

METHODICAL APPROACHES TO ASSESSING THE EFFECTIVENESS OF OUTSOURCING INFORMATION TECHNOLOGIES

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Abstract.

The article analyzes the methods of evaluating the effectiveness of the outsourcing of the information technology. The purpose of the study is to determine the factors of efficiency of the outsourcing information technology, the characteristics of methodological approaches to assessing its effectiveness, including their advantages and disadvantages. Outsourcing of the information technology contributes to the growth of business profitability, helps to maintain the pace of economic development of enterprises. It was found that there are a large number of methodological approaches for evaluating the effectiveness of outsourcing, which made the search for the best of them so complicated, in most cases they are used only partially, taking into account the functioning of each individual enterprise that delegates certain production functions to outsourcers. The competitive business environment requires an assessment of the effectiveness of outsourcing not only from an economic point of view, but also taking into account the social component and risks of its implementation, so quantitative and qualitative indicators of the effectiveness of outsourcing were identified.

It is proved that the method of selecting services for outsourcing should be accompanied by a multicriteria evaluation procedure for selecting an outsourcing service provider, which will take into account not only cost but also quality of services, which is reflected in service flexibility, supplier support, ease of communication with the supplier. technology compatibility and other criteria that can be assessed by experts before the start of the cooperation process.

Keywords: information technology outsourcing, efficiency, efficiency assessment, methodological approaches, risks, criteria.

Introduction

Last time, information technology is being actively implemented and gaining popularity among businesses and is attracting attention from the scientific community and businesses around the world. One of the modern management tools that allows the company to strengthen its competitive advantages in the market by improving the efficiency of management processes and the quality of products and services is outsourcing. The development of modern society requires constant updating and adaptation of the effective management business technologies, especially through the implementing of the outsourcing as one of the high-priority technologies of the modern economy.

An important point in making decisions about the taking the information technology on the board is to understand the benefits of such steps and the feasibility of outsourcing in terms of different methodological approaches to assessing its effectiveness. That is why it is necessary to study the methodological approaches to evaluating the effectiveness of outsourcing.

The question of assessing the feasibility of the transition to outsourcing was studied by such scientists as B. Anikin, Zh.L. Bravar, O. Gurov, N. Karpova, A. Kizim , V. Maslova , N. Meshcheryakova, R. Morgan, I. Ruda, V. Sinyaev, L. Sosunova, V. Shcherban, and others. It should be noted that among scientists there is no consensus on the theoretical and practical aspects of evaluating the effectiveness of outsourcing, so a detailed study of methodological approaches to

evaluating the effectiveness of outsourcing information technology is appropriate and relevant.

1. Analysis of methodological approaches to the assessing of the effectiveness of information technology outsourcing.

Thus, Zoriy O. and Kovalenko T. believe that using outsourcing is reduced to the fact that the company focuses all resources on the main activity and transfers other functions to a reliable partner [3].

At the same time, V. Shcherban proposes to assess the feasibility of outsourcing by determining the change in enterprise costs in the transition to outsourcing and proposes to analyze the financial and economic efficiency of different scenarios of outsourcing by simulation using the Monte Carlo method [19].

According to O. Demcheva, "the key criteria for deciding on the transfer of a function to outsourcing is the assessment of the effectiveness of this tool, which should be based on the individual characteristics of each enterprise and includes not only the definition of savings (by reducing consumption resources) but also taking into account the hidden savings, which is associated primarily with a reduction in the number of objects of management and control. The positive effect can be expressed both in the form of direct savings of resources to perform a particular function and in improving the quality of their performance "[2]. Reducing the cost of production and services, as well as reducing or eliminating costs, related to transportation, safety, operation of vehicles, maintenance and training of personal, information services, improving the quality of customer service (reduction of delivery times, monitoring of transportation processes, reduction of errors, etc.) considers the effect and feasibility of any outsourcing project organizations Anikin BA [1]. The economic effect of such a project is quite a complex parameter, as well as the service itself.

