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THE IMITATIONAL MODELING
OF RUSSIAN ACCOUNTING SYSTEM

Analysis of the trends of formation and development of analytical methods for management purpose, allows us to conclude that, their nature based on finance value and on the information of the accounting system (Emlyanov, 2010).

Historically, the accounting system was the main and only supplier of information about the company. However, over time, the number of users of this system has increased: the shareholders, government statistics, the tax authorities. So according to the requirements of different user groups, accounting acquired different attributes in the form of decrees, regulations, laws, etc. In turn, the increase in the number of users could not prevent reduction usefulness accounting system for management.

Thus, a number of case studies, for example, a survey conducted in 2007 on the basis of corporate Cheboksary Institute of Governors senior and middle managers about the usefulness of the information provided by the accounting system for management purposes, examined a number of problems of the accounting system, related to its orientation toward external users (government statistics, tax authorities) (Antonov, 2007).

Meanwhile, features of a modern economy, have had and continue to have an impact on accounting. However, all changes, are mainly related, to only the introduction of new information technologies that only automated the process of accounting, without affecting fundamental principles of accounting (Drucker, 2004).

In this case, the modern economy is characterized by increasing speed and volume of consumption and the growth rate of environmental change and grow increasingly information in it. In such circumstances, an important role begins to play the reaction rate of management, which in turn is based on the timeliness of providing information (Pichurin, 2001).

According to these, we would like to review the current information system of accounting of Russian enterprises, with the final position of the speed of providing information for management purposes.

To solve this problem we decided to build a simulation model based on the typical scheme of information flow of the Russian enterprise (Danilochkina, 2002). Apart from the scheme in article presented the quantitative data on the volume of primary documents passing through different parts of the accounting department. Based on these data, and taking into account the fact, that the data are given for a working month, we calculated the average values for each of the areas of accounting. The results are presented in Table. 1

When building a simulation model we have used the approach of Jay Forrester, widely spread in the U.S. – the so-called continuous approach to building simulation models of production and social facilities. Simulated object, regardless of the fact that observed in the nature of its operation, formalized in an abstract form of a continuous system, which circulates between the elements of continuous "flow" of a different nature (Forrester, 1971).

Table 1

The results of the calculation of the processing time of documents

Accountant	Processed primary documents	Total number of documents	The processing time of one document (min.)	The maximum number of documents processed per hour
Material Accountant 1	Waybills	380	28 min.	2
	Invoice			
Material Accountant 2	Credit slip for spare parts	430	25 min.	2
	Bills for spare-parts			
	Limit-cards			
	Requirements for the POL			
Material Accountant 3	Credit slip for spare parts	160	66 min.	1
	Bills for spare-parts			
	Invoice			
	Contarcts			
Cashier	Credit slip	245	43 min.	1
	Obligating documents, expense reports			
Payroll accountant	Payroll timesheet	630	17 min.	4
Total number of processed documents		1845		

In general, the circuit model can be described as follows. The incoming signal is represented as a unit of the "document" passes through one of the staff accounts. Accountant handles a document that is implemented in the form of a predetermined delay. Because the dimension of input signals, is an abstract unit of "document", then after processing the documents can be summed and then integrated into an automated accounting system or ERP system (such as 1C, SAP, etc.), which is quite likely at the current level of automation of accounting departments in modern Russian . The chief accountant and his assistant perform in our model, the control function, checking the correctness of input and display of primary documents. This function is similarly designed as a delay. The unit of model time is 1 business hour.

Formally, the model can be described as a system of equations (1)

$$\begin{cases} s_{in} - \int_1^n a_i \, dn + a_{in+1} \\ S_n - \sum s_{in} \end{cases} \tag{1}$$

Where

s_{ni} – the volume of documents for the accountant i at time n

$\int_1^n a_i \, dn$ – integrated volume of documents processed by the accountant i at time n

a_{in} – income of documents for accountant i at time n

t – the value of the delay in the processing of the document

S_n – the total number of documents processed in the accounting system at time n

For model experiment, the original scheme of information flows, has been somewhat simplified, but this simplifying, as will be shown below, not only does not contest the allegations, but on the contrary reinforces some of our arguments. The objective of the model is to hold a series of experiments that determine after what time from the begin-

ning of the month, management is able to figure out the financial results of the enterprise, and to take decision or to control and correct business process.

