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Original Article

Identification of Risk Factors in IT Projects Outsourcing; A Survey in IT Companies Located in Tehran

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ABSTRACT

Outsourcing in many of large, medium and small scale international companies is considered as a solution to reduce costs and increase incomes; it doesn't imply that increase in outsourcing level isn't involved with any problem. Although companies benefit from outsourcing to economize their costs (cost saving), there are unsuccessful outsourcing experiences which cause lack of achievement of the expected service level. Despite such issues, companies prefer to outsource their information technology (IT) services. The purpose of this article could be stated as identifying effective factors which cause IT companies face risks during outsourcing of their IT projects. Such objective is investigated using meta-synthesis method and prioritized factors. Besides, their influence level is determined using questionnaires. In the present study, effective factors influencing risk of IT projects outsourcing are extracted. Main variables consist of: contract, costs, security, legal factors, new technologies and innovation, Contractor exclusive issues and finally client items. These variables are validated by experts of this field then distributed throughout the companies which have ranked primarily by the Informatics council. They have been given (hold) the exploitation permit from previous industrial and mines ministry. Concerning descriptive statistics, among the 39 factors, the factors which were given the highest priority are as follow respectively: First of all, deviation from the contract terms and conditions. Second, insufficient allocation of time to execute the contract, and third, contractor poor performance, Forth, costs due to undelivered items and Finally using the contracts which aren't prepared based on a specific procedure.

Keywords: Risk, Risk Management, Outsourcing, IT Projects Outsourcing.

Introduction

In facing an ever-increasingly competitive and changeable environment, organizations are required constantly managing their resources and focusing on core business so as to maintain competitive advantages. To meet this requirement, more and more organizations resort to information technology (IT) as a solution for achieving the informationization management of resource and business In recent years, IT outsourcing has been extensively accepted by various organizations This is because IT outsourcing has many potential benefits: cost saving, improved efficiency, increased flexibility and so on (Fan, et al., 2012). In today's global economy, outsourcing has become a very common phenomenon. Many large organizations have outsourced some or all of their IT function (Dhar and Balakrishnan, 2006).

There are some reasons which lead the active IT companies to turn into outsourcing, these reasons consist of: cost reduction, focusing on resources. Next prevalent reason (common cause) is stated as strength point and the competitive advantages. The IT outsourcing have got remarkable financial and operational advantages (Brandas, 2010). It should be considered that these advantages won't be accessible, unless the effective factors which put IT projects at risk in the outsourcing procedure are accurately defined and managed. Inconsideration of the precise recognition of outsourcing risks, its expected benefits will be wiped out (Gewald and Dibbern, 2009). Outsourcing practice always faces many risks and hazards. If these risks are not considered, it will ruin all expected benefits.

Therefore in this research, we are trying to identify the effective factors which are vital in the decision process of IT projects outsourcing because they cause risks. After the factors identification and their prioritization, we attract IT project managers' attraction to influencing factors realized in this article to make the accurate decision on outsourcing projects.

Literature Review

IT outsourcing entails risk that may lead to undesirable consequences, *e.g.*, costly contractual amendments, shirking and opportunistic bargaining, disclosure of commercial secrets and fraud. Thus, a significant risk management effort is required to adeptly steer IT outsourcing operation especially, risk factor identification is the base of whole risk management. By risk factor identification, various risk factors that may influence IT outsourcing operation are uncovered to help decision makers capture the source of IT outsourcing risk (Fan, et al., 2012). Software project risk is an uncertain event or condition with negative consequences on a software project (Xiaosong, et al., 2009). The research of IT outsourcing has examined multiple aspects of the phenomena, from reasons why organizations outsource, to long term on sequences of outsourcing from both client and supplier perspectives. The main aspects approached are: (1) motivations of IT services outsourcing, (2) the relationships between client and IT services provider, and (3) internal and external factors impacting the decision make process (Brandas, 2010). Summarizing the importance of IT outsourcing risk analysis from previous studies, the following questions may arise**:**

What are the risks of IT outsourcing?