Thus, according to V. Radzivilov, the effectiveness of outsourcing should be determined as a whole - through the definition of the overall economic effect. This approach allows the comprehensive use of quantitative and qualitative methods, as well as "... take into account the complex effect of outsourcing, which includes saving the organization and improving the quality of functions performed, optimizing the implementation of management decisions" [13].

To understand the problem of performance evaluation, we define the concept of the outsourcing effect. Under the indicator of the outsourcing effect L. Ligonenko and L. Frolova consider the difference between the costs in case of carrying out the process on their own and the costs in case of transferring it to a third party organization or comparing the cost of implementing a certain process (outsourcing function) this service from an outsourcer [7].

Evaluation of the effectiveness of outsourcing for the customer is defined as the difference between the investment that had to be made to fulfill the order on their own and pay the contractor for the execution of the order.

In order to decide on the effectiveness of outsourcing Zakharchenko L. and Rybina T. propose to compare the costs associated with attracting outsourcers and the costs of the enterprise, when the same functions to perform on their own. If the ratio of the costs of performing the functions on their

own to the costs associated with the involvement of a third party is more than one, the involvement of a third party is appropriate, if less - it is more profitable to perform operations on their own [14].

This technique is interesting, but has significant drawbacks: the cost in both cases may include different types and cost items, which affects the formation of a comprehensive indicator.

More indicators take into account the methodological approach associated with the calculation of the efficiency of outsourcing - taking into account the costs of the processes on their own, the number of working hours per month, the cost of outsourcing services, and the risk factor.

Thus, Sinyaev V. offers the calculation of the coefficient of economic feasibility of outsourcing, taking into account:

- coefficient of economic feasibility of outsourcing;
- indices of market stability of the enterprise taking into account outsourcing and market stability of the enterprise without including outsourcing;
- annual sales volume;
- share of net profit from sales;
- the probability of success of the business operation, which varies within the scale of success;
- duration of the settlement period for business operations;
- future costs for doing business; total possible market losses, etc. [16].

Followers of this method and the calculations that are included in it are A. Sokolova and I. Filipova. The basis of such calculations is the application of the method of economic analysis. It allows the use of different types of meters (quantitative, monetary, in-kind), gives a specific value for comparing efficiency. However, this technique has certain disadvantages, in particular, the use of projected indicators can affect the accuracy of calculations, as well as make it impossible to take into account all the costs that may arise when working with an outsourcer [15].

Obviously, production experts will evaluate the advantages and disadvantages of using outsourcing before deciding to work with outsourcers. The purpose of using outsourcing by companies is clear: to increase their competitiveness by increasing revenues and reducing costs. The consequence of this is the following methodological approach to assessing the effectiveness of outsourcing, which is based on the results of the analysis of relevant revenues and expenses, taking into account that the result of successful outsourcing should increase income and reduce costs.

This approach is supported by Yu. Zhelinsky, who believes that it is not necessary to use economic methods to assess the effectiveness of outsourcing, it is enough to analyze the income and expenses of the enterprise in certain areas of activity. In his view, the difference between total income and expenses after the introduction of outsourcing should be greater than the difference between total income and expenses before its introduction [20].

The described approaches to assessing the effectiveness of outsourcing are based on its quantitative indicators. However, no less necessary indicator of the effectiveness of outsourcing is quality. Changing the quality of the functions performed is a guide to the feasibility of inviting the introduction of outsourcing in enterprises.

The need to evaluate the qualitative characteristics of the use of outsourcing contributed to the emergence of methodological evaluation of approaches to assessing the quality of functions performed. The main criterion for determining the effectiveness of outsourcing is a positive change in the quality of the sphere of activity, which is transferred to the performance of an external entity. The implementation of this approach makes it possible to assess the positive and negative results of the implementation of outsourcing at the level of quality performance indicators (training, reduction of penalties).