As shown in Table 1 an average processing time of a document is 30 min. That, in our view, it is realistic, because in addition to extra time for analysis and identification of the document, you need to take into account the time for its delivery, etc. The delay time for the functions of chief accountant and its deputy, was determined at 40 hours.

In the model of the entire volume of incoming source documents, initially accumulated, in a sort of stores that seem to be consistent within a stack of documents that are on the table by an accountant. From this unique store, documents received for processing, in the amount equal to the maximum volume of primary documents that the accountant can process per hour of working time (Table 1).

For this the number of documents was used delay-time, which corresponded to the time of document processing.

The model was implemented by means of a software package Matlab Simulink 7.3.0 (R2006b). Two experiments were conducted. They were differed from each other, by different rates of incoming documents.

In the first case, the documents received for processing in the form of an impulse at intervals of 8 hours and pulse duration of 1 hour. Figure 1 shows a graph of the signal for this type of experiment. Figure 2 shows a graph of the accumulation of documents in an automated accounting system. Figure 3 shows the schedule control function of the chief accountant. Extreme point of this chart indicates the time of receipt of information for further analysis.
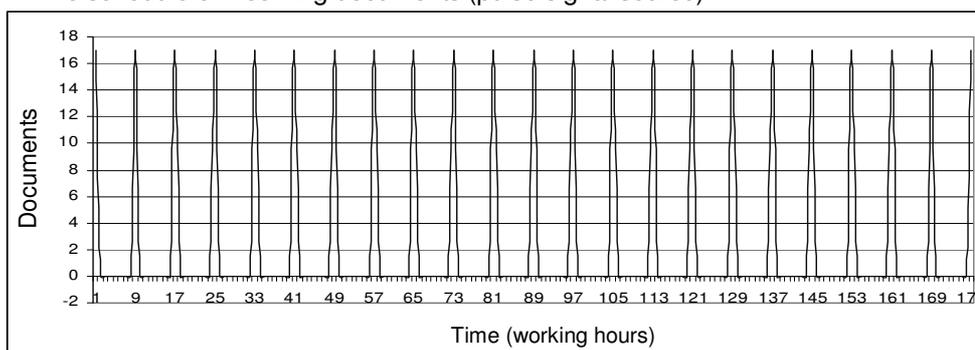
The schedule of incoming documents (pulse signal source)

Fig. 1

Schedule accumulation of documents in an automated accounting system (pulse signal source)
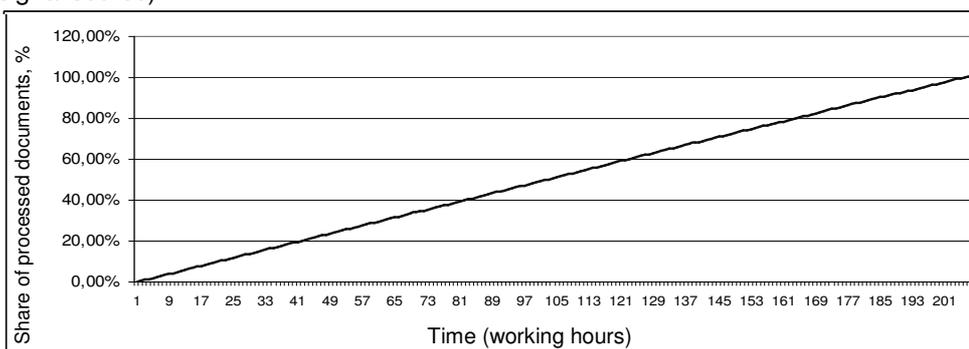

