

MEASUREMENT OF TRANSACTION COSTS IN INFORMATION TECHNOLOGY OUTSOURCING

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Abstract. Improvement of outsourcing transaction costs formation in companies enables not only increasing decision quality and business efficiency but also expands competitiveness of the country in international markets that have impact on the volumes of outsourcing in the country.

Outsourcings have become one of the strategies, used by business companies in order to manage their information technologies. Over the recent years use of outsourcing has instigated the appearance of the scientific literature on this topic. Therefore, the author of this article analyses the scientific literature aimed at determining the main themes and methods, usually used by different authors and countries in the field of IT outsourcing. Thereby, this article includes the review of the IT outsourcing articles, published in business and management journals.

JEL classification: D21, M21.

Keywords: outsourcing, transaction costs, contracts, information technologies, IT services.

Reikšminiai žodžiai: išoranda, sandorio kaštai, kontraktai, informacinės technologijos, IT paslaugos.

1. Introduction

The authors who analysed development and international links of transaction costs' phenomenon (Williamson, 1998; Feenstra, 1998; Gatautis *et al*, 2002) name Coase as the originator of the theory of transaction costs economics. This theory includes four research fields in which transaction costs are dominant. According to Williamson, O. E. (Williamson, 1998), the theory of transaction costs economics provides more opportunities to estimate the role of transaction costs for economical performance. This shows that perception of transaction costs is extremely important for better understanding of any empirical phenomenon related to business.

According to the theory of transaction costs, they are positively related to:

- necessity to invest in long-term assets;
- irregular transactions;

- complexity and uncertainty of the task;
- difficult to measure task results;
- independence from other transactions.

The research revealed that by entering into an outsourcing agreement, a customer and a service provider conclude a contract in which they design compulsory legal, institutional systems, rights, duties, aims and responsibilities of each party, politics and strategies based on mutual agreement.

While evaluating the importance of transaction costs, Gatautis and other scientists (Gatautis *et al*, 2002) state that *transaction costs* are the costs which appear when goods or services are exchanged, but they are not the costs related to the creation of a good or service.

Transaction costs are researched in many economic studies. Acquisitions and associations provide more opportunities to act independently in any economic cycle. One of the most important reasons showing why it is worth making acquisitions and associations is economic slowdown. The studies revealed that institutions related to the provision of outsourcing services play the main role in transaction costs economics. Different institutions can generate different transaction costs. Transactions are usually made on the basis of formal or informal contracts. It is extremely important to keep transaction costs low because otherwise any modern company will not be able to compete in international markets.

Outsourcings have become one of the strategies used by business companies to manage their information technologies. It has encouraged the appearance of the related scientific literature during the last few years. The author of this article has analysed the literature in order to identify the most important topics and methods, applied by different authors and countries in the field of IT outsourcing. The author also makes suggestions on the ways to improve research in this field. The article contains the review of the articles on IT outsourcings published in the leading journals of economics.

According to Heakal (Heakal, 2002), markets in the real world cannot be fully efficient or fully inefficient. A real market is a mixture of these two extremities, where daily decisions or events not always are immediately reflected in the market. In the age of IT, markets all over the world are becoming more efficient because of the increased pace of information flows and transaction making. However, at the same time IT can become the reason of market inefficiency, if unreliable information is used because decisions must be made immediately and there is no time for verification of the data.

After the analysis of the scientific literature, it can be stated that investments in information technologies and production outsourcings are related to low costs and higher quality of goods.

In order to feel strong in the market, companies have to make products of the highest quality with the lowest costs using advanced technologies and being trustful and innovative. Having limited human and capital resources, managers have to clearly define the spheres where to direct the time and investment. It is especially important to

determine whether investment in non-core activities or additional functions are actually worth it and whether it is better to make use of outsourcing and transfer them to the service providers specialising in this field.

