

Analyzing the Impact of Interaction Processes on the Relationship Between Firm 's Capabilities and Outsourcing Success of Information Technology (case study: higher education centers of Isfahan)

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ABSTRACT

Nowadays, firm have realized the importance of information technology as an essential tool for the success of business. Accessing the applicability of information technology might be the main expectation of the firm for outsourcing. By outsourcing, firms can have access to advanced technologies and use external sources for their goal. The aim of this study is to analyze the impact of interaction processes on the relationship between firm 's capabilities and outsourcing success of information technology in Isfahan centers for Higher Education.

Key words: outsourcing, firm capability, interaction processes, information technology

Introduction

Nowadays in the developing world, immediate changes in business has obliged major managers to adopt strategies which focus both on the current conditions of the firm and on investment in performances which improve competition advantage for conditions of that firm. One of the strategies is to focus on the main competence and assigning much of the activities to external sources (outsourcing). Outsourcing is a simple and economic executive tool which gradually becomes more useful. Although business and industrial managers try to adopt outsourcing strategies, but practically they aim to be able to use outsourcing more effectively in order to improve competition and performance in market.

Despite continuous increase in outsourcing performance of information technology in the world, a remarkable number of outsourcing transactions have faced with either failure or serious problems. This is due to the lack of systematic guidance regarding how to negotiate about contracts and how

to develop further contracts (Kong, 2012). Till now, outsourcing issue has been proposed and evaluated in a general way and no specific pattern has been presented for outsourcing the services and its relation to firm 's capabilities. Although business and industrial managers try to adopt outsourcing strategies, but practically they aim to be able to use outsourcing more effectively. In most of universal corporations either big, average or small ones, it is considered as one of the strategies for decreasing costs and increasing incomes. Improvement of the relationship between firms has been suggested as the best way to face this challenge. There are two basic ways for management of outsourcing transactions: characteristics of contract (Brown & Magel, 1994) and interaction ability (Kouh, 2004). Evidence indicates that outsourcing strategies, if well defined, can improve all the strategies of the firm (Fini, 2005). If the outsourcing corporation has firm 's capabilities in specific fields, we can be hopeful that outsourcing performance will be successful. One of the most important points taken into account in outsourcing performance, is firm abilities and capabilities which outsource their activities. Although information technology outsourcing has had remarkable benefits for firms, but practically there are numerous big failures in regards with outsourcing. Despite the awareness of failure potentials, information technology outsourcing industry is still developing (Kallen, 2014). It is important to mention that outsourcing information technology projects have faced with failure in most cases; for instance, in a study ,managers of information technology have declared 33 % satisfaction of outsourcing of information technology services in comparison with other outsourcing projects in which there has been 70- 80% satisfaction. According to reports of Gartner group, 73% of upper average corporations outsourced their business process last year. Outsourcing is the

appropriate mean for firms in order to decrease cost, focus on the main processes, improve proficiency, decrease the time span between idea and marketing and increase the competition advantage of the whole corporation.

In cases when the possibility of failure in outsourcing activities is high (because of incompatibility with firm's capabilities), one can inform the decision-makers and prevent from losing firm sources. One can also have successful outsourcing through improvement of firm's capabilities by the abilities of external corporations.

Due to the sensitivity of information technology in firms, the main issue in the current research is to identify the degree of effect of interaction processes on the relationship between firm's capabilities and success of outsourcing future activities. Since such activities have specific importance and value in knowledge-based institutes such as universities, identification of the degree of effect of interaction processes on outsourcing success of such performances can be stated as a preface for increasing rate of success of outsourced information technology performances. According to the discussions, the research hypotheses can be categorized as follows:

- First hypothesis: firm's capabilities have positive effect on interaction processes.
- Second hypothesis: interaction processes have positive effect on outsourcing success.
- Third hypothesis: firm's capabilities have positive effect on outsourcing success.

LITERATURE REVIEW

Theoretical Background

Outsourcing

Outsourcing is defined as the transference of non-strategic processes to out of firm and focusing on internal key processes (MousaKhani, 1386).