Also worthy of respect is the methodological approach, which determines the defined criteria and indicators for assessing the effectiveness of outsourcing, the main revision of existing criteria in the development, which characterize the significant efficiency as an economic category. For example, A. Shestoperov divides the criteria for evaluating the effectiveness of outsourcing into three groups: changed the cost of performing operations; change in administrative costs; change in the quality of services Shestoperov AM [18].

Thus, the current approach is combined in several and qualitative indicators to assess the effectiveness of outsourcing.

However, the realities of today require an assessment of the effectiveness of outsourcing not only from an economic point of view but also for the study of the social component and the risks of its implementation.

Thus, Tatyank M. believes that the best criterias are cost, time, and social. The use of cost arterial is based on the calculation of cost indicators that expect economic benefits and risks before and after the application of copyright (indicators of profit, return on assets and sales, market value, availability of assets as well). At the same time, the temporal artery involves assessing the effectiveness of outsourcing, as well as predicting short-, medium- and long-term risks. The optional assessment of the impact on the social-economic development of the organization's staff, measured by relevant indicators (the amount of pay and labor intensity, the clarity of vacant or transferred employees, as well as their unknown employment) led to the introduction of social careers [17].

Thus, the analysis of these approaches shows that outsourcing will be effective if the company's employees are focused on the main activity, company specialists constantly monitor costs, ensure transparency of business processes, and a high level of flexibility in case of demand change.

2. Analysis of methods for estimation innovative projects

As was mentioned above, the time criterion is of great importance in assessing the effectiveness of outsourcing.

The development of the IT industry in modern conditions is rapid. In response to all these technologies and methods used to estimate the cost of time, those who need to plan and perform certain tasks require characteristic changes. For use in modern processes, methods change and integrate with each other, creating new ones. This indicates that the latest technologies are changing the stereotypes of doing business.

New technologies contribute to the growth of business profitability, help maintain the pace of

economic development, and promote rapid GDP growth. According to experts, less than 50% of GDP in developed countries depends on new technologies, which are the result of the implementation of innovative projects based on the implementation of innovative activities.

With such drastic changes in the relationship between contractors and customers in today's conditions of fierce competition and development of integrated technology, began to actively develop a new direction of the economy, called "Economy based on the time" (ECT).

ECT-theory of the economic system, which is based on the coefficients of exchange (value), the size of the data, the amount of salary is working time (years of service). It is the reliance on the time factor that reveals the ECT from most other economic systems.

We can testify that in the conditions of modern effective business, the question of time is acute and the signing of long-term contracts is impossible without effective and modern methods of estimation of expenses of time. In order for the expertise provided to specialists to be competitive and specific in the description of this time, you need commands to develop a box of a certain product, to cover individual tasks. Long-term planning is impossible without an adequate and realistic estimate of timeframes because to cover technical links and create the necessary clear journalistic framework that determines quality, and observing the market we could prove that when startups slights those thing then incur insane economic losses.

Economic losses from lost time cannot be reimbursed. The relationship between the categories of "money" and "time" are the most important metrics according to which we can talk about the effectiveness and feasibility of an innovative project. Experts emphasize that the more time constraints that are allocated to a particular task, the more expensive the solution. And in today's conditions, the winner is the one who offers a solution faster, better and cheaper.

Therefore, based on these considerations, the business to solve such problems was forced to look for tools and techniques for planning and estimating the cost of time, which is important in today's competitive environment. Time-saving techniques have come to the aid of business in solving problems with the estimation of time costs, under conditions of uncertain environment and risks of realization, which we cannot calculate in advance.

Translated, estimation is the process of finding an estimate that can be used for a specific purpose, even if the input data may be incomplete, indeterminate, or unstable.

The methods of evaluation of innovative projects include the following: expert evaluation; Delphi method; Planning Poker; three-point weighted assessment or PERT assessment; method of decomposition of works (Work breakdown structure).

