Analysis of Increased Information Technology Outsourcing Factors

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The study explores the field of IT outsourcing. The narrow field of research is to build a model of IT outsourcing based on influential factors. The purpose of this research is to determine the influential factors on IT outsourcing expansion. A survey was conducted with 141 large-sized Slovenian companies. Data were statistically analyzed using binary logistic regression. The final model contains five factors: (1) management's support; (2) knowledge on IT outsourcing; (3) improvement of efficiency and effectiveness; (4) quality improvement of IT services; and (5) innovation improvement of IT. Managers immediately can use the results of this research in their decision-making. Increased performance of each individual organization is to the benefit of the entire society. The examination of IT outsourcing with the methods used is the first such research in Slovenia.

Keywords: Informatics, Outsourcing, Information Technology Outsourcing, ITO, Model, Business Process Management

1 Introduction

Organizations are faced every day with a more and more difficult market situation. Management should use all potential means for advancement. Business process management contains large reserves for this. One possibility by which an organization can improve performance is business process outsourcing (BPO) and information technology outsourcing (ITO or IT outsourcing). Business process outsourcing means that a business process or part of a process is transferred to an external supplier or multiple suppliers for implementation. Outsourcing means obtaining products or services from an external source. Often, the term provider or vendor is used instead of supplier, but in general this is our business partner. The model defines the presentation of reality that is too complex to be studied such as it is. The model must represent reality as closely as possible. The subject of this research study is outsourcing of informatics as an organizational unit or service, i.e. IT outsourcing; as a socio-technical system that contains technical and human components. Expressions IT and informatics are used interchangeably. The survey was conducted with large-sized Slovenian businesses.

IT outsourcing is defined as a general research area and the design of the IT outsourcing model as a specific research question based on the level of outsourcing of IT activities. Arguments, for or against outsourcing, are of great importance in decision-making. Past experience is also important. A positive attitude increases the level of outsourcing and a negative view decreases the level of outsourcing. The purpose and goal of this research study is to produce a model of outsourcing information technology.

2 Theoretical background and literature review

2.1 IT outsourcing

We are familiar with many different types of IT outsourcing. The level of outsourcing can be measured by the number of activities outsourced according to all activities or by the amount of costs according to total costs for informatics. An extreme example is full IT outsourcing by an organization.

In most organizations informatics represents a significant part of business, but the importance varies in different organizations. Depending on this, we must make decisions on the future of informatics. IT leadership challenges are (Hoving, 2007, p. 147): (1) harnessing technology; (2) providing business value; (3) managing resources; and (4) executing work. Findings by Dibbern, Chin and Heinzl (2012, p. 488)' confirm, "that a sourcing arrangement chosen by an organization is a result of the consideration of multiple types of rational choice reasoning, including efficiency and effectiveness criteria as well as social and environmental influences".

IT outsourcing must be treated as a process composed of two phases (Fink, 2010, p. 130): (1) decision phase – needed and available IT resources; and (2) implementation phase – outsourced IT resources. It has to provide four types of ability

(Sia, Koh, and Tan, 2008, p. 408): (1) robustness; (2) modifiability; (3) new capability; and (4) ease of exit. Cullen and Willcocks (2003, p. 3) stress's that ITO is (1) a strategy for managing the delivery of IT services, and (2) a transition path toward that vision, and defines eight stages of life-cycle: (1) discard myths; (2) prepare strategies; (3) choose target services; (4) design future; (5) select suppliers; (6) make transition; (7) manage the ITO; and (8) reconsider options.

2.2 Arguments for IT outsourcing

The goals that an organization wants to achieve with IT outsourcing must be clearly defined in its business strategy. Objectives must be known to all employees, and in-return, they must agree with them. If we want success, employees must identify themselves with the objectives.

The motives for deployment are different in different organizations; deployment is conditioned by many determinants. The five reasons why outsourcing has strategic meaning for CEOs are (Willcocks, 2010, pp. 63–65): (1) outsourcing impact on market value; (2) outsourcing is pervasive and growing – spending alone needs attention; (3) outsourcing can damage corporate health; (4) outsourcing can play a positive, strategic role; and (5) CEOs alone possess the crucial bargaining power.