Which risk factors does influence outsourcing success more intensively?

Risk Concept

Risk definition derives from probability theory. The casino plays and practices have affected probability concept and risk theory development (Avazkhah and Mohebbi, 2010). Barki (1993) debates, risk has got two dimensions consist of, first, probability which relates to an unwanted event and second, it's consequences which are relevant to human (Barki, *et al.,* 1993). In business dictionary (2011), risk is called probability, risk of disservice, responsibility, lost, negative occurrences due to external and internal vulnerabilities which can be deactivated by the some preventive actions (Business Dictionary, 2011).

Risk Definition

Theoretically, risk is a deviation which prevents us to reach the desirable goal. Risk is defined as a probability criterion and the severity of destructive effects (Barki, et al., 1993). Risk is known as uncertainty, unknown situation, future unreliability and probability. Risk is an inseparable part of any management decision steps. The process of service and new product development, investing on them and execute them are usually considered as the common pattern to explain risk(Gupta, 2003; Huff, 2002).Bali and Rivard (2003) inset the risk as a set of three parameters, possible situation, consequence of any situation, mechanism to reduce the mutual risk. They also suggest using the representation theory and the cost transaction consist of four important risk situations: (imprisoning, contract amendment, unexpected transfer, disputes and complaints) (Bali and Rivard, 2003). Curren (2006) describes the risk as an incomprehensible unreliable result associated with the opportunity (Curren, 2006).

Project Risk Concept

Project risk is an unknown situation if it happens, it will have negative consequences on the project objects. In the projects, risk can be expressed as the chance of occurrence of any undesirable event and their unpleasant consequences. If risks, in the project real world happen they'll cause project delay, project discontinuity (stoppage) and project failure. They'll also effect on costs and quality of the projects. Bali says, because of importance of time, cost and the variety of client requests, IT projects face more risks (Barki *et al.,* 1993).Risk management is a 2 phases process: 1) Risk estimation phase including (recognition, analysis and prioritization) , 2) planning and corrective action (Boehm, 2007).

Outsourcing Concept

Outsourcing is named as external commission, or resources outsourcing. So far, There is no a unified and clear definition for outsourcing. Its nature is to entrust the matters which can't be done or can't be done well but others do better to them. To be exact, outsourcing is a management strategy and operation form. That is to say, a certain company, in line with the agreement reached with external other enterprise, outsources its business and function for which internal employees are responsible to the professional and efficient provider (Li- jun, 2012).

The term 'outsourcing' semantically is a compound expression derived from 'outside resource using'. Many researchers presented outsourcing as a sequential process consisting of a number of events, grouped into discrete phases or stages (Buse and Armonaitis, 2011). Outsourcing for the first time in decades in 1962 and 1970 by Rosseperotto confront with increasing demand of technical programs in comparison to inadequate supply of technical personnel, in 1980 decade. It was utilized to support IT then, in 1990 decade, it was exploited as a reliable solution to manage networks and telecommunication, develop integrated systems and software (Bullen, 2010).

Outsourcing is a contract or auxiliary contract which leads to release cash and give the ability to organization to benefit from its personnel, time and facilities in activities which has got competitive advantages. Accordingly, the organization will be able to focus on its strengths in other fields such as, information processing, production, marketing, remuneration accounting or its other commercial aspects and consequently benefit from cost reduction. Outsourcing is main inseparable part of reengineering and shrinking practices (Business Dictionary, 2011).

Outsourcing is a considerable external partnership to supply physical or human resources which are interrelated to IT in client organization or different kind of human, network and hardware asset transferring from client organization to an external agent which is responsible of the assigned activities (Yang and Borhuang, 2000).

