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Improving accounting and analytical support for monitoring settlements with contractors based on IT technologies

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***Abstract* — The article discusses the possibilities of using IT technologies to increase the efficiency of monitoring settlements on receivables and payables of a commercial organization. As the object of study, the activities of management companies in the field of housing and communal services were selected. Such organizations have one of the most complex systems of relations with counterparties, including legal entities and individuals, state and municipal authorities, affecting not only economic but also social aspects, which is especially important in connection with the reform of housing and communal services in Russia**

The main problem arising from the multivariance of business-contractual relations between management companies and counterparties is associated with an imbalance of receivables and payables arising from this, which negatively affect the financial condition of organizations.

The authors investigated the causes of the above problems and developed possible directions for optimizing the existing monitoring systems for settlements of management companies with suppliers and consumers of services. The main promising areas are the transition to the experience of IFRS in assessing debts in the part that does not contradict the legislation of the Russian Federation, as well as increasing the effectiveness of monitoring by expanding the capabilities of software and strengthening the analytical aspects of processing information from internal and external sources.

The proposed recommendations for the modernization of accounting and analytical support for monitoring the settlements of management companies based on IT technologies can also be used by other commercial organizations with adaptation to the conditions of their business processes. The advantage of expanding the functionality of the software is to reduce the costs associated with the analysis of counterparties and work with overdue receivables, as well as reducing the time for making decisions on the organization of cash flows in an optimal balance of debts and obligations.

Keywords — accounts receivable, accounts payable, liabilities, counterparties, monitoring of settlements, management company, financial stability.

I. INTRODUCTION

Currently, there are trends to improve the quality characteristics of business processes due to the introduction of information technology. The increase in productivity of individual stages of production and management is achieved by reducing transaction costs, as a result of which the resulting indicators, both temporary and material, increase.

The transition of the Russian economy to the digital one has revealed in industrial enterprises the need for an objective assessment of the financial condition, solvency and reliability of their counterparties. Providing economic entities with full economic independence in the selection of sales markets for products, suppliers and contractors, and the search for sources of financing makes it necessary to pay special attention to settlements with counterparties using more modern technical means of processing and analyzing information.

Maintaining at an acceptable level of financial stability of the organization depends on the timely receipt of funds from customers and the possibility of a safe deferral of payments for its short-term obligations. Therefore, the digitalization of accounting and analytical support for monitoring calculations allows you to determine the economically feasible level of financial stability of the enterprise. This circumstance has a significant impact on the competitiveness indicators of enterprises.

The theoretical and practical problems of settlements with debtors and creditors discuss the works of scientists J. K. Van Horn (1997), Ju. Brigham (1998), M.E. Rafuse (1996), G. Meric (2019), V.V. Rokotyanskaya et al. (2018), E.S. Hendricksen (1997) and others.

Digitalization of accounting and analytical support for monitoring settlements with contractors: R.A. Alborov et al. (2010), L.A. Chaykovskaya (2015), G.A. Khabirov et al. (2018), O.V. Kotlyachkov (2014) and others.

The digitalization of accounting and analytical support was proposed by B. Birkhofer (2000), C. Lord (2000), B. Raghunathan And T. Raghunathan (1991), M. Rask (2009), H. Salmela (2002) and others.

B. Biais (2012), A. Bernstein et al. (2013), B. Mcsherry (2013) and others were involved in monitoring settlements with counterparties.

A review of scientific work allowed us to summarize the accumulated experience, the features of accounting and analytical support for settlements with contractors in the work of enterprises in the digital economy, and note at the moment the insufficiency of research on such issues, as well as the need to develop methodological approaches to digitalizing the monitoring of these calculations.

II. The Research Method

To maintain sustainable functioning, business continuity and the ability to quickly respond to ongoing market processes, organizations need to competently and rationally organize financial resources and plan cash flows. In this regard, there is a need for accounting for settlements with debtors and creditors, not only in analytics for each of the counterparties, but also in interlinking data on different types of debts to control compliance with the financial balance.