In order to clearly understand which of the methods should be used for a particular project, it is necessary to conduct a detailed examination and identify the strengths and weaknesses of each of the techniques. All these techniques should be used primarily when project works on flexible development technologies (Agile), such as Scrum or Kanban. These approaches are aimed at continuous planning and effective implementation of the idea in the best traditions of the modern business model. They consist in achieving the set goals as soon as possible, due to close

communication between team members and the customer and efficient distribution on iterations, which allows to show the customer the finished part of the product, which already works, at the appropriate level specified for a specific iteration.

It should also be noted that for almost all methods of estimating the time spent in the so-called Story point(person-hours).

Story point is a conditional unit based on the basic volume of work, the so-called reference assessment of units. The assessment is carried out on the basis of cooperation of the tasks considered to the basic tasks. The Fibonacci number (1, 2, 3, 5, 8, 13) is used for estimation.

The most common technical time assessment to use is expert mark. Expert mark is based on the experience of experts, colleagues and personal experience. To discuss what is suitable for the use of knowledge, experience, as well as the selection and intuition of professionals who are experts in the field.

As evidenced by the experience of foreign countries, sharing expert opinions can significantly reduce the risks not related to investing in time or unforeseen situations during the project, which will lead to penalties. After all, in today's globalization and rapid development of technology, even highly professional and experienced leaders of the highest level of achievement often fail to take externally risks into account the threats and means to achieve the goal in each situation.

The problem of expert selection remains one of the biggest problems in the field of expert evaluation. There are no methods of forming an expert commission that guarantee the objectivity of the examination. In the general sense, an "expert" is a person who is able to solve the main type of problem in order to draw conclusions, to consider issues related to this type of problem.

Experts of the All-Ukrainian expert network believe that the main indicators of expert potential are: high level of intelligence; extensive work experience; recognition of colleagues; active scientific activity; availability of serious publications; prestigious education; high personal status [10]. Within the method of expert assessment, meetings, round tables, seminars are held, as a result of the interaction of which a collective assessment is formed, which is objective and average, which could handle more risks. This method has registered itself as a reliable and fast way to estimate the cost of time, which works under the condition of environmental stability and economic condition.

The Delphi method, one of the most common methods used to evaluate projects, has been developed in the 1950s and 1960s in the United States. The main task set before it was to predict the impact of scientific developments of the future on the approaches in the military battle.

Despite the fact that the method is encapsulated at the heart of the method of expert assessments, it has many characteristics unique to it. For example, the anonymity of the evaluation and the allocation of common with all possible options to achieve maximum reliability and reliability of evaluation results. Anonymity is the lowest location because each of the team members involved in the assessment can provide an assessment that he or she believes does not take into account external factors, such as being authorized by other team members to determine the assessment, without forcing from the leader and influence of society. This method also uses anonymous multiple brainstorming,

interviews, and descriptions to help resolve ambiguities and questions if a situation of uncertainty arises.

The disadvantages of this approach include the fact that the collective understanding of the problem is not always truth and correct, it depends on the qualifications of experts and their life experience. Also, experts are likely to reject creative and non-standard solutions, and will be based on classic solutions, which are mostly inferior to new and creative.

That is, this approach should be used in cases where experts have a sufficient level of understanding of how the evaluated product will work, but there are factors that are uncertain and provide a basis for discussion and detailed consideration. Under the evaluating such things, experts can not always reach a consensus, and here comes to the aid of Delphi technology, which is well integrated into modern approaches to developing innovative products [8].

Next, it is worth considering the Planning Poker method, which, unlike the Delphi method, is based on openness and public expression of opinion. Also characteristic of this technique is that special cards are used to evaluate the problem, which are the same Fibonacci numbers. All team members gather for a meeting and vote openly for each task - if the scores are very different, the team members with the highest and lowest scores explain their positions and vote again until there is a consensus and differences in scores are minimal.

