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Selection of a method for market segmentation in the field of transport and logistics services

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Abstract: The paper discusses approaches to segmenting the client base in the field of transport, logistics, and freight forwarding services. Particular attention is paid to the application of ABC and XYZ analysis methods as tools that make it possible to classify clients according to their impact on financial results and the stability of demand for services. It is shown that the use of a combined ABC/XYZ matrix makes it possible to improve management efficiency, optimize resource allocation, and develop a differentiated approach to customer service. The possibility of applying a flexible management system based on data analysis, profitability monitoring, and consideration of the specifics of interaction with counterparties is examined. It is concluded that the proposed methods should be tested using real information databases of transport and logistics companies in order to confirm their effectiveness.

Keywords: market segmentation, transport and logistics services, ABC analysis, XYZ analysis, ABC/XYZ matrix, client base, logistics, inventory management, financial results, operational management, freight forwarding companies

1. Introduction

The strategic and commercial objective is to maintain and develop commodity exchange relations. However, for the effective organization of operational activities, as well as for the proper assignment of tasks to individual departments and employees, it is necessary to segment the customer base. Taking into account the specific needs of clients leads to a high level of personalization of the services provided. In this regard, it becomes difficult to standardize the range of services and to form unified service packages. For this reason, carrying out a clear classification of clients in the field of transport and freight forwarding services presents a certain difficulty.

2. Research methodology

For planning commercial activities, it is necessary to choose a method that makes it possible to operate with a diverse range of items. To practically solve inventory management problems in logistics, the ABC modeling method is used. Deterministic models for determining the economically optimal order quantity (EOQ), as well as probabilistic models of safety stock, are difficult to apply in systems that include thousands of inventory items. In addition, such models cannot take into account the specific features of delivery technology when different modes of transport are used. The ABC method shows that a small percentage of inventory items accounts for the largest share of sales, while the majority of product items represent only a very small portion of total sales. A typical scheme of this method is shown in Fig 1.

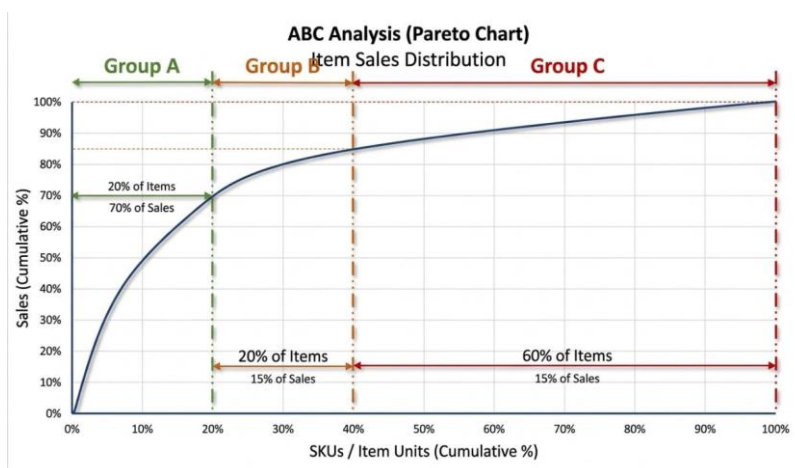



Fig. 1. – Classification of inventory according to the ABC method

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As shown in the figure, 20% of all inventory item names account for 70% of total sales and form group A. The next 20% of items account for 15% of sales and form group B. The remaining group C includes 60% of item names but provides only 15% of total sales.

Different sales policies are proposed for each of the three groups.

The ABC modeling method is easy to apply, while at the same time being a powerful analytical tool that makes it possible to identify the objects that require primary attention, which is especially important under conditions of limited resources. For transport and logistics companies, the main limiting resource is working capital. The financial result is usually represented by the company's revenue. It can be assumed that key clients should be identified according to their contribution to the company's financial performance.

For operating companies, the limiting resource may be the available fleet of railcars; therefore, key clients should be identified based on the revenue generated per railcar. A generalized procedure for conducting ABC analysis is shown in Fig 2.

At the first, key stage, it is necessary to determine the objectives of the analysis, since ABC analysis is used as a tool rather than as an end in itself.

At the second stage, it is necessary to identify the objects to be analyzed, since solving the given task may require influencing different management objects.

At the third stage, the factors on the basis of which the differentiation of the analysis objects will be carried out are determined. The third stage is closely related to the second one: the factors should be selected based on the objects that were chosen for the analysis (Table 1).

At the fourth stage, an information dataset for the analysis is formed. Using the MS Excel tool, it is possible to generate the dataset automatically.