It is important to note that one of the main factors for choosing IT outsourcing is that the company deciding to buy outsourcing services does not have to care about attraction of professionals, their maintenance and training. It does not have to buy and renew necessary equipment because these processes are performed by an outsourcing supplier. Thereby, the company can concentrate on internal opportunities and the spheres in which it specializes. Buying outsourcing services often provides opportunities to choose fixed or variable costs and obtain outsourcing services for the fixed monthly fee, therefore, companies can draw up more precise budgets. What is more, when the need to use outsourcing services disappears or the contract term expires, it is possible to stop buying the service, which is not possible, when the company invests in the equipment and hires people. Another positive factor is the quality of the service.

Companies providing IT outsourcing services have more experience in dealing with rented processes than internal departments or individual employees, as service providers can use their extensive internal resources. Furthermore, employees of outsourcing companies often deal with different customer problems and new technologies, so solutions to customers' problems are usually prepared before they are needed. Other often stressed advantage of outsourcing services is clear responsibility. Transferring administration of software and technical equipment made by different producers to one service provider enables saving time necessary to find and solve the problem. Analysing the technological aspect of outsourcing service provision, it is necessary to clearly define whether outsourcing service buying is going to be a onetime project or long-term co-operation between a service provider and a customer.

Scientific problem – classification of transaction costs in IT outsourcing.

The aim of this article – determination of the main aspects of transaction costs' measurement in IT outsourcings.

The methods of the analysis are as follows: logical, systematic analysis of scientific literature based on comparative and summary methods.

Practical application – this article reveals imbalances between outsourcing environmental factors and the real outsourcing practice.

2. IT outsourcing services

Outsourcing is considered as one of the easiest solutions, so many companies use it quite often (Butter, Mosch, 2003). In order to show which process of outsourcing is comprehensively useful to the company but at the same time has quite many threats, the author presents the main advantages and possible threats of outsourcing process in Table 1.

Table 1. Advantages and disadvantages of outsourcing with regard to the company
(prepared by the author)

Advantages with regard to the company	Disadvantages with regard to the company
Cost reduction	Loss of control of the transferred process
Time cost reduction	The process is hardly restored
Revelation of hidden costs	Moment costs
Stock price increase	Moral
Simpler control of expenses	Loss of quality control
Quality	Reduction of the number of staff
Cultural exchange	Flexibility loss
Reform of processes	Lost opportunities
Technical aid	Transaction costs
Concentration on more effective management	Plenty of clients

When a company decides to reduce costs or shorten the time, it chooses to buy outsourcing services (Javalgi *et al*, 2009). Table 1 shows only some primary advantages of outsourcing services. If the company has been practising outsourcing for longer time, its hidden costs can be revealed. These costs are revealed after transferring the process out of the company when it becomes possible to estimate how much such process would have cost inside the company. The outcome of cost reduction is rise of company's stock price because the company shows better results (Bhagwati *et al*, 2004).

The research has revealed that there is a link between aims and size of the company. That is why outsourcing is sometimes considered to be a part of company's strategy, and such advantages as simpler control of expenses or reform of processes are important in company's business (Abraham, Taylor, 1996). Making reforms, companies have more possibilities to monitor processes, perform more efficiently and easier control and plan their costs because costs of the transferred processes become fixed on the basis of the contract (Javalgi *et al*, 2009). Practising IT outsourcing, companies can also get better quality of products or services because outsourcing service provider usually seeks for the best quality of the transferred process using all knowledge, labour and technological resources available to him. Service provider also guarantees all the necessary technical aid (Bartkus, Jurevičius, 2007).