The processes of transferring some performances and the internal decision-making responsibility to out of the corporation (Chase, 2004:12).

If outsourcing firms and contractor can achieve the goals they follow through outsourcing the performances, outsourcing processes is successful. (Barthelemi, 2005:14).

Firm's Capabilities

Firm's capabilities refers to integral parts of knowledge and processes related to control, coordination and social interaction of firm and external individuals (clients, suppliers and so on) (Dosi, Faillo & Marengo, 2003:10). The general agreement is that corporations cannot focus on just one specific capability. However, coordination of different capabilities is necessary. For instance, development of different firm's capabilities is related to marketing opportunities effectively. All capabilities together are the base of high efficiency and business success (Hauknes, 2000:43).

Information Technology

Information technology is a collection of hardware, software, communication, systems, automation, working stations. In short, information technology deals with issues such as using electronic computers and software so that transformation, saving, protection, processing, transference and information recovery will be performed in a safe manner.

(American Association of Information Technology). Information technology is used as a tool for acceleration and development of other businesses (Kern, 2000:147).

Interaction Processes

In firm literature, the word interaction is presented in three levels of interpersonal, intergroup and inter-firm interaction. In outsourcing, interaction between firms is of the most importance. Such interaction is defined as physical, financial, information, human and communicative transaction which firms perform as a result of common goal and interest (Lander, 2004:54).

Empirical Background

Rahnavard & Khavandkar (1387) in their own research under the title of Knowledge Sharing on Success of Outsourcing of Information Technology Services, have explored information technology which is one of the bases of outsourcing. Findings of the research indicates that, knowledge sharing in light of postural variables influences the success of outsourcing strategy. In other words, the relationship between knowledge sharing as an independent variable and outsourcing success as a dependent variable, on one hand is influenced by a mediator variable named share ability. On the other hand, firm's capabilities appear as modulator variable in this regard. Thus, outsourcing information technology services is successful if each party shares knowledge through share ability relation and endeavors to apply obtained knowledge in their own firm by improving their firm's capabilities.

Holger and Henli (2011), have considered the relationship between outsourcing international services, internal outsourcing, interest and innovation by using data in an industrial center. In the current research, the positive effect of outsourcing international services on innovative activities in industrial centers is taken into account. Such a positive effect can also be observed in internal outsourcing. But it is less. They have also concluded that outsourcing international services has positive effect on profitability. Different characteristics and the analyses of variables of the research can be generalized in other outsourcing areas.

Han (2013) in his research has considered the direct effects of information technology capabilities of corporations which provide information technology services and clients on success of outsourcing information technology. Results of this research indicates that information technology capabilities of corporations providing information technology services and clients are important factors in outsourcing success and full relationship between them is distinctively effective on outsourcing success. The degree of the relationship between corporations which provide information technology services and seller when the two parties have the same level of technology capabilities, is higher in comparison with cases when the level of their technology capability is different.

Kong (2012) has considered the effect of interaction and contract on outsourcing success on two cases in China and Hong Kong. The results of the analyses determines the dimensions of interaction and contracts and indicates that information technology outsourcing success is mainly evaluated by technological interest rather than by strategic and economical interest of firm; while, strategic and

economical interest is the result of the interaction of information technology outsourcing.

Lee & Kim (2010) have done a research on effective variables on firm value (value for money) which may change as a result of outsourcing. In this study, variables of duration of contract, outsourced operations, location of outsourcing and control variables were known to be effective on dependent variable. Control variables in the research consists of past performance, impact of marginal variables, economic condition and ownership of supplier.

Yang Jin Kim (2013) has analyzed the effect of characteristics of contract and Relationship strength on outsourcing performance of information technology. The data were collected from 143 client companies of information technology outsourcing and were analyzed through PLS. The results indicate that characteristics of contract and Relationship strength are effective on governance effectiveness of firm and characteristics of contract specification is considered to be more effective than relationship strength. governance effectiveness in turn mediates the effect of contract specification and relationship strength and three sub-dimensions of outsourcing performance: includes cost efficiency, performance improvement and finally the overall satisfaction. The effects of all the variables were positive and significant.