Most of managers are optimistic about decision which has been making on IT outsourcing (Lacity, 2000). In the most of time, they consider their decision true and perfect .Their mind drowned in benefiting from outsourcing; hence they look at this issue optimistically (Saunders & Hu, 1999). Predominantly, the risk of outsourcing comes from incorrect management perceptive about outsourcing. In many organizations, outsourcing is part of its business model. Its objective is sharing space, time and organization facilities using technology (Sakthivel, 2005). Outsourcing is being increasingly considered as a global contention and lead organization to be more flexible. It gives this opportunity to organizations to access to global resources and they benefit from its considerable financial achievements (Gandhi, 2010).

Outsourcing Features

Based on Belcourt (2006) opinion, the activities should be outsourced which are not considered organization competitive advantages; however it's an applicable solution to help organization to get rid of business parts which have poor performance. However, outsourcing causes corporate culture collapse, but it makes transferring valuable experience to organization staff possible (Belcourt, 2006). Outsourcing is done in many industries and duties. Although, IT industries are leader in many outsourcing activities, other industries such as car and plane are concerned about outsourcing practices. Service industries such as call centers, medical diagnosis, financial services, tax preparation and software development services are prime candidates of outsourcing (Londe, 2004). Moreover, other duties which were not known noteworthy to be outsourced like complex product, they are recently getting to be outsourced (Gunter and Melchiori, 2001). Many organizations exploit outsourcing to be able to control their operational activities like IT (Bali and Rivard, 2003).

The organizations have remarked the best of self-assessment or economic analysis projects is social and strategic vision. The four outsourcing project leading factors include:

a) Management problems that have to be dealt with include inefficient performance of the departments, communication problems and selfishness between various departments.

b) Strategy- Firms need to focus on their core activities and outsource non-core activities. In addition, the firms can make strategic alliances with vendors to make up for shortages of resources or technology.

c) Technology- Possibly the fastest and most effective way to get the newest technology is to outsource. In-house workers can learn new technology of software management and development from the vendor.

d) Economic-The major consideration of a company is the reduction of costs in the development and maintenance of information systems (Gandhi, 2010). In order to evaluate the project risks is finding out the answer of these 3 fundamental questions, 1) what will come about? 2) What will be the possible result? 3) What will be the consequences, if it happens (Bali and Rivard, 2003)?

Outsourcing Risks

In a global challenging company, whereas 2 aspects including efficiencies and cost savings should be considered in outsourcing projects, this consideration will progressively make it more difficult. The project complexity as well as exponentially increasing stakeholders is making outsourcing process more difficult (Jackson, 2007). So the pros and cons of outsourcing projects must be carefully analyzed (Burmah, 2001). The only way to prevent loss is carefully outsourcing utilization (Aubert *et al.,* 2005). outsourcer is difficult to conduct a comprehensive understanding about the outsourcing provider's competence, integrity level, results of operations, social reputation and the cost structure, so that the former cannot choose suitable outsourcing contractors before outsourcing, resulting in adverse selection problems (Yajing and Deying, 2011). Whereas, commercial and business judgment influence on making decision on outsourcing, the outsourcing won't succeed unless a systematic assessment and analysis method is used (Welborn, 2007).in united states, because of higher salary in abroad and management problems, outsourcing activities have being increased (Gilbert, 2003). Based on Shi (2007) study, the main part of outsourcing activities (90%) still include decentralized activities regarding remuneration (Shi, 2007).

The business organizations should not be calculate their short term costs and make decision based on it. They must have enough acceptable reasons to attend in outsourcing project during their long-term business. They should focus on their capacity, their proficiency and their ability to make strategically decision on outsourcing. There are some common factors which effects on outsourcing risks, as follows, the delivery time, delay, technological problems, costs, vendor selection and auxiliary contactor levels, quality assurance, staff demoralization, communication, range of motion, the company brand, cultural gap among internal and external of the company. Intellectual property, (client and contractor) inflexibility, information security, business transfer, compliance with legal requirements, exchange rate fluctuation, inflation (such as oil price fluctuation).

Shi (2007) believes additional costs, lack of customer satisfaction, customer complaints are the common outsourcing failure symptoms. In his research, cost reduction which is one of main customer expectations can be considered a predominant reason which increases outsourcing costs.