It is important to note that the company practising outsourcing faces particular threats arising from this process. Firstly, it can lose control of the process because transferred process is performed under the conditions of the contract from its beginning till the end (Tomiura, 2005). That is why the company finds it difficult to control the quality of the product or service and be responsible for it. Companies – service providers often demand for long-term contracts which would ensure profits. Short-term contracts increase contract costs (Gatautis *et al*, 2002). The research revealed that companies have to consider all possible threats before starting the process of outsourcing. Outsourcing can bring more costs and time expenditure than the company has initially expected, so losses can exceed the benefits (Swenson, 2004). This way, outsourcing can even make damage to company's competitive advantage. Benefit or damage of out-

sourcing depends on country development level, economics, volumes of outsourcing in the country and many other factors (Siegel, Griliches, 2002). In order to analyse positive and negative effects of outsourcing on the country, countries should be classified according to their development level (Reca, Zieg, 1995).

At present outsourcing takes different forms. Organisations are still hiring service providers to manage different business processes, for example, payroll management. However, some organisations order the services for the management of all operations. The most popular forms of outsourcing are information technology outsourcing (ITO) and business processes outsourcing (BPO). Outsourcing process usually includes four stages:

- strategic decision to develop organisational philosophy on the role of outsourcing;
- evaluation and selection when the customer decides on suitable projects and potential locations and service providers consider opportunities to implement that;
- contract making, service level agreement (SLA);
- management of external services or improvement of present relationship between the customer and the outsourcing service provider (Snieška, Drakšaitė, 2007).

IT outsourcing is buying of information technology services from specialized IT companies. It includes buying services such as installation of computer systems, computer maintenance, strategic formation, activity coordination from an outside provider partly or fully resigning technology professionals inside the company (Claver *et al*, 2002). Outsourcing is especially important for small business because of the limited resources and limited competence of the executives. Services in general include few elements of search and elements of experience and trust, which impedes explicit evaluation of administration service outsourcing decision, so for evaluation of the reasons of administration service outsourcing decision, the author uses particular chosen elements of transaction costs economics which, as it is thought, stimulate outsourcing of administration services (Snieška, Vasiliauskienė, 2008).

Today, when companies seek to increase business efficiency and competitive abilities, information technologies are becoming increasingly important. In order to properly maintain the environment of information technologies, it is necessary to understand all spheres of IT (computer break downs, nets, hardware, software, databases, information protection and so forth). All of these tasks are impossible to fulfil by a single professional, physically unable to follow all technological novelties. If a company wants to have a reliable and qualified team, it has to hire well-paid professionals. Only large and strong companies can afford that. However, this causes additional problems – the work of IT professionals is very uneven. In order to solve the arising problems they sometimes work overtime, and sometimes they have almost no work. The factors such as holidays, illness and personal problems make their work even more uneven. Buying IT services from outside helps to solve these problems in many cases (Siegel, Griliches, 2002).

Outsourcing services have already spread in the West. Lithuanian companies have also begun to concentrate on the main activities and buy secondary services from outside professionals. Companies working with many IT projects from different customers gain huge experience, which is impossible when dealing with the tasks of one kind, so

outsourcing service providers better know the ways to identify and solve IT problems of different companies (Bagdonas *et al*, 2004).

Information technologies tend to become outdated very quickly – the technologies that were the latest half a year ago can be both morally and technically outdated at present time. That is why IT companies have to consider such particularity and adjust to it. Participation of a customer is also a very important factor in this process (Murphy, 2004). Figure 1 shows the core computer sales, hardware and internet services usually provided by IT outsourcing companies. It also explains accessibility of the services, interaction ‘between a customer and a service provider’ (Mackenzie, 2006) and customer participation in the service provision.

Core services			
Computer sale and hardware			
Internet services			
Service accessibility	Facility services	Maintenance services	Interaction
<ol style="list-style-type: none"> 1. Central office in the city centre. 2. Flexible working hours. 3. Attractiveness of training facilities, modernity of training equipment. 4. Opportunity to order service in different ways. 5. Qualification of training personnel and attendants. 6. Comprehensive and clear documentation and instructions of software use. 	<ol style="list-style-type: none"> 1. Software installation. 2. Software renewal. 3. Software creation. 	<ol style="list-style-type: none"> 1. Computer literacy courses. 2. Training to work with specific software. 3. Distance training. 4. Consultations on computer use. 5. Technical computer maintenance. 6. Different ways to order services. 	<ol style="list-style-type: none"> 1. Interaction with the personnel taking orders. 2. Interaction with training personnel and attendants. 3. Interaction with software.
Customer participation			
<ol style="list-style-type: none"> 1. Knowing whether the customer fully understands requirements of the software. 2. Knowing whether the customer has learnt to work with the software. 3. Customer’s disposition to provide additional information. 			

