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# TECHNICAL AND ECONOMIC JUSTIFICATION OF IMPLEMENTING OUTSOURCING IN UZBEKISTAN RAIL TRANSPORT

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## INTRODUCTION.

In today's market conditions, in order for a company to operate successfully and be in demand in the market, it must have a comparative advantage over its competitors. The company's management is always faced with the issue of improving the efficiency of the organization's production and economic activities. Currently, there are various ways to optimize business processes, namely: rational allocation of resources, reducing production costs and managing product costs, improving the organization of enterprise management, etc. This article will reflect one of the ways to improve activities - the introduction of outsourcing operations into the production process of the enterprise .

According to (Kalenjyan S.O.) outsourcing is a modern form of business relations, related to the development of joint entrepreneurship and cooperation and based on long-term, strategic decisions.

According to (Veretnov V.) outsourcing is as a way to reduce costs for determining auxiliary operations in order to concentrate funds on the development of competitive advantages

The authors (Mccartney and Arnold) distinguish auxiliary and main production in railway transport. The main production includes railway transportation, and the auxiliary production includes all production facilities that provide railway transportation. These include repair services, as well as services that supply spare parts, water, electricity and other material and technical resources used in the process of railway transportation.

According to (Golovanov and Baranov), for the accounting of transportation at railway transport enterprises, as a rule, the process method is used to account for costs.

To do this, the entire technological process is divided into separate parts, and in each structural unit, records are kept for these separate parts, and the data obtained are summarized.

According to (Basova and Golskaja, 2020), outsorcing contributes to a more efficient use of the financial resources of the enterprise.

According to (L.V. Shkurina, 2020) the main analytical tool for supporting decision-making on outsourcing development is the outsourcing matrix.

**METHODS AND MATERIALS**

This article used methods such as reading and comparing documents, comparative analysis, statistical, tabular, generalization, graphical, arithmetic recalculation and others.

The research on the chosen topic was carried out on the basis of scientific and educational literature, regulatory documents, statistical data and other information sources.

First, let's look at the definition of outsourcing. The scientific literature provides various interpretations of this concept; here are examples of some of them:

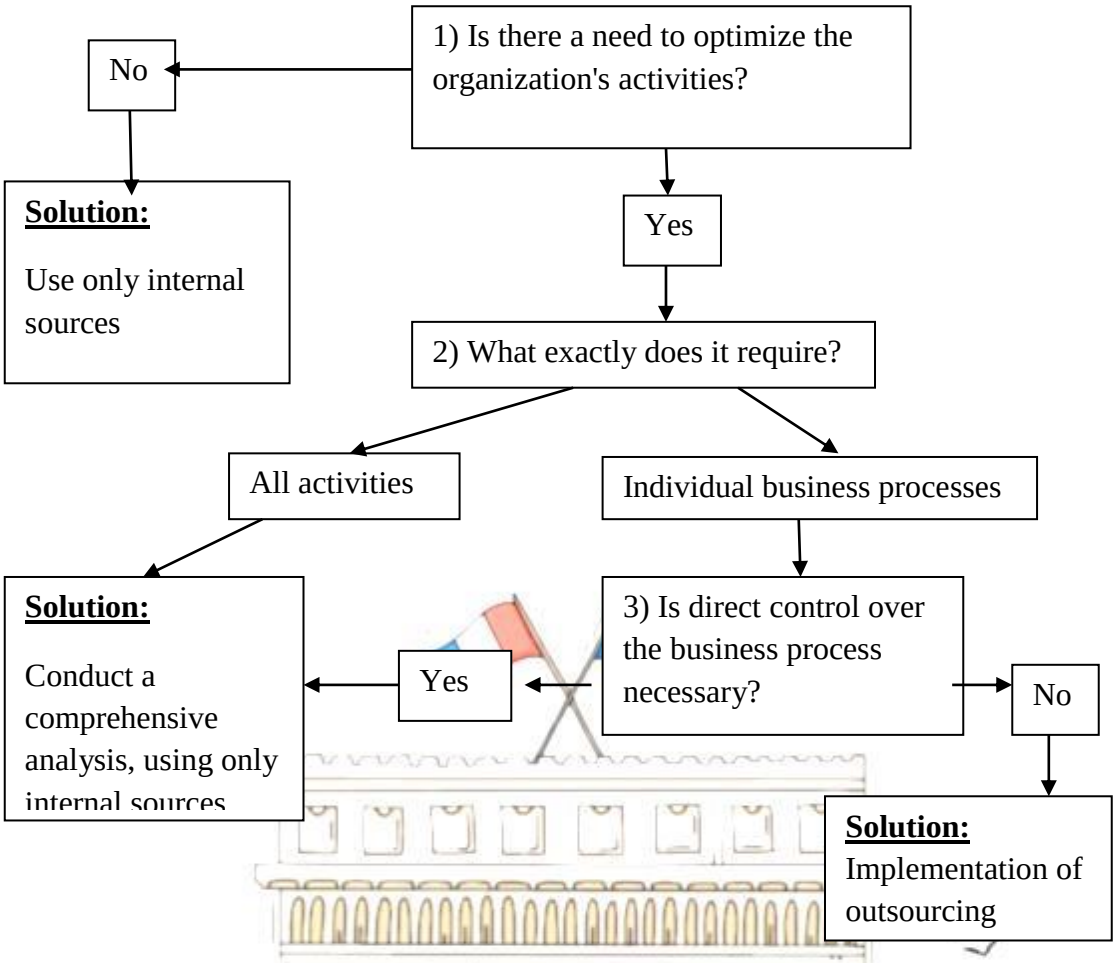
1) abandonment of one's own business process and the acquisition of services for the implementation of this business function from specialized companies [3, p. 201];