Lacity, Willcocks and Feeny (2004, p. 139) stress: (1) better employee management; (2) redesigned processes; (3) customer-centric servicing; (4) enabling technology; and (5) new facilities. Gonzalez, Gasco and Llopis (2009, pp. 184–186; 2010, pp. 290–295) quote ten arguments for deployment: (1) focus on strategic issues; (2) increased IS department flexibility; (3) improved IS quality; (4) elimination of troublesome, everyday problems; (5) increased access to technology; (6) decrease obsolescence risk; (7) staff cost savings; (8) providing alternatives to in-house IS; (9) technology cost savings; and (10) following the fashion. Similar reasons are stated by McLellan, Marcolin and Beamish (1995, pp. 312–317): (1) changing organizational boundaries; (2) restructuring the organization; (3) mitigating technological risk and uncertainty; (4) accessing new technology; (5) improving management of IS operations; and (6) link between IT and business strategy.

There are many reasons for the deployment of IT outsourcing, but cost reduction is only one (Khan, Niazi, and Ahmad, 2011, p. 690). Organizations lose opportunities with other reasons if they are focused only on cost reduction, where cost reduction is the most important motivation (Fisher, Hirschheim, and Jacobs, 2008, p. 177; Lewin and Peeters, 2006, p. 22). Other organizations choose other strategic goals, such as (Quinn, 1999, p. 9; 2000, pp. 13–14): (1) improvement of the efficiency and effectiveness of informatics; and (2) improving the company's capacities to stay competitive. Johnston, Abader, Brey and Stander (2009, p. 37) conclude that cost is the most influential factor when deciding whether to outsource on not, irrespective of an organization's size and type. Organizations often decide for other reasons and not solely due to cost reduction, taking into account short and long-term consequences that are difficult to predict (Baldwin, Irani and Love, 2001, p. 23).

2.3 IT outsourcing expectations

We have to define determinants that are necessary for the success of outsourcing and that could be compared with outsourcing expectations. The success is valued in two ways: (1) the project implementation efficiency and effectiveness; and (2) improvement of the efficiency and effectiveness of informatics. It is valued more widely by: (1) efficiency and effectiveness of the organization; (2) efficiency and effectiveness of informatics; (3) the relationship of efficiency and effectiveness between the vendor and the buyer; and (4) the efficiency and effectiveness of the outsourcing project implementation. The cost of informatics is a relatively small part of the total organization's costs; as such, if we implement total IT outsourcing, the influence on business, in many cases, is not significant. It is difficult to distinguish IT outsourcing savings from other causes, e.g. the global economic situation. Gorla and Lau (2010, p. 91) evaluate, that satisfaction with IS outsourcing is only 33% and that 78% of projects are discontinued either by switching vendors or by back-sourcing. In-house IT capabilities are associated with IT outsourcing success (Aubert, Houde, Patry, and Rivard, 2012, p. 20; Dutta, Gwebu, and Wang, 2011, p. 240).

The seven characteristics of IT offshore outsourcing projects that differentiates success and failure (Rottman and Lacity, 2008, pp. 266–271) are: (1) projects that engage one large offshore supplier are rated higher than projects that engage one small offshore supplier or multiple suppliers; (2) projects with some offshore suppliers employed onsite are rated higher than projects with all suppliers employed offshore; (3) projects with greater-value contracts are rated higher than projects with lesser-value; (4) long-term projects are rated higher than short-term; (5) some organizational units' projects are rated differently than other organizational units; (6) development and maintenance/support projects are rated equally; and (7) recent projects are rated higher than older ones.

Some authors indicate a positive, others a negative, and thirdly a neutral impact of outsourcing on the IT efficiency and effectiveness in organizations. Hirschheim and Lacity (2000, p. 105) note in their study that half of the organizations achieve cost savings, whereas half do not. Similar conclusions are found by Bengtsson and Dabhilkar (2009, pp. 252–254) who conclude that some authors show significant positive effects, while others do not and that investments into technology and organization contribute more towards efficiency and effectiveness than business process outsourcing. Gilley and Rasheed (2000, p. 788) conclude that there is no connection between business process outsourcing and an organization's performances. Downing, Field and Ritzman (2003, p. 88) have a positive opinion about IT outsourcing and they conclude that outsourcing information systems can create lower overall process costs and may lead to superior overall process performance. In sharp contrast to common belief, Broedner, Kinkel and Lay (2009, p. 127) state that outsourcing has a strong negative impact on an organization's labor productivity.