This approach has a number of advantages over the Delphi method, such as the fact that some people do not always provide competence in the questions asked, and when there is a group of the review, can form more objective assessments. For example, young professionals may not always be able to adequately disclose the full depth of the tasks, and allocate little time for implementation, because an idea that sounds simple may be very complicated and lead to round of changes in the implementation.

Although she may have a social impact and a person who gave some mark and said that she does not have enough time, she would not want to stand out from the crowd and accept conditions that do not suit her, because a team leader gave prominent and more high veight mark during the evaluation.

An interesting method is the evaluation of the three evaluation points of the PERT-evaluation (Project evaluation and review technique). This technique is based on the orinciples,that it is not necessary to use third-party experts to conduct evaluations, as well as to check the members of the teams working on the project. This technique allows you to estimate the required time, listening to pessimistic, optimistic and average estimates in propriated parts.

First of all, team members consider all possible risks, and then identify this form of three marks. Calculations are made according to the following formula:

$$E = (O + 4M + P) / 6 \quad (1)$$

where O is an optimistic estimate; M - the best probable estimate of the term of tasks; P - pessimistic assessment. This formula represents nothing more than a weighted average estimate, where the higher probable estimate of the recovered weight is 4 times greater than the optimistic or pessimistic one. This leads to the conclusion that PERT provides better information because you receive risk information from the people who perform the tasks. This allows us to take useful action before the start of work and reduce the likelihood of reflecting critical risks.

The approach is very popular in the modern management of innovative projects, as it is objective the time-saving which resources are always limited. The accuracy and correctness of the methodology is confirmed by the statistical data that are processed and on the basis of which the final assessment is formulated.

The technique Work breakdown structure (decomposition of works) which consist of deviding tasks to the minimum atomic units and following estimation of the separate minimum tasks . This is justified by the fact that a large and voluminous task is much more difficult to assess than the minimum and atomic. That is, large tasks are divided into some more understandable and put them in the hierarchical sequence, because it helps to clearly allocate the entire scope of work, for a clear understanding, if it is entered into the hierarchical structure. After that, each of the components is evaluated separately and the total calculation of time during the execution of all tasks is determined, as well as from the estimation of time spent on the implementation of the component and the project as a whole.

The positive aspect of using the Work breakdown structure is that it helps properly and clearly organize the process of task evaluation through a graphical representation of existing tasks in a hierarchical structure. Within this methodology, it is advisable to distribute the responsibilities among the team members who will implement a particular features, so that they are familiar with the tasks, and as soon as possible to get involved. Another important advantage is that during the estimation session, team members are constantly communicating, and it leads to greater detail, anticipation of problems and collective brainstorming.

In the conditions of rapid development of the sphere of integrated technologies, innovative projects form the basis of competitiveness of each company. The economic effect of these projects depends on the time of implementation, because the market, tools and technologies are evolving every day, and in order not to be left out with their development, the customer chooses a company that commits to implement his project as soon as possible and at such a level as to obtain an economic effect for the customer. This encourages companies to look for reliable tools and techniques that will help them estimate the time to perform certain amounts of work using time estimation techniques, of which there are more than 20 varieties.

Therefore, considering the main techniques on the basis of which others are formed in collaboration, we can conclude that despite the fact that using of the above techniques is very wide, each of them has a number of disadvantages and advantages over the other, so you need to choose a technique based on specific project and tasks. In our opinion, it is advisable to combine techniques to

achieve the most accurate result of time estimation. This will minimize the risks associated with late implementation of projects, which entails penalties and loss of reputation of the company, which is unacceptable in conditions of fierce competition and does not contribute to the further development of the information technology [9]. The variety of methodological approaches to assessing the effectiveness of outsourcing indicates the needs for a clear understanding of the specifics of outsourcing, the advantages and disadvantages of its implementation and the risks of outsourcing operations and the development of regulations for interaction between customer and contractor.