Conceptual model of research

In this study according to the presented literature, variables consists of :Independent variables: firm ' capabilities, interaction processes. Dependent variable: outsourcing success Mediator variable: interaction processes Hidden variable: technical capabilities, interaction capabilities, administrative capabilities of contractor, interaction quality, collaborative partnership, communication sharing.

RESEARCH METHOD

The current research is applied in respect to its purpose and is sectional survey in regards with data collection time because the data related to a specific time are supposed to be collected. According to the characteristics, the descriptive subject is causal .The necessary data for testing and analyzing the research hypothesis were collected through a

questionnaire. The questionnaire consisted of 37 specialized questions. In order to explore the research variables, 5-point Likert scale is used. The questions are scored by points 1 to 5.

Sample Population

The sample population of the present research consists of all the employees who use the information technology service of the university under study whose total number is about 418. Sampling is performed on the available samples. The available samples are categorized according to gender. Sample size was estimated 200 people based on the sampling formula of Cochran.

$$n = \frac{Nt^2pq}{Nd^2+t^2pq} = \frac{418*3.84*0.5*0.5}{418*0.0025+3.84*0.5*0.5} = 200$$

Table 1. population and number of the sample

gender	Number in community	Number in sample
female	80	66
male	315	129

DATA ANALYSIS

The statistical method employed in this study is structural equation. Structural equation modeling has been a common instrument in management, medical and social sciences in the last two or three decades. According to the points discussed in this section, the impact and lack of impact of the aforementioned factors is analyzed through SMART-PLS, and indices of factor assessment and path coefficient of factor determination are also analyzed.

variables have reliability. The value of composite reliability (CR) in the column of table 2 for all the variables is more than 0.70 and thus all the variables have composite reliability(Chen, 1997). variables have reliability.The value of composite reliability (CR) in the column of convergent validity is approved (Fornel & Larker, 1981).

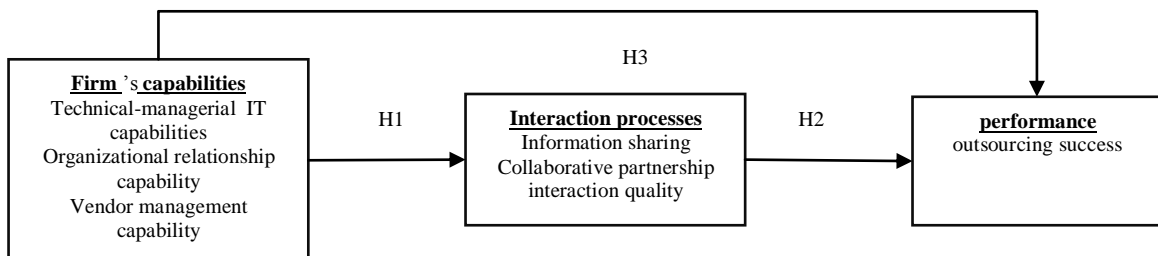


Figure1. conceptual model of research

Table2. convergent validity and reliability of measurement instrument

Construct	Reagent number	Range of loading factor	Coefficiency of Cronbach alpha	Composit reliability	Average of extracted variance	Standard error
Firm capabilities	16	0.553-0.884	0.921	0.870	0.751	0.022
Interaction processes	13	0.636-0.872	0.938	0.903	0.683	0.061
outsourcing	8	0.621-0.863	0.876	0.838	0.803	0.102

Reliability of Measurement Model (external model)

According to Anderson (1998), if the value of Cronbach alpha is larger than 0.70 the reliability of variables of measurement model is approved. Based on the results of table 2, the value of all the Cronbach alpha is larger than 0.7, and consequently the Analyzing the Validity of Measurement Model (external model)

Convergent Validity

If the minimum value of the extracted variance average (AVE) equals to 0.5, convergent validity is approved (Fornel & Larker, 1981). Based on the results of table 2 the convergent validity of the model is approved. Because the values in column AVE in table 2 are larger than 0.5.