Fig. 2

The schedule of processing and verifying information as a chief accountant (pulse signal source)
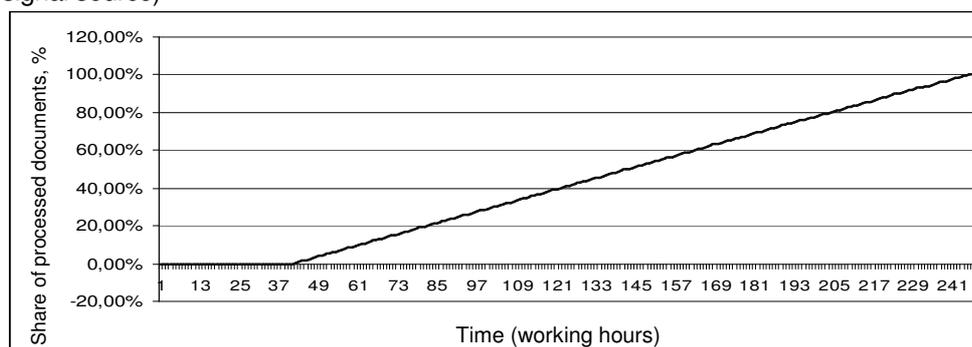

Fig. 3

As can be seen in the graph shown in Figure 2, all completely original documents of the reporting month, and processed 100% recorded in the computerized accounting system no earlier than 206 working hours, from the beginning of the month. In days, this corresponds to 25.75 weekdays. Given that the length of the working month, was adopted by us for 22 working days, an automated accounting system will contain all of the primary documents of the month at the beginning of the second week of next month, or more precisely at six o'clock in the third working day of the second week of next month.

After treatment of primary documentation, and entering it into an automated accounting system will execute control functions of the chief accountant and his deputy. Figure 4 is a graph of the implementation of the control function as a chief accountant, and his deputy. According to this chart fully the implementation of the control function will be held at the 246 hour model time. If you complete the transaction during the week, it will be 30.75. That is, plus another five days to the processing time of the primary documentation.

Thus, the term in which will be calculated the financial results and financial information will be prepared, is by the third day of the second week of the month following the reporting, or 246 hours.

This calculation was carried out under such conditions, when the incoming source documents, for processing received by accountants uniformly, that is strictly from the beginning of the month, at regular periods, in equal values. In actual practice, these conditions are difficult to be achieved, if at all possible.

Much more realistic picture is to provide the primary signal of incoming documents for processing in the form of increasing, at a certain rate.

Based on this, for the next experiment, we assume that the primary documents relating to the reporting month is beginning to attract the middle of the month (88 hour of model time) and arrive at an increasing rate over the 11 working days, that means, that the flow of raw data will expire at the end , the reference month. The volume of incoming documents in a given period increases with each working day.

Figure 4 shows a graph of the incoming signal for this type of experiment. Figure 5 shows a graph of the accumulation of treated primary information in the automated accounting system. Figure 6 shows the schedule control function of the chief accountant. Similarly to figure 3 an extreme point of this chart indicates the time of receipt of information for further analysis.

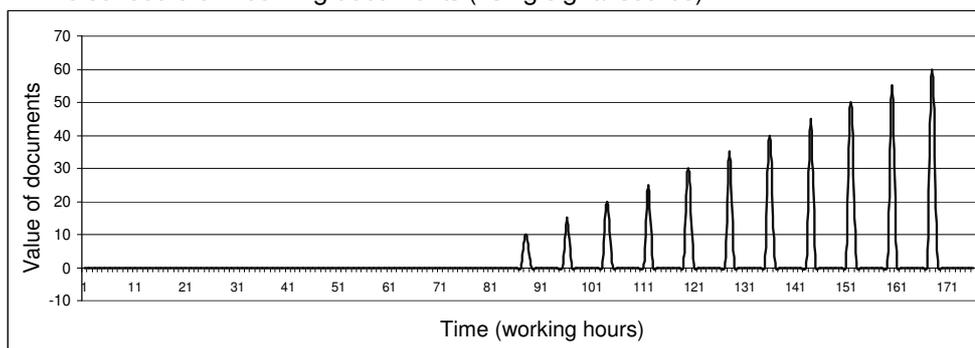The schedule of incoming documents (rising signal source)