3. The effectiveness of implementing the information technology outsourcing

Despite the high efficiency of outsourcing, it is quite risky due to the radical changes in the management system of enterprises.

Therefore, it is advisable to determine specific indicators of the effectiveness of automated information technology, which specialists of the enterprise should develop for their assessments, which are shown in Figure 1.

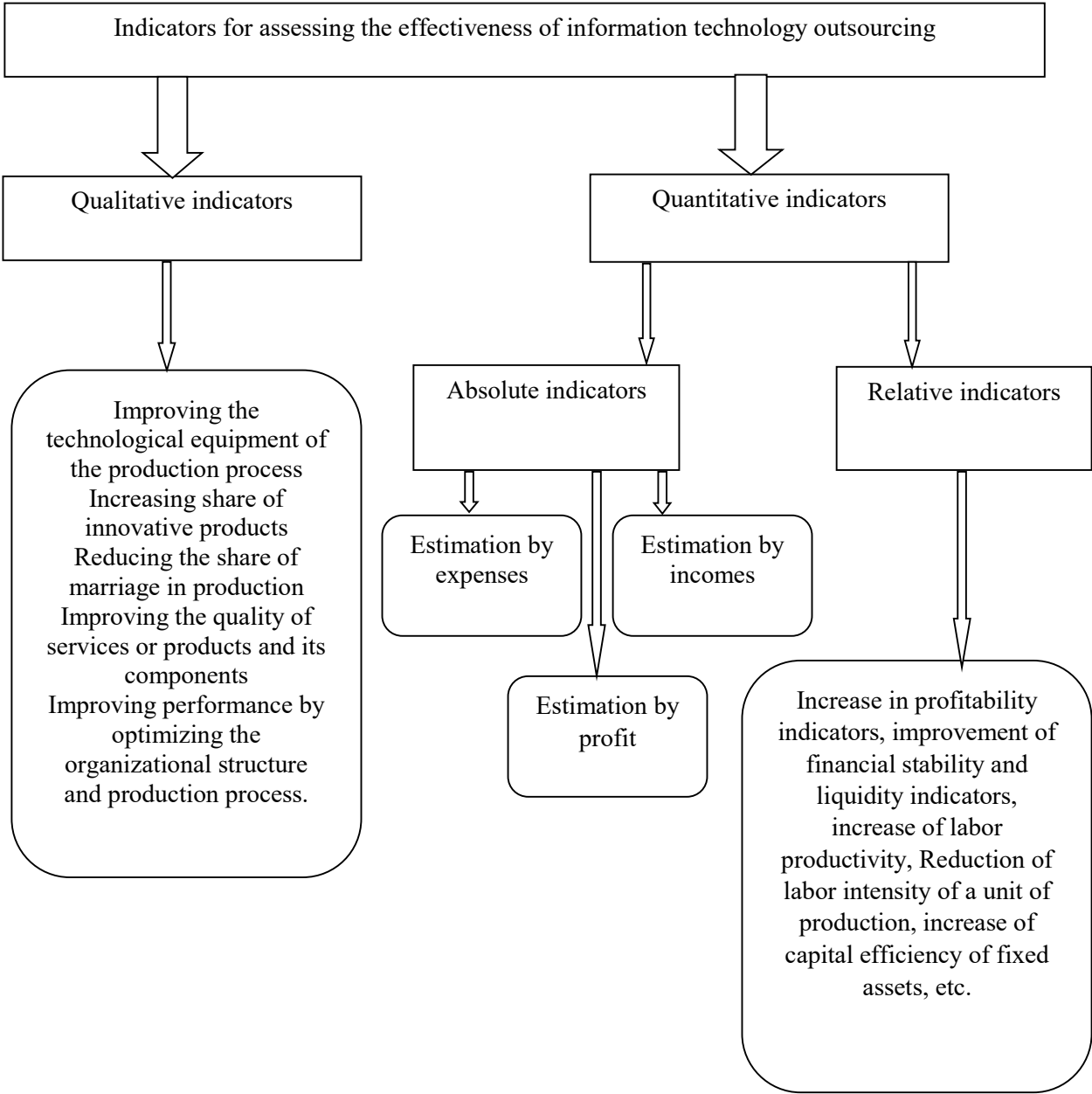


Fig. 1. The main indicators of assessing the effectiveness of information technology outsourcing in the enterprise

As you could see from the figure when assessing the effectiveness of information technology automation, the company takes into account both quantitative and qualitative indicators.