Fig. 1. Model of IT service provision concept (prepared by the author)

The analysis of the scientific literature has revealed that information technologies can significantly reduce the costs of information search.

3. Transaction costs and IT market

Use of information technologies reduces transaction costs of information search, storage and transaction coordination and control if customers and service providers are connected to the central electronic database. Transaction costs can be reduced when transactions are made using e-commerce. Direct and indirect costs (appearing because of the open standards), reduction of uncertainty and asset specificity can also appear in this field. With the use of e-commerce, transaction costs can decrease because of the lower costs of: 1) information search; 2) coordination and 3) payment process.

Transaction costs include the costs necessary for the transaction to be made. In real markets these costs can be related to ownership, advertising and so forth. For example, in e-commerce these are only advertising costs because sellers do not need to present their assortment in a physical area. However, other fixed transaction costs such as maintenance of the e-shop or internet connection can emerge.

Fixed costs can be lower when the products are presented on-line rather than physically. In this case, a place with proper infrastructure has to be chosen in order to attract a customer while an internet server can be located in a very distant place or can even be shared with suppliers or agents. Selling with the help of 'seeing and touching' is different from selling on-line, but the latter requires lower expenses. Lower market entrance costs motivate new players to enter, therefore, competition increases, and this determines a wider choice of goods for customers.

Correlation coefficients calculated in the research revealed that the spread of e-commerce has a positive impact on minimisation of transaction costs, especially the ones related to information search, production-technological operations and choice of logistics and agents.

One of the effects of outsourcing – changes in labour market – draws much attention of the economists. Different scientists, evaluating factors of outsourcing transaction costs, differently support their opinions and make different (sometimes even opposite) conclusions about the effects of outsourcing on unemployment level. The main object of the discussions is loss of workplaces. In general, integration of different markets caused by globalisation, fast development of IT and changes of business management concepts has determined integration of labour markets and formation of international work teams. However, some scientists state that outsourcing leads to reduction of the number of high-qualified employees and increases unemployment rate (Bhagwati *et al*, 2004). But this does not mean that increase of unemployment will last long. On the one hand, there is always an opportunity of retraining (of course, it requires time and effort), on the other hand, outsourcing may result in decrease of unemployment of high-qualified employees. For instance, the survey of the opinion of high-qualified employees carried out in the USA (which included

the respondents whose annual income exceeded \$ 100000) showed that the number of free trade supporters went down from 57% in 1999 to 28% in 2004 (Amiti, Wei, 2004). Such evaluation of free trade and effects of outsourcing facilitate conditions for lobbyist activities which prefer application of different protectionist means. For example, lobbyists in Australia offered that producers of software were forbidden from concluding contracts with Indian companies for the services related to software development and purchase by means of outsourcing. Similar examples could be found in trade and industry policy of most countries.

Increase in labour demand directly impacts the increase of wages. Therefore, it is impossible to unambiguously evaluate outsourcing as useful or harmful for a country's labour market. What is more, although use of outsourcing can increase unemployment of high-qualified workers in the short term, it can also cause increase of employment in the long term because increased profits can encourage companies to expand their activities and hire additional workforce, especially when a company has competitive advantage and transfers non-core activities to the countries of cheaper resources which increases competitiveness of the company's goods (services). This can determine the increase of the labour force needed for the creation (production) of particular goods or services. At that point, the level of unemployment in outsourcing providing country goes down because of the labour demand increase. For the same reason wages of high-qualified workers (because most workers working in outsourcing service sector have higher education) go up. According to Meshcheryakova (Meshcheryakova, 2005), when applying outsourcing, 'qualification bonus' – difference between the wages of high and low-skilled work force in the country applying outsourcing increases and decreases in the country providing outsourcing.