Aron and Singh (2005, p. 135) summarize in their study three reasons for the success or failure of business process outsourcing (n.b.: half of the attempts do not reach financial

expectations): (1) choosing the right processes; (2) control both the operational and structural risks; and (3) match organizational forms to needs. Shi (2007) lists client-side problems, which are: (1) cost-saving mirage; (2) lack of process model maturity; and (3) lack of understanding or consensus of target business model. On the other side, we have vendor-side problems, which are: (1) competence gap; (2) heavy turnover of key personnel; and (3) weak security practices or requirements. And finally, reasons for failures or difficulties are often inside client-vendor relationships, which are: (1) lack of precise and detailed project specification; (2) language and culture misalignment; (3) knowledge transfer difficulties; (4) process calibration difficulties; (5) incompatible pace of technology change; (6) incompatible architectural style; and (7) loss of continuity due to employee shuffles. (p. 29)

2.4 IT outsourcing models

The model is a simplified description of the real situation; it is important, that the model is most similar as possible to reality. Yang, Kim, Nam and Min (2007, p. 3771) define a business process outsourcing decision model based on three determinants: (1) expectation – cost savings, focus on core competence, and flexibility; (2) risk – information security, loss of management control, and morale problems; and (3) the environment – vendor's service quality, market maturity, and other firms' outsourcing decisions.

The outsourcing model from a client's perspective is composed of three factors (Khan and Fitzgerald, 2004, p. 44): (1) organizational factors – decision makers/initiators, SWOT issues, implementations, and re-engineering potential; (2) technological factors – internal organizational capabilities, key requirements and usage, and support and maintenance; (3) process factors – in depth specifications/capture full requirements, project management – by meeting strict deadlines, contract, trust & security, communication, and standard quality; and (4) geographical/environmental factors – domestic/overseas, resource/expertise, standard quality, infrastructure capability – ability to network, trade law, political stability, culture adaptability, and market entry advantage.

Barthélemy and Geyer (2005, p. 535) highlight important internal determinants for decision making on IT outsourcing as: (1) IT activity specificity; (2) IT department size; and (3) IT internal organization (profit center); and as external determinants, which are: (4) institutional environment; and (5) sector IT intensity. Configuration can be described using seven parameters (Cullen, Seddon, and Willcocks, 2005, p. 362): (1) scope grouping; (2) supplier grouping; (3) financial scale; (4) pricing framework; (5) contract duration; (6) resource ownership; and (7) commercial relationship. Han, Lee and Seo (2008, p. 32) propose a relationship based model: (1) relationship effecting resources – technical and managerial IT capability, organizational relationship capability, and vendor management capability; (2) relationship formation processes – information sharing, communication quality, and collaborative participation; (3) relationship outcome – trust and commitment; and (4) performance – outsourcing success.

Different authors have used different models for studying IT outsourcing. Alvarez-Suescun (2007, p. 767) used three variables for model design: (1) IS technical skills; (2) IS implementation capability; and (3) strategic contribution of IS. Lee (2001, p. 326) has tested the effectiveness of outsourcing based on: (1) organizational capability; (2) knowledge sharing; and (3) partnership quality. Gonzalez, Gasco and Llopis (2010, pp. 291–296) have created a model based on: (1) outsourcing reasons; and (2) outsourcing risks. Gorla and Lau (2010, p. 96) have made a model based on: (1) risks; and (2) past negative experiences.

3 Methodology

3.1 Data collection and analysis

The questionnaire was created based on relevant literature. The validity of the questionnaire was checked at two levels: (1) the questionnaire was reviewed and evaluated by two experts from the field of management of information systems; and (2) after receiving 80 questionnaires, a pilot survey was conducted, with which the validity and intelligibility of the questions were determined.

The questionnaire was sent to 484 organizations by standard postal mail and was addressed to the head of IT. The envelope contained the questionnaire, a cover letter, and a prepaid self-addressed envelope. The cover letter emphasized that the questionnaire was anonymous to the respondent and the organization. The final questionnaire results also were offered to the respondents. At the first stage, 92 responses were received. To obtain a higher response rate, another cover letter with the questionnaire was resent to all the organizations that did not respond. After the second call, a total of 141 questionnaires or a 29% response rate was achieved and served as the sample for this research study.

The population was organizations that had more than 150 employees. Large-size companies were chosen using the criteria of the average number of employees in the financial year, the amount of net turnover, and asset values.

Statistical data analysis was conducted with binary logistic regression. Statistical significance is usually defined at 0.05 i.e. at 5%, and in certain circumstances at 0.01 (1%) or 0.001 (0.1%) and denoted by p, p means a two-tailed test i.e. p (2-tailed).