The amount of these debts, the timing, and the condition of them significantly affect the financial stability of enterprises. If the receivables are exceeded, an unfavorable situation arises with the financial situation of the enterprise and the risk of suspension of its activities. If accounts payable are exceeded, when the company is unable to pay its debts, there is a danger of penalties or bankruptcy.

The settlement monitoring system is an ordered system of interacting, interrelated elements that allow you to create accounting and analytical support for the enterprise's business processes by collecting, registering, summarizing, analyzing information and implementing control actions in order to assess the risks of its material distortion.

Accounts receivable and payable are key debt obligations in a partnership. Timely and proper organization of accounting and settlement control is the basis of the effectiveness of companies, therefore, during the study, a comparative analysis of the requirements of international financial reporting standards and Russian accounting standards was carried out. This made it possible to bring out the prospects of using international practice for the purpose of improving the formation of an analytical base for monitoring settlements with debtors and creditors.

Table 1 shows a comparison of Russian accounting standards (RAS) and international financial reporting standards (IFRS) to identify areas for improving monitoring of accounting and analytical support based on its digitalization.

Thus, despite the different methods for assessing and classifying types of receivables according to Russian and international standards, the main problems in both cases are problems of control over repayment and prevention of overdue debts.

To better manage this process, reserves are created for doubtful debts. In Russian accounting, there is an obligation to create reserves in both accounting and tax accounting. Doubtful debt is any overdue debt based on the inventory of receivables as of the last day of the reporting period. The amount of the reserve is formed independently by the organization's management for the calendar year. In this case, the following conditions must be met: the debt arose in connection with the sale of goods, works or services, is not secured by bank guarantees, pledges or sureties, repayment terms are established by the contract.

For tax accounting purposes, the amount of the reserve includes the full amount of debt with a term of occurrence of more than 90 days, 50% of the amount with a period of 45 to 90 days, and with a period of less than 45 days, the creation of a reserve is not provided. In addition, the amount of the reserve cannot exceed the largest of the two values - 10% of revenue for the reporting period or 10% of revenue for the previous year.

Accounts receivable are shown in the balance sheet minus the amount of the provision.

One of the main problems of many organizations is the imbalance of receivables and payables, which does not allow timely fulfillment of their obligations. Such measures are taken to eliminate it, such as toughening methods for collecting receivables, introducing a flexible payment system, creating reserves for doubtful debts and registers of dishonest payers, which also requires the automation of analytical processes and the expansion of information databases.

TABLE I. COMPARATIVE CHARACTERISTICS OF ACCOUNTS RECEIVABLE

Criteria	IFRS	RAS
General concept	It is allocated to the class of financial assets and is defined as "non-derivative financial assets with fixed or determinable payments that are not quoted in an active market"	It is regulated by the provisions of the Accounting Regulations, which disclose the recognition of income and expenses. The definition is given indirectly as an object arising in the case of temporarily unrecognized income of the reporting period.
Classification Features	By economic content, by the timing of occurrence or write-off, by the degree of security of debt obligations	
Assessment Methods	Fair value (for short-term or initial measurement of debt), amortized cost (for long-term debt calculated using the effective interest rate).	Income method, Cost method, Comparable sales method
	Income method, Cost method, Comparable sales method	Documentary confirmation is required in the form of reconciliation acts with the counterparty to ensure the reliability of accounting data for all parties to the contract.
Inventory	Identification of overdue debts for dealing with bad debts, selective or continuous method. There are no strictly regulated IFRS guidance on the procedure.	The reserve is determined and evaluated based on the results of the inventory for the planning of possible losses. Limit write-downs for tax purposes

