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**ANALYSIS OF EFFICIENCY OF USE OF ORGANIZATION'S
FIXED ASSETS USING MACRO PROGRAMMING ELEMENTS
(EVIDENCE FROM VITEBSK CARPETS COMPANY)**

**АНАЛИЗ ЭФФЕКТИВНОСТИ ИСПОЛЬЗОВАНИЯ ОСНОВНЫХ
СРЕДСТВ ОРГАНИЗАЦИИ С ПРИМЕНЕНИЕМ ЭЛЕМЕНТОВ
МАКРОПРОГРАММИРОВАНИЯ (НА ПРИМЕРЕ
ОАО «ВИТЕБСКИЕ КОВРЫ»)**

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ABSTRACT

FIXED ASSETS OF THE ORGANIZATION, ANALYSIS OF FIXED ASSETS, CALCULATION OF INDICATORS OF THE EFFICIENCY OF USING FIXED ASSETS, SOFTWARE APPLICATION

The article examines the efficiency of using fixed assets of Vitebsk Carpets Company for the period 2016–2017. To automate the calculation of performance indicators, a universal software application has been developed based on the MS Excel spreadsheet processor.

АННОТАЦИЯ

ОСНОВНЫЕ СРЕДСТВА ОРГАНИЗАЦИИ, АНАЛИЗ ОСНОВНЫХ СРЕДСТВ, РАСЧЕТ ПОКАЗАТЕЛЕЙ ЭФФЕКТИВНОСТИ ИСПОЛЬЗОВАНИЯ ОСНОВНЫХ СРЕДСТВ, ПРОГРАММНОЕ ПРИЛОЖЕНИЕ

В статье исследуется эффективность использования основных средств ОАО «Витебские ковры» за период 2016–2017 года. Для автоматизации расчетов показателей эффективности разработано универсальное программное приложение на базе табличного процессора MS Excel.

Any enterprise seeks to increase the volume of production and sales of products. To do this, it is necessary to know whether the company has enough fixed assets and what is their technical condition. Having an idea of the structure of fixed assets, their physical deterioration and factors affecting them, it is

possible to predict problems that can lead to a decrease in the efficiency of using fixed assets and production facilities of the enterprise.

For a general assessment of the movement and technical condition of fixed assets, a number of indicators are used that reflect the intensity of the processes of receipt and disposal of fixed assets: coefficient of receipt (input), coefficient of renewal, coefficient of disposal, coefficient of liquidation and coefficient of growth of fixed assets.

The purpose of the study is to analyze the effectiveness of using the organization's fixed assets and create a universal software application that automates the calculation of key indicators for such an analysis. The object of the research is the fixed assets of Vitebsk Carpets Company.

The information base of the research is presented by the data of accounting and statistical reporting of Vitebsk Carpets Company for 2016–2017. Research tools are MS Excel spreadsheet processor, macro programming technology.

In accordance with the adopted methodology for calculating the efficiency of using the organization's fixed assets [1], an algorithm is proposed that includes the following stages:

1. The choice of indicators, i.e., the data of accounting and statistical reporting for the base and reporting period, on the basis of which the criteria for the effectiveness of the use of fixed assets of the organization are calculated.
2. Calculation of the average annual cost of fixed assets and its growth rates.
3. Calculation of indicators of movement of fixed assets and their absolute deviations.
4. Calculation of indicators of the technical condition of fixed assets.
5. Calculation of indicators of efficiency of use and growth rates of fixed assets (capital productivity, capital intensity, capital-labor ratio, profitability).

Calculation of the dynamics of these indicators is a routine and time-consuming process, even with the use of information technology. Therefore, it is more convenient to use information products to implement the formulated algorithm. For these purposes, they often use the capabilities of the MS Excel spreadsheet processor, programming languages C, C++, C #, or web programming technologies. Despite the apparent advantages of the C, C++, C # languages, particularly their support for various styles and programming technologies and cross-platform, these languages have drawbacks, and the main one is the difficulty of learning them. Therefore, the MS Excel spreadsheet processor was used as a toolkit, which has a friendly interface and provides a wide range of built-in functions [2]. To select the direction of analysis, a software application was developed, the main button form of which is shown in Figure 1.



Figure 1 – Main page of the software application

Compiled by the authors.

The calculation of each group of indicators is made on separate sheets of the MS Excel, navigation between them is carried out using control tools (buttons) and hyperlinks). To automate calculations, formulas and built-in functions of various categories of MS Excel are used, as well as procedures and functions are written and written in the Visual Basic for Applications (VBA) programming language. Macros are written to activate calculations [3].

As an example of the calculation technology, the analysis of the movement, receipt and disposal of fixed assets, carried out according to the template table on the worksheet of the developed product (see Fig. 2), is given.