In mentioned article, the outsourcing projects failure factors are classified as follows:

1) Client problems
2) Contractor (customer) problems
3) Client and contractor communication problem (Shi, 2007).

IT Outsourcing

Information technology outsourcing is companies focus on their core business and outsource all or part of their IT systems to a professional information technology services company. Outsourcing gives organizations the needed flexibility, responding to the rapidly changing global economy, at the same time, it also enables organizations to focus on their core competencies in the competitive market environment. However, as the constraints of the contract, information technology outsourcing projects compared to other software projects, whether in outsourcing, software or other aspects of the contract itself, there is more risk factors (Yajing and Deying, 2011). The IT outsourcing is recently a considerable issue. Many IT projects are done using outsourcing. However, the IT outsourcing failure rate is high, in many organization, the rate of projects which are awarding to other contractors in form of outsourcing have been progressively increased. This increasing doesn't mean there in no problem. It shows while organization benefit from outsourcing in form of cost reduction, they face some unsuccessful experiences like lack of access to desirable service. Inaccurate circumference analysis is one of the logical reasons which cause failure. Lack of risk management cause lots of trouble to organization. Most of the risk management analysis reduces some risks while they increase remaining ones. A solution can be risk assessment and prognostication. Organization trust on foreign suppliers prevents the local proficiencies to be developed sufficiently. If the outsourcing activities move through organization competitive advantages, the organization vital signs will vanish. One of aspects being recently considered is outsourcing risk management process (Aubert, et al., 2005).

There are lots of important and potential advantages in IT outsourcing activities which include cost savings, service quality, and access to technical expertise. In this regard many researchers confirm that if the outsourcing potential risks are neglected, the organization cannot benefit from its advantages. The transaction theory points out to the main risk factor sources such as Transaction, consumer and supplier. Researchers consider this theory as a suitable theory to recognize factors which influence major risks. Those factors involved with risks are as follow;

- Specific assets (customer & client investment and human resources)
- A few numbers of suppliers
- Uncertainty
- Communication (internal/external)
- Measurement problem (job standardization, duty complexity, task difficulties, competency level respect to outsourcing practice) (Bali and Rivard, 2004).

Research Methodology

The objective of this paper is factors identification and prioritization which cause outsourcing risks. This is an applied research, the combination of quantitative and qualitative methods were used. The meta-synthesis method was used to find the risk factors. The field data was gathered and priories using questionnaire. 79 references contains (papers and PhD thesis) were chosen to develop meta-synthesis method and 18 ones were selected to as a basis to define the criteria. 79 sub-factors were classified using this methodology. 39 sub-factors were selected to develop the questionnaire. The questionnaire was filled in by 2 groups; the first group includes managers and IT professors of management school of university of Tehran. Second group includes, IT experts and IT projects managers who attended in 2nd IT project management congress on summer 2011. The first group contains 5 individuals and the second one contains 58. The effectiveness of the recommended model was verified by using statistical tests. And the second questionnaire was corrected applying the IT project professors' comments. This was sent to be filled in by the 100individuals from the organization which is ranked first by the IT council and the company which has permission from industry and mine ministry

The Research Findings

First, the researcher studied the theoretical and conceptual principles and the accomplished studies regarding this issue. Using meta-synthesis method which was modified by applying IT experts' comments, the 79 sub-factors were extracted, finally 39 out of these 79 sub-factors were selected and the questionnaire was validated through a 2 step verification process (Table 1). The questionnaire contains 3 sections. First section comprises the demographical information of the respondents. In the second section, the respondents, through Likert spectrum, answered the 39 questions relevant to those 39 sub-factors classified in 7 categories. The third section includes some parameters to define the importance of any outsourcing risk factors and the severity of these risks. The questionnaire distributed among 100 people from the sample statistical population. The 67 out of them fill out the questionnaire and the results were analyzed to examine the assumptions.