The digitalization of accounting and analytical support allows you to implement a clear policy in relation to customers in terms of their debt to the company. The monitoring result is a reduction in the average statute of limitations for receivables, which entails an acceleration of the flow of funds to the enterprise and an acceleration of the investment cycle. The economic effect of digitalization of accounting and analytical support for monitoring settlements with counterparties is manifested in the fact that accounts receivable can be returned in a shorter time and invested in activities to extract subsequent income. The economic effect in the field of receivables management (P) is calculated as the difference between the receivables limitation period (Z) and the justified receivables repayment period (O) divided by the duration of the working capital turnover cycle (D) and everything multiplied by the amount of receivables with n-limitation period (S_n). Quantitatively, it can be calculated with the formula:

$$\sum_n ((Z - O) / D) * S_n = P \qquad (1)$$

For the timely identification and elimination of problems on the repayment of debts of the organization, it is necessary to increase the efficiency of analytical work by checking the balance of receivables and payables. For these purposes, a software change is also required as shown in Table 2. In order to quickly respond to changes in this balance sheet, the analysis should be carried out at least once a month.

III. RESULTS

Let us consider in more detail the problems of monitoring debts using the example of an organization operating in the field of housing and communal services. Administration company is a legal entity created for the management and operation, technical and sanitary maintenance of the housing stock. It provides two types of services: housing services that ensure the proper operation of the housing stock (payment is calculated on the basis of servicing 1 square meter of area), and utilities that administration companies provide to the population and legal entities based on established consumption standards, or according to individual metering devices. Payment for such services is set at tariffs approved by municipal authorities in each constituent entity of the Russian Federation.

Counterparties operating in the field of housing and communal services are represented by the following business entities: state (municipal) bodies regulating housing and communal services tariffs; resource supplying organization; repair (construction) organizations; consumers of housing and communal services.

In the housing sector, suppliers and contractors are mainly resource-supplying (electricity, water, gas) and transport (garbage disposal and waste disposal) companies, as well as construction and repair organizations.

$$\alpha + \beta = \chi. \qquad (1) \qquad (1)$$

TABLE II. PROPOSED DIRECTIONS FOR IMPROVING MONITORING OF SETTLEMENTS OF MANAGEMENT COMPANIES WITH COUNTERPARTIES USING DIGITALIZATION TOOLS

Types of operations with counterparties	Debt monitoring areas	Digital Opportunities
Control over the structure and dynamics of receivables	Improving the quality of analytical information on counterparty debtors in the context of: — maturity and recovery dates; — legal entities and individuals; — secured and unsecured obligations; — by sources of compensation payments and subsidies	Additional configurations and modules of subaccounts 2 and 3 of the order in the working chart of accounts of accounting software products
Provisions for bad debts	Formation of reserves according to the methodology of Russian standards and the tax code using the experience of IFRS in their assessment taking into account discounting	Extension of the functionality of directories downloaded from the Internet in software products
Debtor-Counterparty Analysis	Comprehensive analysis of the counterparty using external and internal information sources. Improving contract policy	Specialized software that makes it possible to calculate the final credit rating of each debtor by determining the sum of weighted assessments of all risk factors, determine the credit limit of each debtor based on the total debt limit, or based on the average monthly income from this debtor, and also calculate the discount amount, provided to the debtor for timely payment or the amount of the fine for violation of payment discipline
Acceleration of payments from individuals	Improving relations with cash settlement centers due to the redistribution of functions between them and management companies for timely receipt of payments	Expansion of payment options through stationary cash desks, the official website of the settlement center, through mobile applications. Move from paper to electronic receipts.
Debt inventory	Empowerment and acceleration of the traditional procedure for reconciliation of settlements using acts of reconciliation with legal entities in paper form	Transition to reconciliation acts confirmed by electronic signature, as well as discounting debts from external Internet resources
Introduction of new types of services (“garbage reform”)	Strengthening the control functions of regional operators for waste collection and disposal	Using the GLONASS system for a fleet carrying out garbage collection, using the media to explain to the population the need for separate waste collection.