3.2 Measuring instrument

The first question examined whether the organization would expand IT outsourcing or keep it at the same level in the future. This question is used as a dependent variable in logistics regression analysis. This is a binary variable (0 – same level, 1 – increased level). The second question was with regard management's support for IT outsourcing. Respondents responded with a binary response: 0 (low support) and 1 (high support). The third question was used to determine the level of employees' knowledge on IT outsourcing in their organization. Two responses were possible: 0 – insufficient and 1 – sufficient (binary response). In addition, respondents were asked five questions regarding the experience of deploy-

ment of IT outsourcing: (1) performance – improvement of efficiency and effectiveness; (2) costs – IT cost reduction; (3) delay – shortening time of IT services; (4) quality – quality improvement of IT services; and (5) innovation – innovation improvement of IT. All variables are binary variables, where 0 means low and 1 is equal to high. All seven variables were used in binary logistic regression as independent variables, i.e. predictors.

The demographic data of respondents is summarized in Table 1.

Table 1: Demographic Data of Respondents

Question	Response	
Function	**Head of IT**	58.6%
	Other function or position	16.4%
	Head of department in IT	12.1%
	Director of business function	10.7%
	CEO	2.1%
Education	**II. Bologna Cycle**	49.6%
	I. Bologna Cycle	25.2%
	III. Bologna Cycle	14.4%
	Secondary Education	10.8%
Gender	**Male**	85.6%
	Female	14.4%
Age (average)		41.8 years
Seniority (average)		18.2 years

4   Results and discussion

Descriptive statistics was used to determine the correlation among independent variables. Nonparametric Spearman's correlation coefficient (r_S) was determined to be adequate as there were only binary variables. As can be seen in Table 2 all cor-

relations were positive; most correlations have approximately a medium effect (+0.3). Stronger correlations were among Quality, Performance, and Delay. Perfect collinearity did not exist among predictors. Variance inflation factor (VIF) is less than 2.38 for all variables. This test confirms that multicollinearity is not problematic among variables.

IT function can be executed in an organization, can be partially executed by the supplier, can be fully executed by the supplier, or the organization has no such activities. For the purposes of this research study, it is important to examine whether IT outsourcing level will be increased or not. This is the dependent variable.

The first factor represents top managers' support of IT outsourcing, which is crucial to success. The second factor represents level of knowledge on outsourcing. This is not important only among managers, but also among all employees. The third factor describes how outsourcing increase overall performance (i.e. effectiveness and efficiency through deployment). To achieve this goal, we must utilize all available resources. The fourth factor includes the importance of cost-cutting. Many organizations estimate that costs are too high for informatics and that they need to be lowered to maintain competitiveness. The fifth factor is delay. Many organizations expect that delay of services decrease with more competent suppliers' staff. The sixth factor represent quality of IT services and should increase with supplier cooperation. The last factor represents the innovation improvement of IT. IT staff can be more focused on their core business.

Table 3 shows only five factors that have a statistically significant impact on the model. These are: (1) management's support; (2) knowledge on IT outsourcing; (3) improvement of efficiency and effectiveness; (4) quality improvement of IT services; and (5) innovation improvement of IT. The remaining two factors: (1) IT cost reduction; and (2) shortening time of IT services, have a lesser impact and were not statistically significant; as such are not shown in Table 3. However, being aware on the significance of these two factors is also very important. Quality improvement of IT services is most important for the decision that the organization will increase IT outsourcing (odds ratio i.e. exp(B) = 19.10). The basic model is improved by adding five independent variables i.e. five predictors, value of –2LL is reduced from 115.64 to 70.90. The

Table 2: Spearman's Correlation Coefficients Among Independent Variables

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
(1) Management						
(2) Knowledge	0.32**					
(3) Performance	0.29**	0.34**				
(4) Costs	0.20*	0.16	0.44**			
(5) Delay	0.40**	0.30**	0.59**	0.54**		
(6) Quality	0.26**	0.35**	0.67**	0.39**	0.65**	
(7) Innovation	0.22**	0.22**	0.46**	0.37**	0.43**	0.48**

Notes: * $p < 0.05$ (2-tailed); ** $p < 0.01$ (2-tailed)

Table 3: Regression Model

	B (SE)	95% CI for Odds Ratio		
		Lower	**Odds Ratio**	**Upper**
Constant	–3.41 (0.62)***			
Management	2.17 (0.71)**	2.19	8.73	34.76
Knowledge	1.34 (0.65)*	1.12	4.03	14.45
Performance	2.43 (0.86)**	2.12	11.34	60.53
Quality	2.95 (0.92)**	3.18	19.10	114.82
Innovation	2.41 (0.84)**	2.17	11.13	57.20

*Notes: R^2 = 0.57 (Cox and Snell), 0.76 (Nagelkerke); Model $\chi^2(5)$ = 111.87, $p < 0.001$; *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$*

total percentage of correct predictions of the model is 87.3%. Nagelkerke R^2 = 0.76 imitates the coefficient of determination R^2 multiple regression and can be interpreted as the percentage of explained variance.