Table 1. Effecting outsourcing risk Factor and sub-factors classification

Row	Factor class	Risk factors
1	Contract	Change in Contact conditions Depart from the contract content Using contracts which are not prepared based on specific procedure Insufficient time allocation to execute the contract
2	Costs	Switching cost Management and unexpected costs Hidden service costs Delay costs Undelivered items in the due time Lack of financial resources Exchange rate fluctuation Inflation Assessment and management costs
3	Legal consequences	Two parties lack of knowledge of contract substances The intellectual property of the contract outcomes is not specified Inadequate legal requirements
4	Security	Security worriment Lack of mutual trust Lack of trust in business among Contactor and client Lack of client control
5	New technologies and innovation	Inadequate knowledge about technologies inability to exploit the a new technology Contractor nonconformity with new technology There is not the desirable capacity for Innovation in Contractor
6	Client	Cultural issues and client inability to adjust with new situation Client inability to face the probable changes/variations Poor client performance in contractor selection Dependency on the limited number of contractors Lack of organizational training
7	Contractor	Lack of knowledge Poor performance Financial instability Contractor inflexibility

The Descriptive Statistics of Research Variables

Utilizing the average analysis of individual samples, the score which was given by respondent to each factor was compared with the average and the deviation has been analyzed individually for each factor. It shows that the number of the level of analyzing meaningful test result have an acceptable error less than 5%. So it can be concluded that the average of given scores to each factor have a remarkable difference with 3 which is the average number of Likert spectrum. This statistical population believes the 39 factor has considerable effects on IT outsourcing.

Table 2. Average review rating factors have been identified using single-sample test

Factors	Average	Significant	Degrees of freedom	Test statistic
Contract	4/2164	0/000	65	21/533
Costs	3/8016	0/000	65	11/585
Legal consequences	3/7323	0/000	65	7/264
Security	4/0062	0/000	65	12/511
New technologies and innovation	4/0423	0/000	65	11/954
Client	4/0478	0/000	65	18/028
Contractor	3/9957	0/000	65	13/032

Table 2 indicates the result of statistical test for analyzing respondents' viewpoint about risk factors proposed in this survey. As demonstrated all risk categories have been proved by project managers and experts. Risk factors related to contract, client and client are ranked as the most three important factors from experts' standpoint.

Using Friderman non-parametric test, the effective factors were classified descriptively. Based on this test, the first factor is contract, second, client, third, new technologies and innovations, forth, security, fifth, contractor and sixth costs and the last factor, legal requirements.

Conclusion and Suggestion

Being aware of the most influencing risk factors of outsourcing practices is a vital issue in decision-making procedures as well as reduction of potential losses in the future.

Regarding the research findings in the descriptive statistics and viewpoints of respondents contract factor is ranked as 1st, client is ranked as 2nd, new technology and innovation are ranked as 3rd, safety and security is ranked as 4th, contractor issues is ranked as 5th, costs is ranked as 6th and regulative factors is ranked as 7th priority. In addition, there are 5 sub-factors that have acquired maximum remarks in the descriptive statistics based on respondents' viewpoints are as follow respectively;

1- Violation from terms and conditions stipulated in outsourcing contracts

2- Inadequate allocation of time period for contract execution

3- Weak Performance of Contractor Organization

4- Costs of Undelivered items

5- Use of contracts which is not modified based on a specific procedure

There are some suggestions made below according to the issues mentioned above.

Providing the Client with Suggestions Based on the Research Findings

Violation from Terms and Conditions Stipulated in Outsourcing Contracts

The contract is one of the main components of any agreement. Services proved by the contractor clarify the financial and regulative issues as well as duration of the agreement as a reference. Parties are required to study the contract terms and conditions as well as possible due to contract's requirements. It is not usually expected that outsourcing could meet all of the client's requirements unless parties had stated articles involving arbitration and cases of default in the agreement. In his paper, Tafti suggests a mutual committee to overcome such issues (Tafti, 2005). This committee has the full authority to monitor and supervise the contract terms and conditions as well as parties' performance so that prevent any inconsistencies between existing situation and targeted objectives and provide them with appropriate comments. This issue may bring about hazards to client more than contractor. It should be noted to the following issues;

- Analysis of the contractor backgrounds and records,
- Use of standard contracts, and
- Utilization of experienced and competent knowledgeable consultants who are familiar with existing rules and regulations.