The procedure for settlements of the administration company with resource-supplying organizations after receiving meter readings from consumers provided by law is carried out in the following sequence: administration company, resource, consumer, payment for the resource.

This whole process takes place in a constant turn and the sequence of its implementation does not change.

Consumers of services are the population and legal entities that are property owners. Consumers make payments on a contractual basis, but subject to state regulation of tariffs for a number of works and services.

Based on statistics for the last 10 years, the country as a whole has seen a constant increase in receivables for services of management companies by 12–16% compared to the previous year. A significant share of this debt is past due.

Settlements are made in cash and non-cash, as well as in the form of government subsidies and compensation payments for privileged categories of the population, since the sphere of housing and communal services is socially significant. Subsidies are calculated on the basis of regional standards for the cost of utilities, the standard area of a dwelling, and the allowable share of citizens' expenses on housing and utilities in the total family income.

Since the payment of bills by consumers is carried out after a month of actual provision of services, the receivables are formed mainly in the calculations. In addition, state subsidies from the budget are not received by the administration company, but by an individual who is entitled to benefits as compensation in subsequent periods. Therefore, an individual must first fully pay the bill to the administration company, and then receive compensation. This settlement procedure also increases receivables and slows down its turnover.

Another factor in the growth of receivables is the seasonal nature of the provision of utilities, when in winter the amount for heating, electricity and hot water increases significantly, and some consumers cannot pay on time.

As a rule, administration companies delegate the obligation to conduct settlements with consumers of services to a single cash settlement centers. The single settlement and cash center is a specialized organization that conducts calculations of the total amount of utility bills for the population and represents it as a single receipt.

The functions of the single cash settlement centers include:

- Creation of a single database of consumers, suppliers, tariffs, services.
- Processing data of metering devices.
- Accruals and recalculations.
- Billing.
- Collection of payments.
- Dispatching and distribution of payments.
- Reporting to utility providers.

The use of cash settlement centers as an intermediary in settlements brings undoubted convenience to the population

but creates certain problems for management companies associated with a slowdown in the process of paying off receivables from consumers and an increase in accounts payable for the services of these centers.

As another problem affecting the activity of enterprises of housing and communal services, it is necessary to indicate the beginning of the meeting in January 2019 on the territory of the Russian Federation, the so-called "garbage reform." Its purpose is the elimination of illegal landfills and the transition to the separate collection of waste, their sorting and recycling.

To implement the reform, regional waste management operators are being created, whose tasks include collecting, transporting, processing, disposing, rendering harmless and disposing of waste. That is, the functions of regional operators are similar to those of administration companies in terms of multivariance of settlement operations. On the one hand, they will have permanent receivables from legal entities and individuals for the collection and disposal of garbage. On the other hand, there are obligations to transport service providers regarding the maintenance of landfills, sorting, and processing of waste. As the activity of such an operator extends to the entire region, coordination of significant information resources for monitoring calculations and special software and hardware will be required.

Thus, based on the identified problems in the organization of accounting and analytical support for settlements with contractors using the example of the housing and communal services industry, the following conclusions can be drawn.

To increase the effectiveness of control and analytical operations, it is necessary to use a combination of interconnected, technically-supported algorithms that are an integral part of an integrated enterprise management system. The proposed areas are presented in Table 2.

The economic effect of improving the accounting and analytical support for monitoring settlements with counterparties based on IT technologies in the enterprise in question is expressed in the fact that the average statute of limitations for receivables is reduced, and the funds released in this way can be invested in the activities of the enterprise.

Monitoring settlements with counterparties based on IT technologies allows to implement a clear policy in relation to customers in terms of their debts to the enterprise. The result of using IT technologies is a reduction in the average statute of limitations for receivables, which entails an acceleration of the flow of funds to the enterprise and an acceleration of the investment cycle. Thus, the effect of improving the accounting and analytical support for monitoring settlements with counterparties based on IT technologies is manifested in the fact that receivables can be returned in a shorter time and invested in activities to generate subsequent revenues. The quantitative effect can be estimated with the formula (1).