Based on this, we create a calculation of the potential economic effect of outsourcing. In international practice, are existed several approaches to assessing the effectiveness of outsourcing and using each of the methods depending on the available resources in the enterprise.

The most popular are budget and project approaches. The budget approach is often used to evaluate IT projects in the company. In form, it is a table of the compiled IT portfolio of the enterprise in the nearest future, some descriptions of business processes of the enterprise, as well as certain guidelines for project optimization.

According to modern financial theory, there are 4 ways to calculate the effectiveness of a particular project for the company: return on investment, set of terms, net profit project, internal profitability.

To calculate net present value (NPV) or internal profitability, you need to keep in track many parameters (cost of capital, tax effect, residual value), which are often difficult to obtain in the enterprise.

Therefore, you can apply the following formula for calculating economic efficiency.

$$E_{outs.} = \sum \text{expens.own} \div \sum \text{expens.outh.} \quad (2)$$

Where $E_{outs.}$ – outsourcing effectiveness:

$\sum \text{expens.own}$ - the amount of costs for performing functions with the help of internal resources;

$\sum \text{expens.outh.}$ - the amount of costs for performing functions through outsourcing.

If the efficiency of outsourcing > 1 , then the economic effect is positive, it should be implemented. If the efficiency is < 1 , then the effect is negative, and therefore, outsourcing some of the functions is not economically justified.

This approach to performance definition is basic, thus helps to get a logically determined effect of implementation. If necessary, further detailed calculations of NPV, internal rate of return (ROI), etc. can be performed.

It should be noted that the development of management and information technology in recent decades has led to the emergence of increasingly large and expensive corporations to the information systems that requires special approaches to assessing their performance and efficiency. Many authors, including RJ Klepper, B. Kweku-Muata, and others, explains the increasing in the efficiency of information systems to the implementing of the IT outsourcing. The development of network technologies, the emergence of new technological solutions in the field of information services require the development of decision-making methods to justify the transfer of certain information services to outsourcing and selection of external providers of these services [5,6].

IT outsourcing as a system of providing information technology services to enterprises and organizations by other specialized companies shows significant development in recent decades, especially the ability to use software applications on lease (APS, Application Service Providing).

The growing role of enterprise management information systems, on the one hand, and the increase in their costs, on the other, require the development of new approaches to improving their efficiency.

Considering the variety of IT outsourcing, using complex information systems of large and medium enterprises, it is impossible not to visit such a thing as cloud services and technologies. In the modern understanding of modern technologies, tools are created that provide various services (data), provided via the Internet. Among them, as a rule, exist next difference: software services (Software-as-a-Service, SaaS), the possibility of using a software and hardware platform (Platform-as-a-Service, PaaS), the provision of infrastructure services that implemented as a lease of virtual servers (Infrastructure-as-a-Service, IaaS) [12].

In recent years, cloud services have also been actively developed, which allow to use of a corporate applications on lease. This effect allows to achieve both due to economical materials costs for the maintenance of own servers, licensing of software applications, salaries of IT staff, and due to the advantages that provide greater mobility of corporate additional enterprises, as well as a greater degree of integration into the e-commerce system. Despite the privacy of such models, available with obvious benefits for the company, there are many problems: data on security risks, known losses efficiency of analytical information of the organization and etc.