At the fifth and sixth stages, it is necessary to evaluate the contribution of each object to the overall result, as well as to rank the objects in descending order according to the selected factor. After that, it is required to calculate the cumulative total of the share of objects in the total quantity in percentage terms, as well as the contribution of these objects to the overall result in percentage terms.

In the context of transport and freight forwarding companies, the purpose of the analysis is to segment the client base; the objects of analysis are the clients and consumers of the transport and freight forwarding company's services; and the factor used to differentiate the analysis objects is their contribution to the company's financial performance.

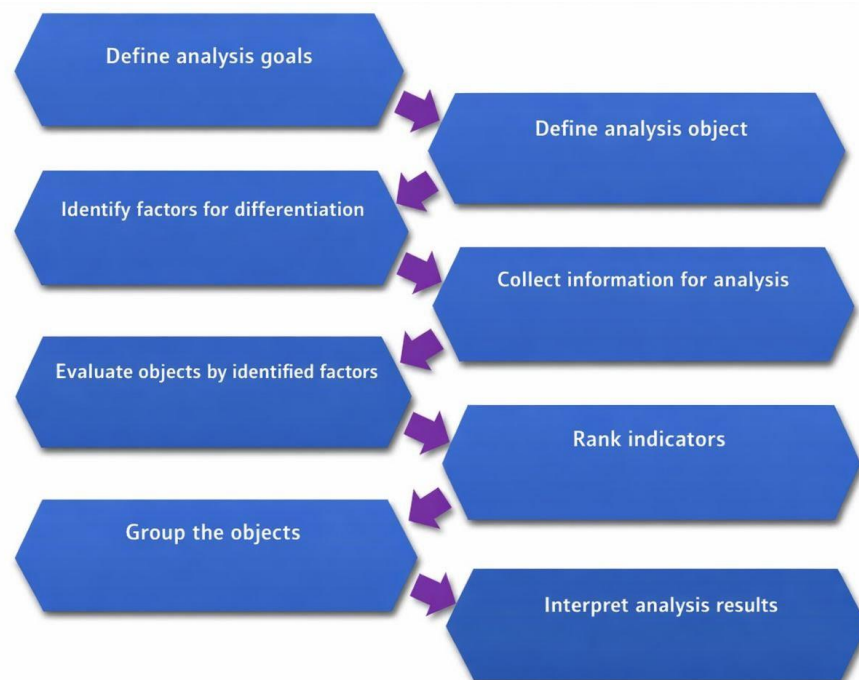


Fig. 2. – Action algorithm for conducting ABC analysis



Table 1

Relationship between objects and factors	
Object	Factors
Suppliers	<ul style="list-style-type: none"> • Current/Average inventory balance • Working capital • Profitability of funds
Customers	<ul style="list-style-type: none"> • Sales volume • Accounts receivable • Average check • Working capital
Assortment	<ul style="list-style-type: none"> • Profitability by position • Sales volume • Inventory stock • Working capital

The application of ABC analysis allows for the differentiation of inventory items based on their degree of influence on a selected criterion. However, to divide resources into groups considering the unevenness of demand, it is necessary to use XYZ analysis. The XYZ method differs from the ABC method in that it is necessary to analyze quantitative indicators in the form of dynamic series of q_i for each i -position of the nomenclature.

Items are classified into group X if their quantitative indicators in the time series fluctuate slightly or remain relatively stable. This allows the use of a trend line of the time series to forecast consumption for the next period with high accuracy. Group Y includes items with significant fluctuations in the time series but exhibiting some regularity or seasonality. Forecasts based on the trend line are less accurate. Group Z is characterized by large deviations in the time series, making it impossible to produce reliable forecasts.

In most logistics studies, the division into groups is carried out using the coefficient of variation:

$$V = \frac{100 \cdot \Omega}{q_{cp}} \tag{1}$$

where q_{cp} - the mean value of the time series;

Ω - is the standard deviation.

$$q_{cp} = \frac{\sum_{i=1}^n q_i}{N}$$

$$\sigma = \sqrt{\frac{\sum_{i=1}^n (q_i - q_{cp})^2}{N}} \tag{2}$$

where N - is the number of periods.

The procedure for conducting XYZ analysis is as follows:

1. Identify the objects of analysis (Client, Supplier, Product group/subgroup, Inventory item, etc.).
2. Determine the parameter by which the analysis will be conducted (Average inventory, RUB; Sales volume, RUB; Revenue, RUB; number of units sold, pcs; number of orders, pcs, etc.).
3. Define the period and the number of periods over which the analysis will be performed (Week, Decade, Month, Quarter/Season, Half-year, Year).
4. Calculate the coefficient of variation for each object of analysis.
5. Sort the analysis objects in ascending order of the coefficient of variation.
6. Determine the X, Y, and Z groups.

