accounts Page

This section, shown in **Figure 1**, presents the functionality for creating income and expense accounts, which are designated as Debet and Credit, respectively. Within the framework of this article, an income is the receipt of funds on the balance sheet, and an expense is the writing off of funds from the balance sheet. Also, when created, income and expense accounts are called the Debet or Credit type, so that a person from the beginning to understand the essence of financial terminology and the meaning of the terms. Also, for a more convenient under-

standing, color differentiation has been introduced for invoices, depending on whether the invoice is an expense account or a receipt account.

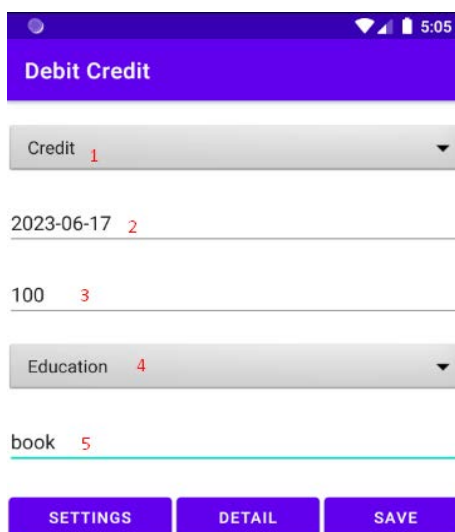
To create an account, specifying the account type is required. This creates an understanding that when accounting for funds, they can either be received or spent. And accordingly, when creating the next account, need to think about what to call this account and what type this account should be. In **Figure 1**, a list of arbitrary accounts with a specified type for each is also displayed. The “Car” account displays information about the money spent on maintaining the car, starting with its purchase, issuing an insurance policy, repairs, tire replacement, auto tuning—in other words, everything that concerns the car itself. The Petrol account displays information about the money spent on gasoline that fuels the car. Of course, these expenses can also be recorded in the “Car” account, but in this case this division was made specifically in order to form an understanding of the related accounts, that is, there is a “Petrol” account when there is a “Car” account. The “Shop” account includes all purchases made during the week when going to the grocery store, buying school equipment if a teenager will use the program, buying a book, etc. The “Recreation” account includes all expenses incurred for various types of entertainment. An example of this could be going to the cinema, buying a toy, buying tickets to a match of favorite basketball team, buying a brand new bat for playing baseball. Money spent on travel, etc. The “Education” account includes all expenses spent on education, courses, training, necessary books, etc. The Charity account records money spent on charity. “Parents” account records financial assistance to parents. “Work” account—displays the source of money entering the balance; as mentioned earlier, it is displayed in green because, unlike those listed earlier, it is a debit account. If there are several sources, it is quite reasonable and convenient to create several accounts that will reflect the amounts for each individual account.



**Figure 1.** The page for creating new credit’s or debit’s account.

## 2.2. Transaction Accounting Page

On this page, **Figure 2**, the actual accounting of financial transactions takes place, a kind of operational accounting of financial transactions. That is, a separate financial transaction is registered as of the date. When making a transaction, a person will already at this stage need to determine the type of financial transaction, and then select the account into which this financial transaction should be recorded. By default, the type is immediately defined as credit because for the most part expenses will be recorded and, to a lesser extent, income. The default date is set current in yyyy-mm-dd format. Next is the field for entering the amount expressed in monetary units, which is also not unimportant because the assessment of any product or service, within the framework of this article, is expressed in monetary terms and not in physical terms. This also forms the understanding that any product or service in the conditions of modern economic development can be expressed in monetary form. Next comes account item 4—the account to which the transaction should be recorded in the opinion of the person keeping the records. Next comes a field for entering brief information on the operation, as shown in the example; a description of the product itself is entered, 5—book. At first glance, it may seem that this is too primitive a thing, and there is no strict regulation of where this or that purchase should be attributed because the accounting system of bank has strict regulations indicating which transaction and to which account should be entered. But in this case there is another task, namely the formation of financial and analytical thinking in a person, and not training in accounting. And this does not require strict regulations. The main thing here is that each transaction is recorded and deposited into an account which, in the opinion of the person who keeps the records, is the most suitable for this operation, and accounting will need to be studied at the appropriate educational institution. Also, this method develops systematic and timely



The screenshot shows a mobile application interface for recording a transaction. The screen has a purple header with the text "Debit Credit". Below the header is a dropdown menu showing "Credit" with a red "1" next to it. The date "2023-06-17" is displayed with a red "2" next to it. The amount "100" is entered with a red "3" next to it. Another dropdown menu shows "Education" with a red "4" next to it. The description "book" is entered with a red "5" next to it. At the bottom are three buttons: "SETTINGS", "DETAIL", and "SAVE".

**Figure 2.** The work page for accounting new operation.

execution of certain actions, which is a very important quality when conducting any work, not necessarily financial, but in the case of finance this is especially important. For example, if an entry for a certain operation is missed, then the next day may no longer remember it and the consequence of this may be the loss of important financial information for some operation and in the case bank this will be minimum an penalty.

### 2.3. Analysis Page

The analysis page shown in **Figures 3-5** serves as a kind of tool that allows to display data in a synthetic accounting format and also in an analytical accounting format, for analysis and making appropriate decisions in the future. That is, already at this stage a person becomes familiar with such concepts as synthetic calculation, analytical calculation, which immediately sows the seed of interest in an inquisitive mind, what it is and how it works.