Fig. 4

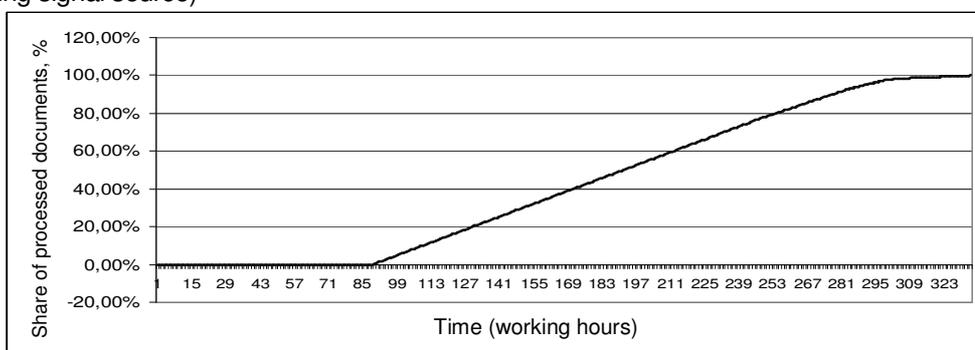Schedule accumulation of documents in an automated accounting system (increasing signal source)

Fig. 5

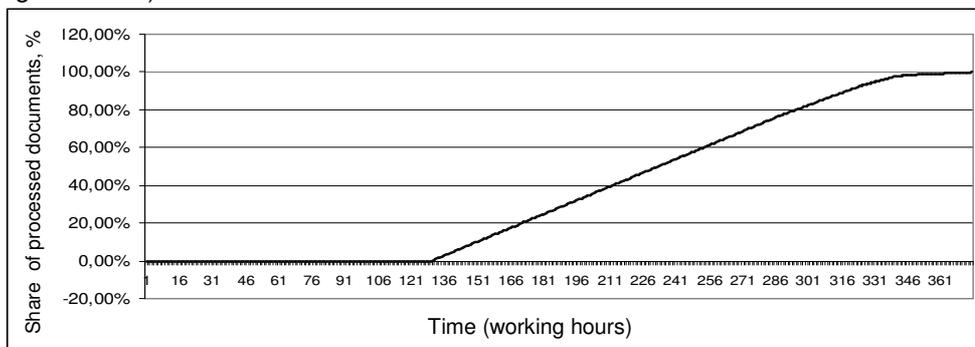The schedule of processing and verifying information as a chief accountant (rising signal source)

Fig. 6

The graph on Figure 5 shows that the full amount of all original documents will be processed and transferred to an automated accounting system for 334 hour from the beginning of the month or 41.75 working days. Given, that the length of the working month was adopted by us for 22 working days, all primary documents to be processed by 19.75 working days after the end of the month. Thus, processing of primary docu-

ments will be completed by the end of the fourth week of the month following the reporting period. Since the experimental conditions have not changed, then we need to take into account respectively control the function of chief accountant and his deputy. Figure 6 shows a graph of processing and verifying information as a chief accountant. According to the schedule in Figure 6, the execution control function completed by 374 working hour. What will be 46.75 day, or over 1.125 of the month following the reporting period.

The results obtained in the simulation of the accounting system, allows us, in our opinion, to indicate a low level of its efficiency. At the same time taking into account additional aspects of the economy, such as growth rate of the variability of the environment, we can justifiably say that the degree of immediacy of information provided by the accounting system in Russia is reducing, and will decline further.

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