Author's Suggestion: This issue may bring about hazards to client more than contractor. It should be noted to the following issues;

- Analysis of the contractor backgrounds and records,
- Use of standard contracts, and
- Utilization of experienced and competent knowledgeable consultants who are familiar with existing rules and regulations.

Inadequate Allocation of Time Period for Contract Execution

Time period of most outsourcing contracts are set long-term agreements. According researches made in this regard, minimum time period of successful contracts revealed to be 4 years which contributes to cost saving practices. Signing a long-term contract may put a company at risk if it fails to predict its future business. On one hand, a contractor may be reluctant to provide services more than minimum satisfying level if the project period is longer than business as usual. On the other hand short-term contracts make the contractor to prove its qualification for further projects (Tafti, 2005). Client is required to pay specific attention to such time schedule because the contractor is the one which can handle executive aspects of the project and tries to maximize its profit when the contract is finished.

Author's suggestion: Client is required to pay specific attention to such time schedule because the contractor is the one which can handle executive aspects of the project and tries to maximize its profit when the contract is finished.

Weak Performance of Contractor Organization

In a research study published by Apex institute, there are three main contractor's performance related risks as follow;

1) Contractor's Performance and complying,
2) Identification of contractor's main role,
3) Creating of performance feedback monitoring and control

Successful execution of these three issues shall provide a proper control on the contractor's performance.

43% of participants in the present report stated that performance-related control issues on the contractor performance are evaluated as average management. Proper planning and other controlling processes shall prevent contractor's weak performance and consequences. Adverse consequences of contractor's weal performance are inevitable if such controlling actions are not existed or monitoring procedures are week (Apex, 2004). However, historical experience records should be noted carefully (such as superior execution statement report of the contractor).

Author's suggestion: Client is required to pay specific attention to historical experience records such as superior execution statement report of the contractor.

Costs of Undelivered Items

IT organization used to emphasize and concentrate on technical issues in the past. Nowadays, service quality is a highly demanded issue requested by organizations which is a time-dependent expectation, that is, those IT organization proceed based on such expectations are required to focus on service quality, time and related costs (Banshi, [Bita]). Organizing delivery operations in an appropriate time period and requested level is one of the main issues that managers are dealing with. Identification of requested time and level of basic materials is a time consuming and difficult task. In addition, changes introduced in further orders makes the delivery procedure more complicated and sometime creates delivery disorders. It should be noted that most of contractors have got a standard agreement which use in every contract. However, such agreements are written in favor of contractors and don't include damage compensation procedure. Clients are advised to pay attention to their benefits in advance if they are willing to utilize such contracts (Tafti, 2005). So it should be carried out in advance of contractor selection and binding any agreements. In addition, consequences should be referred in the contract articles.

Author's suggestion: this article should be noted in advance of selecting contractor and due date of signing any agreement and should be stipulated in the contract articles together with its consequences.

Use of Contracts which is Not Modified Based on a Specific Procedure

Potential risks could be managed through quality standards and appropriate agreements in outsourcing practices (Dhar and Balakrishnan, 2006). Having specified a general, well-defined, comprehensive and mutually agreed plan, parties can easily and effectively manage related issues. Complying with following issues is among the least requirements to be predicted in a standard agreement; stipulation of terms and condition of transfer, spiritual ownership, management, monitoring structure, guarantee requirements, Information Technology, product/service description, business type, market supply analysis, process records, detail specification of requirements and statement of general costs including price, time, quality and other contract-related issues (Apex, 2004). It should be noted that client can easily prevent such pitfalls using experienced consultants who are familiar with existing related rules and regulation.

Author's suggestion: client can easily prevent such pitfalls using experienced consultants who are familiar with existing related rules and regulation.

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