A model that allows you to assess the impact of IT outsourcing on the results of the enterprise, introduced in the work of G. Kite. It uses a production function [4].

Also interesting are the methods of decision-making on the outsourcing of service information systems of the Cobb-Douglas enterprise, in which the outsourcing capital is separated:

$$\ln Y = y_{IT} \ln(OSIT) + \alpha_K \ln(K) + \alpha_{IT} \ln(IT) + \alpha_L \ln(L) \quad (3)$$

where - y_{IT} is the elasticity of output relative to IT authorization and α_K , α_{IT} , α_L are the elasticity of the transition to other resources (OSIT - outsourced computer capital; K - capital; IT - own computer capital; L - labor) .

This model, based on the analysis of statistical data, allows us to estimate increasing costs in the audit for the performance of the enterprise. While the choice is made to determine the equity for the existing accounting methodology in Ukraine, the problems of using an effective information service provider are trained in the need to develop methods to discuss decisions on information technology implementation, selection of APS provider, transfer to outsourcing of some information services.

From the point of view of the institutional approach, the transfer of some information business processes when performed by an external provider makes sense when performing optimal cooperation

between the changed transaction effects that are in autosing and the costs of its organization. It is clear that the introduction of outsourcing has a positive effect on the changing of the efficiency the information systems, if the additional transaction costs for the organization of outsourcing do not exceed the economy on the total costs generated by the system when outsourcing parts of functions. Features of value when making decisions about automation of information services - the best choice. These tasks are solved using expert methods.

The analysis of the methodology of multi-criteria selection on the basis of expert opinions was performed with the participation of S. Oprykovych and G.-Kh. Zenga, which compared the VICOR methods (the name of which originated as an abbreviation of the Serbian name Multicriteria Optimization and Compromise Solution), TOPSIS (Technique for liking an order similar to the ideal solution), PROMETHEE (Method of estimating enrichment provided by the organization of choice) and others. All these methods allow us to rank solutions based on many conflicting criteries according to the degree of their approximation to the "ideal". All of these methods use different approaches to generalization and normalization of data, some of them allow the use of interval assessment , which solve the problems of uncertainty of experts and determine the risks of decisions [11].

It is important to develop models and methods to choose the best ratio between own and outsourced information services on the basis of minimizing total costs, which include the cost of maintaining or paying for services and the cost of organizing cooperation with providers of these services, if outsourced. These costs include transaction funds for the organization and maintenance of outsourcing agreements, quality control of service delivery and overcoming opportunism both inside and outside the organization. The total cost of ownership of the enterprise information system during the implementation of IT outsourcing can be expressed as

$$TCOIS+OS = TCOIN + COS + COR \quad (4)$$

where TCOIS+OS – the total cost of ownership of the information system in the transfer of some functions to outsourcing;

TCOIN – total cost of owning own information services;

COS – cost of outsourcing services;

COR – additional transaction costs incurred during the organization of IT outsourcing, and associated with the search for outsourcing providers, negotiation, quality control and security of services, etc.

Conclusions

Thus, the introduction of outsourcing is expected to save resources, reduce costs, and improve the quality of work. To determine accurate estimates, information about the experience of applying the chosen method of performance analysis over a long period of time is required. Before implementing of the outsourcing to the company structure, management should conduct a thorough

cost-effectiveness analysis and risk assessment. To simplify these procedures, independent business process outsourcing consultants can be involved. The application of practical experience in outsourcing management will increase the probability of its successful implementation and, as a consequence, will bring the company to a new level of competitiveness in the global economy. Thus, the implementation of information technology outsourcing is a complex and complicated process, for the successful implementation of which it is necessary to conduct a thorough risk analysis, assessment of economic efficiency, control and choose the right method of its implementation. Using of the model of substantiation of the decisions on transfer of separate functions of information service to outsourcing in a complex with the model of choice of the provider of outsourcing services will allow to apply the newest technological decisions in the information system development and to increase its general and institutional efficiency.

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