A possible distribution into groups, proposed by A.M. Gadzhinsky, is shown in Fig 3.

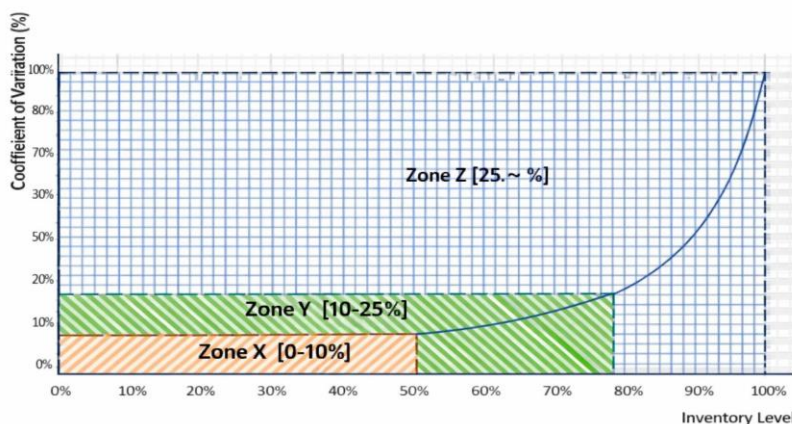


Fig. 3. – XYZ Analysis



Zone X – [0, 10%]: Regular clients, high forecasting accuracy.

Zone Y – [10, 25%]: Periodic clients, moderate forecasting accuracy.

Zone Z – [25, 100%]: One-time clients, forecasting is difficult and inaccurate.

The hypothesis regarding the applicability of XYZ analysis for segmenting the client base of transport, freight

forwarding, and logistics companies needs to be tested on real databases.

Using the data from ABC analysis as well as XYZ analysis, an ABC/XYZ matrix is subsequently constructed, which allows the development of individualized operational management and long-term planning strategies. An individual approach is applied to each cell of the matrix to optimize flows (Fig 4.).

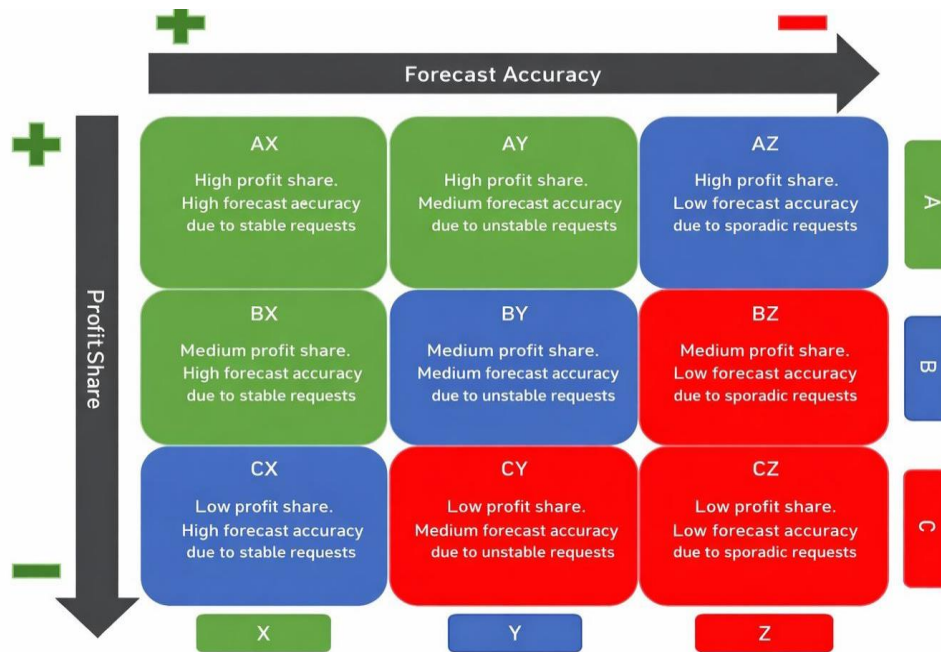


Fig. 4. – ABC/XYZ Matrix

3. Conclusion

With a focus on the interests of clients, it is important for a transport and freight forwarding company to implement a “flexible management system.” This approach, based on collecting and analyzing information, tracking client interactions, and monitoring the profitability of various services, allows the company to develop and adjust service packages that generate revenue while simultaneously improving the quality of client service. It can be assumed that a combined ABC/XYZ analysis can be effectively applied to manage customer relationships.

The hypothesis regarding the applicability of ABC/XYZ analysis for segmenting the client base of transport, freight forwarding, and logistics companies should also be tested using real data.

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