2) a form of business activity that implies the transfer to third parties of the non-core functions of the customer company [6, p. 129].

3) long-term and result-oriented interaction with a specialized service provider to assist in running the customer's business. [International Association of Outsourcing Professionals [7].

Outsourcing is increasingly gaining popularity in the market, since, as a rule, these services are provided by competent organizations that have advanced, modern technologies and equipment. With a properly organized transfer of secondary functions to an outsourcer, the customer company reduces the costs of their management (the staff of non-core functions is reduced, time is freed up, which can be spent on the main activity).

It is worth understanding that it is recommended that third parties transfer for servicing precisely those business processes that are not related to the main activity and do not require constant control by management in the organization. To make the correct management decision on cooperation with an outsourcer company, we suggest following the brief instructions shown in the flowchart in Figure 1 below.




Currently, in the market environment there is a wide variety of outsourcing companies providing services in the field of accounting, marketing, logistics, information technology, etc. In this article we will analyze the effectiveness of introducing outsourcing technologies into the activities of a railway company in Uzbekistan.

The main activities of railway companies are passenger and freight transportation, all other types of activities are considered additional, which include: security, cleaning, repair and maintenance of rolling stock, tracks, accounting, etc. After analyzing statistical data, we studied which types of activities are most actively outsourced by railway companies to third-party organizations. According to these data, the acquisition of outsourcing services in the field of security of objects (35%), IT services (17%), communications and communications (14%) is popular [4]. In Figure 2 below you can see in more detail the structure of the use of outsourcing services by companies specializing in railway transportation.

Having studied interviews with several top managers of leading railway companies following the results of the financial year both in Uzbekistan and in Russia, we found a similarity in opinions that the maintenance and repair of rolling stock and locomotives occupy a large share of the company's budget expenditures, which directly affects its financial results . In this article we will look at the process of transferring an auxiliary production function to a third-party outsourcer and analyze the effectiveness of this event.

The main rule for the effectiveness of using outsourcing technologies is lower costs compared to performing the function directly in the company. One of the performance indicators is the savings ratio, which is calculated using the formula below:

$$E(P) = Zx - For, \text{ where } (1)$$

E(P) - savings when the condition E>0 is met or excess consumption when the condition P<0 is met

Zx – costs of a business process performed within the organization

For – the costs of the business process under study performed by the outsourcer.

If the calculated coefficient has a positive value, it means that the costs incurred as a result of transferring a function to a third-party organization do not exceed the costs of the organization's business process, thereby saving the company's own funds. If a negative result of the calculated coefficient is obtained, it is necessary to make a decision to terminate cooperation with the outsourcing service provider, since their services are more expensive compared to performing this activity on the company's own [9].

Calculation of the effectiveness of outsourcing implementation will be carried out using a methodology that includes such research stages as:

1) assessment of on-farm costs for performing the non-core function under study;

2) cost assessment due to cooperation with the selected outsourcing company

3) determination of savings or cost overruns due to the transition to outsourcing of services

4) analysis of the effectiveness of introducing outsourcing into a business process [7].

The costs of maintenance and repair of cars and locomotives consist of the following elements:

1) workers' compensation fund,

2) cost of equipment,

3) cost of parts.

**RESULTS**

We will calculate the need for personnel for the repair depot, as well as their wages. In accordance with statistical data, as of January 1, 2022, the Tashkent metro consisted of 256 units of rolling stock at the NTP. An electric train consists of 4 cars; accordingly, the organization under study has 64 trains. Not all trains operate at the same time; as a rule, 5% (about 4 trains) are in the depot in reserve in case another electric train on the line breaks down.

There are three depots in the Uzbek metro, with an average of 20 operating trains in each of them. One inspector-repairman per shift can inspect and carry out routine repair work on four trains, respectively, for 60 operating electric trains only 15 people are required, five inspector-repairers work in each depot. In addition to routine repairs, rolling stock may require major repairs. These services are performed by repairmen; each depot must have two such workers. According to calculations, the personnel requirement is 21 people.