Table 3. Correlation of latent variables

	Firm's capabilities	Interaction processes	outsourcing
Firm 's capabilities	0.866		
Interaction processes	0.805	0.826	
outsourcing	0.633	0.658	0.896

Analyzing the Validity of Measurement Model (external model)

Divergent Validity

It is analysed based on Fornel & Larker criterion. As it is observed in table 3 (table of the correlation of latent variables) the root mean for each construct is larger than the value of its correlation with other constructs and as a result, the divergent validity of the model is approved (Fornel & Larker, 1981).

According to the aforementioned issues and the results obtained from the output of SMART-PLS software in table 2 and 3 it is observed that the measurement instrument has validity (convergent, divergent) and reliability (loading factor, coefficient of composit reliability, coefficient of Cronbach alpha).

Analyzing Structural Model (internal model)

According to the results obtained from auto driver algorithm in software, which can be seen in table 4, the statistical value of t , beta and significance level for each of the research hypothesis is indicated and consequently, according to the significance level for p<0.01, the value of the t-test must be at least 1.96 and for the significance level

for p<0.005 the value of t-test must be at least 2.53 and for the significance level for p<0.001 the value of 3.32 for t-test is adequate. Therefore all the hypotheses of the model in the significance level of p<0.001 are approved.

The data obtained from field study were conducted in SMART-PLS software and according to the graph 2 the results were obtained.

According to the output of SMART-PLS software, information technology capability with the value of (t= 14.289 & β= 0.342) and organizational relationship capabilities with the value of (t = 16.141 & β= 0.342) and vendor management capability with the value of (t= 12.789 & β = 0.426) constitute Firm ' s capabilities among which vendor management capabilities has the most positive effect on firm 's capabilities.

information sharing with the values of (t = 13. 746 & β = 0.382), communication quality with the values of (t = 0.598 & β = 19.942) and collaborative partnership with values of (t = 6.470 & β = 0.085), constitute interaction processes among which information quality has the most effect on interaction processes. Analysis of each of the relationships which are indicative of research hypothesis are summarized in table 4. According to the hypotheses defined in the structural model, the hypothesis H1 with the values of (β = 0.805) and (t= 34.074) is acceptable in the significance level of p< 0.00. Therefore firm ' s capabilities has direct, positive and significant effect on interaction processes. Hypothesis H2 with the values of (β = 0.422) and (t =4.229) is acceptable in the significance level of p<0.001. Thus interaction processes has direct, positive and significant effect on outsourcing.

Hypothesis H3 with the values of (β = 0.293) and (t = 10.005) is acceptable in the

significance level of p<0.001. Nevertheless, firm 's capabilities has significant, positive and direct effect on outsourcing.

Table 4. summary of the results obtained from hypotheses testing

Hypothesis	Path coefficient (β)	t- test	Approved / disapproved
Firm ' s capabilities	***0.805	34.074	Approved
Interaction processes	***0.422	4.229	Approved
Outsourcing success	***0.293	10.005	Approved

*P < 0.05 **P < 0.001 ***P < 0.001

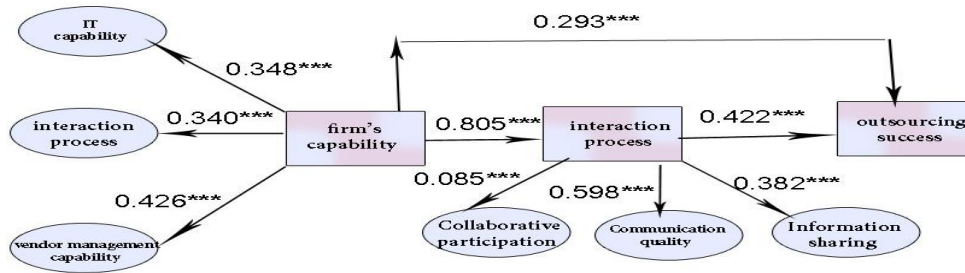


Figure 2. Path coefficient model

Table 5. Model analysis index

Construct	Determination coefficient (R ²)	Commonality index
Interaction processes	0.648	0.940
Outsourcing	0.463	0.950