When the analysis page initially loads, only credit accounts are immediately displayed **Figure 3** (with type credit). This is done so that if the page is accidentally turned on, income will not be visible, and income can be displayed only after turning on the display of debit accounts. This was done for reasons of human psychology, because envy in a person is caused by the fact that someone earns more than himself. And this seemingly small detail is very important in running a business, because competitors should not know the real state of affairs, especially when it comes to income. Tick Gr. Acc. (synthetic) immediately shows in what format the data is displayed on the page, that is, in the format of a synthetic account, when the data is grouped for each account without detail. When adding an account type as shown in **Figure 4** the program begins to display data on incoming and outgoing accounts. In this case, the balance is calculated immediately. When unchecking Gr. Acc. (synthetic) the program begins to display data in the analytical account format as shown in **Figure 5**, in this case, the corresponding near the check box appears entry Gr. Acc. (analytical). Also, any change of filters or switching is applied only after pressing the “GO” key, to prevent accidental pressing.

Date	Account	Amount
Period	Education	150

**Figure 3.** Analysis page only credit's accounts and synthetic view.

Date	Account	Amount
Period	Work	3000
Period	Education	150

**Figure 4.** Analysis page credit's and debit's accounts and synthetic view.

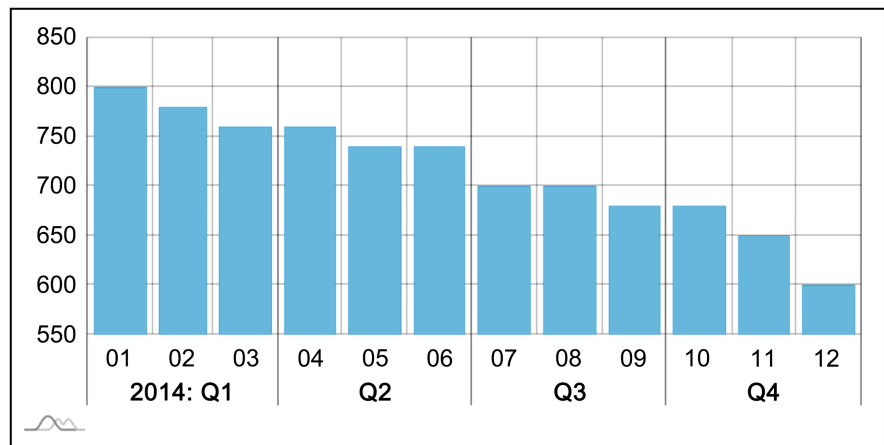
Date	Account	Amount
2023-08-18	Work	3000
2023-08-18	Education	100
2023-08-18	Education	50

**Figure 5.** Analysis page debit's and credit's accounts with analytical view.

### 3. Discussion

The developed theory allows to develop a certain level of financial and analytical thinking through systematic work on a person's own expenses and income. At the same time, it is very important that the program introduces terminology that is used when doing business by financial companies, but in this program it seems to be mentioned slightly, but this is more than enough to develop a person's interest in financial matters. Because the next stage is a detailed analysis, for example, the construction of diagrams as shown in **Figure 6**.

At this stage, a person will already need at least an understanding of such mathematical tools as percentages, relative value, absolute value of profitability or, on the contrary, loss ratio, because it will be necessary to make a comparison of how expenses have decreased or how income has increased, etc. When working with this type of reporting, an understanding of the relevance of the information



**Figure 6.** Graphing page for monthly expense analysis.

as of a certain date is formed, and what conclusions can be drawn if a certain type of financial information is available. And the question is whether an enterprise is profitable if it earned N thousand dollars in 2021, a person who is at least partially familiar with financial analysis will immediately generate an answer. It is necessary to at least compare these data with the previous year. Another not unimportant fact is that when working with this kind of programs, a self-arbitrarily need is formed to study disciplines that provide an understanding of what these terms mean, how to operate with them and how calculations are made. That is, there is no need to create motivation for learning, the person himself is motivated by his own interest, and in the learning process this is very important since very often have to explain to the child why he needs percentages and what he will calculate with them, and in the case of students it is sometimes difficult to explain why does he need mathematical analysis if he plans to work as a web developer.

#### 4. Conclusions

One of the main advantages of this theory is that it serves as an excellent motivational tool, especially for both schoolchildren and high school students, because the issue of financial independence is very attractive in itself. Also very important is the fact that when analyzing financial transactions one has to study sections of mathematics and economics, but this happens almost in a playful way, so to speak “invisibly” for a person. One of the main ones is that when analyzing expenses and income, financial-analytical thinking itself is developed as a result of systematic classes that take place on their own, without long lessons, which very often are not interesting, especially for a schoolchild. Which subsequently forms the habit of first thinking, calculating, and analyzing whether it is worth making a purchase of a product or toy. And in the hands of a teacher, this can become a kind of tool that allows to get interested in learning mathematics or the basics of economics, because by explaining percentages can give an example of how expenses on toys have changed since the beginning of the year, etc.



### **Conflicts of Interest**

The author declares no conflicts of interest regarding the publication of this paper.

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