The empirical research carried out by the author in the field of wage changes while applying outsourcing has revealed that protectionist means (particularly – import duty) in the country (the USA) leads to wage decrease for high-qualified workers and wage increase for low-qualified workers. The profits of domestic investors also increase. However, according to Meshcheryakova (Meshcheryakova, 2005), the benefits of such duties do not compensate wage decreases for high-qualified workers. Therefore, application of import duties does not bring economic benefits to the country. What is more, according to Siegel and Griliches (Siegel, Griliches, 2002), the difference between wages of high and low-skilled workers is determined by technological development and need of professionals for the management of these technologies. Besides, necessary skills enable faster understanding of technological innovation and, of course, bring faster benefits. Figure 2 shows the structure of Indian labour force (in outsourcing service sector) according to business activity sphere and reveals great importance of information technologies.

The pace of the workers' increase in IT sphere is faster than in other sectors. Some scientists forecast that it will get even faster. In addition, the study carried out by Siegel and Griliches (Siegel, Griliches, 2002) revealed that the development of IT services has the greatest impact on the changes of labour force structure (when high-qualified work force takes bigger comparative part than low-qualified work force).

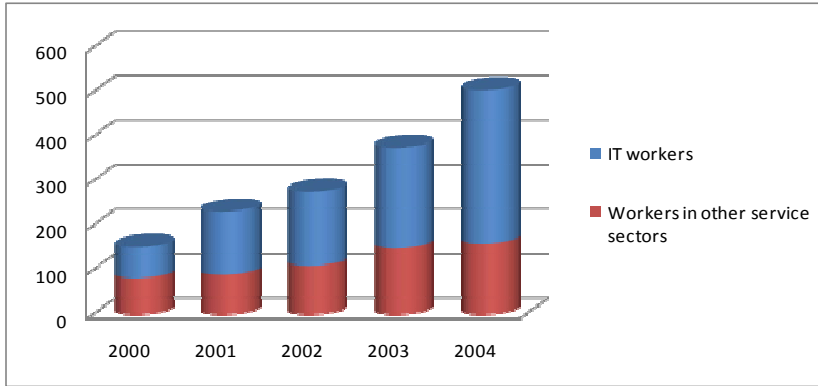


Fig. 2. Structure of Indian labour force according to activity sphere on outsourcing service sector (Hilsenrath, 2003)

The research revealed that outsourcing and elements of transaction costs determine labour cost reduction in global economics. For instance, a trade association or policy which determines the level of particular wages does not have significant impact on the companies performing in other countries or their wage policy. Therefore, companies, considering their own business peculiarities, can hire work force abroad on the basis of contracting much cheaper than they could do it in domestic country. With reference to Feenstra and Hanson (Feenstra, Hanson, 1996), it explains the increase of the difference between wages of high and low qualified workers.

According to Hilsenrath (Hilsenrath, 2003), even biggest losses experienced because of outsourcing transaction costs make only a small part of all losses experienced because of other reasons or all lost work places. For example, during the last decade, the USA lost about 15 million workplaces annually (when people retire, they leave many workplaces). However, this does not mean that the rate of unemployment in the USA should go down in the long term because these workplaces are transferred to other countries such as India or the Philippines. Anyway, considering the fact that the number of retiring people is increasing, some authors are of the opinion that by 2012, the USA will not be able to fill more than a million workplaces (Pralhad, Hamel, 1990). The problem of population 'ageing' and lack of workers is relevant for the countries like Germany, France, Great Britain or Japan. This problem can be solved in two ways: either immigrants occupy free workplaces or the elements of outsourcing transaction costs are applied by making contracts with companies operating in India, China, Russia, the Philippines or the countries of Eastern Europe. In addition, the benefits of outsourcing can be explained by the improvement of trade conditions in the country caused by reduced production costs, increased demand and export volumes. This can also cause excessive demand of particular product or service. However, in many cases, the result of outsourcing is a product or service having a high added value for a customer. Economic benefit is also gained as outsourcing enables the use of resources which probably cannot be found inside the country.