Having studied the available offers on the labor market in Uzbekistan with the help of the online recruiting company "Headhunter", we found out that the average salary of an inspector-repairman is 7 million soums, and a repairman - 8.5 million soums. Table 1 below presents the required annual costs for the wage fund of employees of the Tashkent Metro. According to the results of calculations, on average, an amount of 1.872 billion soums should be allocated for the payment of wages to workers per year.

**Table 1 - Calculation of labor costs for workers of a railway company**

| Employee | Salary of one employee, sum | Number of employees, persons | Monthly wage fund, sum | Annual wage fund, sum |
|---|---|---|---|---|
| Inspector-repairman | 7 000 000 | 15 | 105 000 000 | 1 260 000 000 |
| Mechanic-repairman | 8 500 000 | 6 | 51 000 000 | 612 000 000 |
| Total | | 21 | 156 000 000 | 1 872 000 000 |

Next, we will carry out calculations of the necessary equipment for servicing and testing the cars.

Since there are three car repair depots in the Tashkent metro, therefore, each of them must contain the necessary equipment for carrying out current and major repairs. Table 2 below presents a list of the minimum amount of expensive equipment for the purpose of servicing passenger cars. According to the calculation results, the total cost of the equipment is 1.019 billion UZS.

**Table 2 – List of necessary equipment for the car repair depot of the Tashkent metro**

| Name of equipment | Price per unit, sum | Quantity, pcs | Total cost, sum |
|---|---|---|---|
| Bridge crane with a lifting capacity of 10 tons | 204 000 000 | 3 | 612 000 000 |
| Electric welding | 13 650 000 | 3 | 40 950 000 |
| Installation for checking train brakes | 13 000 000 | 3 | 39 000 000 |
| Mobile installation for removing and installing the coupling device | 6 600 000 | 3 | 19 800 000 |
| Mobile press | 24 260 000 | 3 | 72 780 000 |
| Mechanized platform | 15 900 000 | 3 | 47 700 000 |
| Hydraulic press | 27 700 000 | 3 | 83 100 000 |

| | | | |
|---|---|---|---|
| Automated test stand for controlling air distributors of passenger cars | 34 650 000 | 3 | 103 950 000 |
| Total | - | 24 | 1 019 280 000 |

The final element of the cost of maintaining and repairing passenger cars is the cost of purchasing spare parts and parts for routine and major repairs. Based on information from the official price lists of similar companies specializing in repair services for railway transport, technical specifications that are publicly available on the websites of these companies, on average 4.22 billion soums must be spent per year on the purchase of parts.

Let us summarize the calculations of the production needs for the maintenance of a car repair depot in the Tashkent metro, which can be found in Table 3. According to the calculations made, more than 7 billion soums are required to open and maintain car repair depots in the Tashkent metro.

**Table 3 - Calculation of the total cost of maintaining the car repair depot of the Tashkent metro**

| Cost element | Cost, Uzbek sums |
|---|---|
| Wage fund | 1 872 000 000 |
| Purchase of equipment | 1 019 280 000 |
| Purchase of parts | 4 220 000 000 |
| Total | 7 111 280 000 |

The second stage of calculating the effectiveness of implementing outsourcing technologies is to estimate the costs of concluding an agreement with a specialized service provider for the repair and maintenance of passenger cars.

The official website of the international association “Metro,” which includes the Tashkent Metro, published information about the major overhaul of passenger cars. According to the data presented, major repairs were carried out for 48 passenger cars, that is, 18.75% of the Tashkent Metro rolling stock was repaired in 2022.

In order for the implementation of outsourcing to be effective for the economic activities of a railway organization, it is necessary to conduct a thorough analysis and selection of outsourcing service providers. The analysis is carried out based on the size of the company, cost of services, and customer reviews.

A search was conducted for potential outsourcing partners and four possible service providers were identified, namely:

1) Foundry and mechanical plant DP
2) Transgroup Systems LP.
3) O’ztemiryo’lmashta’mir UP
4) Tashkent plant for the construction and repair of passenger cars.

After identifying the range of possible suppliers, an analysis of the proposed cost of the contract for annual maintenance of passenger cars, including major and current repairs, was carried out, and reviews of clients of these companies were also reviewed for review. The results of the study indicate that:

1) Foundry and Mechanical Plant DP is a company providing high-quality services, but the cost of the annual service contract is almost equal to the on-farm costs of the railway company under study; the choice of this company is inappropriate.

2) Transgroup Systems LP is a foreign company with a representative office in Uzbekistan, providing high-quality but expensive wagon maintenance services. The proposed cost exceeds the amount of on-farm costs, so it is not advisable to choose this supplier.