Model Analysis Index (GOF)

According to the commonality index and determination coefficient in table 5, goodness criterion of analysis in the model is 0.724 which is obtained through the calculation of geometric mean of the average of determination coefficient (R²)

and average of sharing. Also the values of determination coefficients by Chin that is 0.19 , 0.33 and 0.67 are described respectively as weak, average and remarkable, while in table 5 the values of (R²) is more than larger than 0.19 and consequently the ability of the model in describing the dependent structure is remarkable. Values of table 5 also indicate that firm’s capabilities has the ability of forecasting 68 percent of changes in interaction processes and interaction processes has the ability of forecasting 46 percent of changes in outsourcing success.

Conclusion

One-way communication and effect (from huge firms toward low levels) is the basis of the presented model in the study. Results of the study indicates that there are significant relationship between variables of the research. Related analyses were conducted through PLS software in this research and the research model was approved by using this software.

Firm’s capabilities has positive effect on interaction processes. Results of this hypothesis corresponds with the researches of Han (2013), Rahnavard & Khavandkar (2008) and Han Lee Sou (2008). Technical and managerial IT capabilities are the main indices to understand the development process of outsourcing relationship with corporations which provide information technology services. In fact, among the hidden variables of firm ’s capabilities, managerial capability has the first rank in regards with impact and information technology capability has the second rank and relationship capabilities has the third rank. With increasing firm ’s capabilities including technical capabilities, vendor management and firm communications, interaction

processes increases and with its decrease, this component decreases too. Han, Lee & Sou(2008) evaluated the impact of firm’s capabilities on interaction processes as almost average. The results of Han’s study shows that among hidden variables of firm ’s capabilities, information technology capability has an unremarkable effect on interaction processes but the effect of other items is remarkable. Interaction processes has positive effect on outsourcing success. The results of this hypothesis corresponds with findings of Kong(2012), Han et al (2008), Yang Jin Kim(2013), Rahnavard (2008), Lee & Kim (2010). In the model under study, the interaction processes includes information sharing, communication quality and collaborative partnership. The findings indicates that among hidden variables of interaction processes, communication quality has the most effect and information sharing and collaborative partnership have the next ranks. The hypothesis also indicates that we can ensure outsourcing success through interaction processes and reach a higher performance by developing mutual interaction and communication. Findings of Han, Lee & Sou(2008) show that interaction processes has a weak effect on relationship strengthening and outsourcing success. The researcher evaluated the effect of this factor in comparison with other factors such as interaction processes as weak. The third hypothesis indicated that outsourcing success can be reached with the increase of firm capabilities. The results of this hypothesis corresponds with findings of Han (2013), Han et al (2008). We can reach outsourcing success just by establishing friendly relationship among firms and corporations providing information technology services, cooperation of such corporations in doing their duty and sharing effective information in the processes of doing their duty.

SUGGESTIONS

Firm’s capabilities technical-managerial IT capabilities, managerial capabilities of contractor and firm communication capabilities so that the improvement of such capabilities in

the firms leads to a better relationship with corporations providing information technology services which finally results in outsourcing success. improvement of technical capabilities leads to the improvement of interaction process which firm managers should take into account and speed up the improvement of the interactions by increasing technical-managerial IT capabilities. Also using information technology as the main strategic core and correspondence of strategy of corporations providing information technology services with organizational strategies and having processes to manage the contracts of outsourcing projects in each firm lead to the interaction improvement and finally outsourcing.

On time relationship between firm and corporations providing information technology services results in the improvement of outsourcing. Communication quality is one of the dimensions of interaction processes. Since there is a considerable difference between expectations of firms and corporations providing information technology services and current condition, there should be a plan to meet the needs of both parties in order to bridge the gap. Sharing information and knowledge between firm and corporations providing information technology services results in secured communication. Collaborative partnership is an interaction processes factor. If firms and corporations providing information technology services cooperate with each other and make collaborative decisions to solve the problems and adopt their needs, the relationship between them will be more secure which can be effective on outsourcing success.

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