The analysis of the scientific literature suggests that R&D activities related to the elements of outsourcing transaction costs are taking pace, however, they still make a comparatively small part in overall R&D activities. One of the reasons for this is that companies are afraid of the disclosure of trade and production secrets under the conditions of imperfect competition. But at the same time, companies seek to make their products and services more competitive, and with reference to the theory of product life cycle, they must reduce costs. One of the ways to do that is to reduce R&D activity costs. Making the decision, companies should make sure that they will work with high-qualified people who are able to co-operate and will avoid the risk of information leak causing higher outsourcing costs. Cost reduction can also be interpreted as product innovation when the launch of a renewed and improved product helps reducing company's costs. In cases when a company transfers R&D activities abroad, it is important to agree on the payment for the research. If a company chooses a fixed pay, it is not as effective as payment depending on work results. On the other hand, R&D outsourcing can be interpreted as the way to improve the quality of the product and innovation process which enables reduction of company's costs. Since foreign trade consists of export and import, the effects of outsourcing on overall trade are analysed as the effects on export and the effects on import.

4. Conclusions

1. It has been established that IT outsourcing services are becoming increasingly important in every company because companies want the processes to be performed perfectly. Since not all companies can hire a professional, but want to reduce costs, they use outsourcings. However, this decision is not always beneficial as it is necessary to consider all transaction costs and factors determining the choice of outsourcing and mind that if the benefit of the service is lower than transaction costs, the company has to find other alternatives.

2. Use of information technologies reduces transaction costs of information search, storage and transaction coordination and control if customers and service providers are connected to the central electronic database.

3. Using e-commerce, transaction costs can go down because of the lower costs of 1) information search; 2) coordination and 3) payment process.

4. In the age of IT, markets all over the world are becoming more efficient because of the faster pace of information spread and transaction making. However, at the same time, IT can become the reason for market inefficiency if unreliable information is used due to the fact that decisions must be adopted immediately and there is no time to verify the data.

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SANDORIO KAŠTŲ MATAVIMAS INFORMACINIŲ TECHNOLOGIJŲ IŠORNAUDOJE

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Santrauka. Išorinaudos sandorio kaštų formavimo tobulinimas bendrovėse leidžia ne tik padidinti jų priimamų sprendimų kokybę ir veiklos efektyvumą, bet ir plečia šalies konkurencingumo tarptautinėse rinkose didinimo galimybes, darančias poveikį šalies išorinaudos apimtims. Išorinauda tapo viena iš strategijų, naudojamų verslo įmonių savo informaciniams technologijoms valdyti. Per pastaruosius keletą metų naudojimas išorinauda sukėlė mokslinės literatūros pagausėjimą. Todėl šiame straipsnyje analizuojama mokslinė literatūra, turint tikslą nustatyti svarbiausias temas bei metodikas, dažniausiai taikomas autorių ir šalių informacinių technologijų išorinaudos srityje. Šiame darbe pateikiama straipsnių apie informacinių technologijų išorinaudas, išspausdintų prestižiniuose vadybos ir verslo žurnaluose, apžvalga.

Mokslinė problema – sandorio kaštų klasifikavimas IT išorinaudoje.

Straipsnio tikslas – nustatyti sandorio kaštų informacinių technologijų išorinaudoje formavimo aspektus.

Analizės metodai: loginė, sisteminė mokslinės literatūros analizė, pagrįsta lyginamuoju ir apibendrinamuoju metodais.

Praktinis pritaikymas – straipsnyje atskleidžiami nesuderinamumai tarp išorinaudos aplinkos veiksnių ir realios išorinaudos praktikos.

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