3) O'ztemiryo'lmashta'mir UP

4) Tashkent plant for the construction and repair of passenger cars

The choice of a potential partner was made between the companies O'ztemiryo'lmashta'mir UP and the Tashkent plant for the construction and repair of passenger cars. The first company has the most optimal contract value and positive customer reviews, while the second company has a higher contract value and there is no data on the statistics of the company's customer reviews. Thus, it was decided to conclude a contract for annual maintenance and repair of passenger cars with the O'ztemiryo'lmashta'mir UP company. Table 4 presents the input data for the analysis of service providers.

**Table 4 – Initial data for comparative analysis and selection of outsourcing service provider**

| Company name | Cost of services per year, sum | Review statistics |
|---|---|---|
| Foundry and Mechanical Plant DP | 6 900 000 000 | 5 |
| Transgroup Systems LP. | 7 500 300 000 | 5 |
| O'ztemiryo'lmashta'mir UP | 4 313 627 000 | 5 |
| Tashkent Plant for the Construction and Repair of Passenger Cars | 5 554 553 000 | Н/д |

After determining the amount of on-farm costs for maintaining car repair depots in the Tashkent metro and the amount of annual maintenance from the outsourcer, you can find out how rational and profitable this event is. We substitute the values into formula 1 presented earlier in the article and calculate the amount of savings (overspending):

7,111,280,000 – 4,313,627,000 = 2,797,653,000 soum

Thus, as a result of the introduction of outsourcing work for auxiliary production of a railway company, its costs are reduced by almost 2.8 billion soums or 39%.

A decrease in operating costs is reflected directly in the financial result of the organization; expenses are reduced, which means that the tax base and income tax of the organization increase. In this regard, we should calculate additional income tax when introducing outsourcing using the following formula:

$$DNP = (Zx – For) * Np, \text{ where (2)}$$

DNP – additional income tax,

Np – income tax rate

We substitute the values into the formula and get the amount of additional income tax in the amount of 419,647,950 soums.

Since the organization must pay this tax amount, the next step is to calculate the conditional savings from the introduction of outsourcing work to the enterprise. Conditional savings are calculated as follows:

$$Eusl = Zx – For – DNP, \text{ where (3)}$$

Eusl is an indicator of conditional savings after paying additional income tax.

So, the conditional savings from transferring a non-core function of an enterprise to a third-party outsourcer is 2,378,005,050 soums.

At the final stage, we will evaluate the effectiveness of introducing outsourcing to the enterprise. The previous stages of the study contained analytical procedures of a quantitative nature. And in this case, we will conduct a qualitative analysis based on the factors indicated in Table 5 below. Each factor is assessed for the outsourcing form and the traditional form of doing business. If a factor is typical for a particular form, then it is assigned a value of one point; if the factor is not typical for the form of business under study, then a zero is substituted [4, p. 101].

**Table 5 - Comparative analysis of the quality of outsourcing services and traditional forms of business**

| Evaluation factor | Weight of the factor | Outsourcing | Traditional form |
|---|---|---|---|
| Economic efficiency | 0,2 | 1 | 0 |
| Effectiveness | 0,18 | 1 | 1 |
| Profitability | 0,22 | 1 | 0 |
| Satisfaction | 0,1 | 1 | 0 |
| Social protection of employees | 0,15 | 0 | 1 |
| Job preservation | 0,15 | 0 | 1 |
| Total | | 4 | 3 |

After assessing the factors, it is recommended to calculate the effect of the organizational form of implementation of the business process, calculated by the weighted average sum of points multiplied by their weight.

Let's substitute the values for both forms of business:

1) effect of outsourcing = 0.2*1+0.18*1+0.22*1+0.1*1+0.15*0+0.15*0 =0.7

2) effect from the traditional form of business = 0.2*0+0.18*1+0.22*0+0.1*0+0.15*1+0.15*1=0.48

Efficiency assessment is determined by comparing the effect of outsourcing and the effect of the traditional form of business. If the obtained result is more than one, then the introduction of outsourcing into the business process is effective for the organization. Let's substitute the values into the formula:

Eph = 0.7/0.48 = 1.46

**CONCLUSIONS**

Based on the results of the analysis, we can draw a general conclusion that in this case, the transfer of non-core, costly business to a third party for servicing leads to more efficient conduct of the main type of activity: costs are reduced, net profit increases, and it becomes possible to devote more time to the main type of business activity. In order for the implementation of outsourcing work in production to be effective, rational and expedient, the following factors must be taken into account:

1. The business process performs an auxiliary function
2. The business process does not require total control by the company's management
3. The costs of running a business process in-house must exceed the cost of the outsourcing contract.

By carefully selecting a service provider, the company's operations can be significantly optimized. Using the example of the Tashkent metro, we showed the effectiveness of using outsourcing work.

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