Only five factors in the final model were retained. This model can explain 76% of variance. Organizations often decide for deployment or expansion of outsourcing based on factors beyond IT outsourcing. This is especially present in times of economic crisis. Management, for example, decides on outsourcing to reduce the number of employees. In this case, the arguments for and against outsourcing lose their importance. Other management may decide otherwise in exactly the same situation. Due to the crisis in which we want to preserve as many jobs as possible, we decided for job transfer from an external supplier back to the organization, thus reducing the volume of outsourcing. IT outsourcing is sometimes politically motivated and is not based on real needs. The points of view of business executives and IT executives are often different and sometimes detrimental for outsourcing activity (Chakrabarty and Whitten, 2011, p. 812).

Interestingly, respondents did not select cost-reduction as the most important factor. Many authors say that sole cost reduction (cheaper informatics) is not sufficient, but it is necessary through innovation (better informatics) to achieve higher added value for customers, better performance of informatics and the organization (Weeks and Feeny, 2008, pp. 132–135). Also Linder (2004, p. 52) stresses that the organization needs to use IT outsourcing to achieve strategic goals and not for cost reduction only, which is only one benefit. This conclusion also is confirmed in this research study.

The outsourcing of information technology must be efficient and effective that can be evaluated through costs, delay, quality, human resources and environment. We expect that it will reduce informatics costs, will increase IT responsiveness, will improve the quality of IT services, will increase employee satisfaction, and that employees will have better working conditions. Many authors draw attention to the phenomenon of failed ITO deployment (Espino-Rodríguez and Padrón-Robaina, 2006, p. 64). This means, that there are many opportunities for improvement.

5 Conclusions

The level of IT outsourcing will increase in Slovenia in the future. Five factors were confirmed in this study that significantly influence future decisions: (1) IT outsourcing management's support; (2) employees' knowledge about IT outsourcing; (3) improvement of efficiency and effectiveness as a result of IT outsourcing; (4) quality improvement of IT services caused by IT outsourcing; and (5) innovation improvement of IT because of IT outsourcing. An interesting finding from this study was that (1) IT cost reduction and (2) shortening time of IT services, were not significant factors. Organizations decide on outsourcing based on several reasons and the most important is not cost reduction in informatics.

The Slovenian economy is lagging behind the rest of the European Union by over 10 years, maybe even 20 years. In the developed world the outsourcing of information technology has reached a maximum and it is to be expected that this trend of expansion would be reversed. In Slovenia, research concerning this area is still relevant namely because of this delay. The volume of outsourcing will continue to increase. This study is the first such to be carried out in the Slovenian territory and represents a contribution to science in this area. Managers can immediately use the results of this research study in their work. The contribution of this study to society is also important. From the national-economic point of view it is important that all or most organizations that choose IT outsourcing are successful.

In the model proposed, we included the importance of arguments for and against outsourcing, positive and negative past experiences, and other factors. These are some suggestions for further research.

The limitations of the study are that the study was limited to the Slovenian area, only large-sized organizations were included in the sample, and only companies were included.

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Analiza faktorjev povečanja zunanjega izvajanja informatike

Študija raziskuje področje zunanjega izvajanja informatike. Kot ožje raziskovalno področje definiramo izgradnjo modela na osnovi vplivnih faktorjev. Namen raziskave je ugotoviti, kateri faktorji vplivajo na razmah zunanjega izvajanja informatike. Naredili smo anketo med 141 največjimi slovenskimi organizacijami. Podatke smo statistično obdelali z binarno logistično regresijo. Končni model vsebuje pet faktorjev: (1) podpora najvišjega managementa; (2) znanje o zunanjem izvajanju informatike; (3) povečanje uspešnosti in učinkovitosti; (4) povečanje kakovosti storitev informatike in (5) povečanje inovativnosti informatike. Izsledke raziskave bo menedžment v organizacijah lahko takoj uporabil pri svojih odločitvah. Večja uspešnost vsake posamezne organizacije pomeni pridobitev za celotno družbo. Ta raziskava zunanjega izvajanja informatike je z uporabljenimi metodami prva tovrstna študija v slovenskem prostoru.

Ključne besede: informatika, zunanje izvajanje, zunanje izvajanje informatike, ITO, model zunanjega izvajanja informatike, menedžment poslovnih procesov