To calculate the economic effect of improving the accounting and analytical support for monitoring settlements with contractors based on IT technologies, we group the receivables that arose during the year at the enterprise, according to the limitation period of its occurrence.

The justified repayment period for receivables in modern conditions is 3 months. Analysis of receivables from these positions showed that the nature of the distribution of debt by statute of limitations is practically independent of the base period of the statute of limitations, and can be presented in the averaged form in Table 3.

The release of working capital associated with the optimization of accounting for receivables is 72.9 million rubles per month. The economic effect in this area is expressed in the annual release of working capital of the enterprise in the amount of 874 million rubles.

TABLE III. CALCULATION OF ECONOMIC EFFECT

Period of occurrence	Accounts receivable (thousand, RUB)	The limitation period for receivables (months)	Loss of implementation (thousand, RUB)
December	347,576	1	0
November	100,541	2	0
October	21,244	3	0
September	7,182	4	2,700
August	30,693	5	23,077
July	4,596	6	5,183
June	6,397	7	9,619
May	2,447	8	4,600
April	2,837	9	6,399
March	2,779	10	7,315
February	2,851	11	8,575
January	1,608	12	5,441

The proposals presented are designed for the work of management companies, but can be adapted for other types of activities, adjusted for the features of their functioning.

Table 4 shows sample articles of analytical accounting, according to which it is recommended to monitor the balance of receivables and payables in management companies.

TABLE IV. NOMENCLATURE OF ARTICLES FOR ANALYSIS OF THE BALANCE OF RECEIVABLES AND PAYABLES OF THE MANAGEMENT COMPANY

Accounts receivable	**Accounts payable**
1. Short-term, including:	**1. Short-term, including:**
arrears in payments for provided utility services, including: legal entities; individuals	debt to resource companies and third-party utilities complex organizations
debt for the operation of the housing stock, including: legal entities; individuals	debt to suppliers of materials; arrears of wages of workers engaged in the operation of the housing stock and contributions to social funds; debt to third parties
debt of legal entities and individuals for the removal and disposal of household waste	debt to organizations involved in the removal, recycling and recycling
	other debts of the management company for general expenses to the budget
2. Long-term — according to similar analytics	**2. Long-term — according to similar analytics**
Total	**Total**
Passive balance	**Active balance**
Balance	**Balance**

This analytics will help to identify the relationship between the payment of certain types of services provided to the population and organizations and the repayment of debts to suppliers of these services, which are third-party organizations in relation to the housing and communal services company, or to the divisions of the management company itself of the requirements of the Digital Economy Development Program in the Russian Federation.

IV. CONCLUSION

The main advantage of the areas of automation of accounting processes proposed by the results of the study is the ability to more quickly collect and analyze data, process information flows, and, therefore, improve the quality of business processes, which is expressed in the following:

- Automatically promptly update data on the status of receivables and receipt of payments from debtors of individuals and legal entities;
- Take into account the significant conditions of the contracts for the provision of services (the period of deferred payment, the moment of recognition of the occurrence of receivables, etc.);
- Automatically generate a report on the aging of receivables to control the timing of obligations by debtors;
- Automatically block the service if the period of delay in fulfilling obligations for the previous service has exceeded the permissible values;
- Decrease in a human factor at the analysis of clients;
- Reducing the risk of overdue receivables;
- Strengthening control over work to reduce existing receivables and develop flexible contractual policies for existing and potential buyers;
- Constant updating of data on the balance of receivables and payables, which allows rational planning of cash flows.

Thus, well-thought-out areas of digitalization of accounting and analytical support for monitoring settlements with contractors contribute to the release of a significant part of the funds invested in receivables, increase the financial results of the organization, improve its financial condition and increase competitiveness.

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