Compiled by the authors.

Based on the results of the analysis of the movement of fixed assets, it was found that in 2017 compared to 2016, the rate of receipt of fixed assets decreased by 0.058 percentage points. [4]. The greatest decrease in this indicator (by 0.118 percentage points) is observed in the group of machinery and equipment, which indicates a decrease in the share of equipment being commissioned and an increase in the wear of fixed assets. At the same time, the retirement ratio increased by 0.001 percentage points, which is associated with an increase in the number of written off and liquidated fixed assets, the renewal ratio increased by 0.001 percentage points, the growth rate decreased by 0.06 percentage points.

In a similar way, the analysis of the depreciation of fixed assets was carried out, which showed that in 2017, compared to 2016, the shelf life ratio decreased by 0.05. The largest decrease in the coefficient is observed for vehicles (by 0.10),

machinery and equipment (by 0.08), tools, inventory, and accessories (by 0.05). At the same time, structures have the highest degree of wear (0.78), which is due to the insufficient volume of commissioned assets and the low degree of write-off of obsolete fixed assets. Analyzing the coefficients of shelf life and wear, it was found that the degree of wear of fixed assets was 0.55 in 2016 and 0.60 in 2017.

Основные средства	Коэффициент поступления			Коэффициент выбытия			Коэффициент обновления			Коэффициент ликвидации			Коэффициент прироста		
	2016 г.	2017 г.	Изменение	2016 г.	2017 г.	Изменение	2016 г.	2017 г.	Изменение	2016 г.	2017 г.	Изменение	2016 г.	2017 г.	Изменение
Всего основных средств	0,168	0,109	-0,058	0,003	0,004	0,001	0,004	0,005	0,001	0,001	0,001	0,000	0,165	0,106	-0,059
Здания	0,044	0,098	0,053	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,044	0,098	0,053
Сооружения	0,026	0,056	0,030	0,000	0,000	0,000	0,004	0,002	-0,003	0,000	0,000	0,000	0,026	0,056	0,030
Передаточные устройства	0,061	0,091	0,029	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,061	0,091	0,029
Машины и оборудование	0,236	0,118	-0,118	0,004	0,006	0,001	0,006	0,008	0,002	0,002	0,002	0,000	0,233	0,113	-0,120
Транспортные средства	0,077	0,065	-0,012	0,005	0,001	-0,004	0,000	0,001	0,001	0,005	0,001	-0,004	0,072	0,064	-0,008
Инструмент, инвентарь и принадлежности	0,087	0,104	0,017	0,016	0,018	0,003	0,018	0,006	-0,013	0,016	0,018	0,003	0,072	0,087	0,015
Другие виды основных средств	0,069	0,121	0,052	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,069	0,121	0,052

Figure 2 – Analysis of the movement of fixed assets of Vitebsk Carpets Company

The analysis of the calculated indicators of the efficiency of using fixed assets of Vitebsk Carpets Company, carried out on a separate sheet of the workbook, allows us to conclude that in 2017, compared to 2016, the capital intensity of fixed assets decreased by 0.01 rubles, the indicators of capital productivity and profitability, on the contrary, increased by 0.02 rubles. and 2.39 p.p. accordingly, which speaks of more rational use of fixed assets [5].

The developed software application has a friendly interface and does not require any special programming skills.

The application is universal, since it allows, on the basis of accounting, statistical and operational accounting materials, to form the necessary initial data, and then to analyze the availability, movement, condition and use of fixed assets of enterprises and organizations of any form of ownership.

References

1. Шутенко, А. А. Анализ эффективности использования основных средств / А. А. Шутенко // Научный журнал «Вектор экономики». – 2017. – № 12(18). – С. 15.
2. Волчёнков, Н. Г. Основы программирования на языке Visual Basic для офисных приложений: учебное пособие [Электронный ресурс]. – Москва : НИЯУ МИФИ, 2018. – 166 с.
3. Вардомацкая, Е. Ю. Интерактивное приложение для автоматизации калькуляции себестоимости / Е. Ю. Вардомацкая // Сборник научных статей МНПК «Социально-экономическое развитие организаций и регионов Беларуси: эффективность и инновации» / УО «ВГТУ». – Витебск, 2018. – С. 51–55.
4. Соломатин, А. Н. Экономика, анализ и планирование на предприятии торговли : учебник для вузов / А. Н. Соломатин. – Санкт-Петербург : Питер, 2009. – 560 с.
5. Саруханян, А. А. Теоретические основы анализа основных средств организации / А. А. Саруханян // Аллея науки. – 2018. – № 2(18). – С. 361–364.