

A Review of Risk Management for Information Systems Outsourcing

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Abstract

Information systems (IS) outsourcing has become a very important part of strategic management in today's business environment. The strategy of IS outsourcing has proved to be effective but comes with major risks that must be properly managed. Risk management is an integrated part of IS outsourcing. Without proper risk management measures, an IS outsourcing project can easily fail. With the rapid changes in information systems configuration and delivery method, it is imperative that risk management practices be adapted to the new challenges. This paper discusses IS outsourcing risk management by reviewing the most important recent studies and breakthroughs in this area.

Keywords: Information systems, information technology, outsourcing, risk management, off shoring

1. Introduction

Outsourcing is viewed as one of the most important management strategies of our time. The practice of outsourcing originated in the 1950s, but became widely adopted in organizations in the 1980s (Hätönen & Eriksson, 2009). At first, outsourcing was mainly driven by the need for cost reduction, but later became a means for strategic management. The industry of IS outsourcing has been growing at very high rates for years now. Information systems (IS) outsourcing is a growing and increasingly global phenomenon that has radically changed the way we do business, and the way companies interact with each other. Information systems (IS) outsourcing has many benefits to organizations, the most common being cost reduction, access to the state-of-the-art technology, focusing on core competencies, strategic intent, etc. We often forget to mention many risks that are often entailed by IS outsourcing. This work identifies the main risks associated with the outsourcing of IS functions today and provides ways to deal with them.

An information system outsourcing has been one of the critical issues facing IS management recently (Yang & Huang, 2000). These authors proposed a decision model using AHP (analytic hierarchy process) method for the structuring of the outsourcing problem. They argued that five factors including management, strategy, technology, economics, and quality should be considered for outsourcing decision. Ketler and Walstrom (1993) presented the different IS problems and various forms of outsourcing from 1960s to the 1990s as can be summarized in the following table (Table 1) (Yang & Huang, 2000).

Table 1: IS problems and outsourcing forms

Time	Problem	Form of outsourcing
1960s	Cost of hardware	Facilities or operation management
1970s	Expenses of software development	Contract programming
1980s	Lack of IS personnel and high demand of IS applications	In house
Early 1990s	To support vertical integration	Onsite facilities management and complete outsourcing
1990s	Rapid changing and complex technology	Partial outsourcing

Source: Ketler & Walstrom, 1993

IS outsourcing comes with a significant number of risks. Companies involved in IS outsourcing are encouraged to adopt a thorough risk analysis and management process to effectively mitigate outsourcing risks. The IS managers are encouraged to prepare IS outsourcing contracts that clearly indicate and quantify risks and benefits related to the process of outsourcing. In this study, information systems (IS) outsourcing and information technology (IT) outsourcing are used interchangeably.

2. Literature Review

2.1 Theoretical Background

Outsourcing is deeply based on the theory of transaction cost economics, also known as transaction cost theory, introduced by Coase (1937) and later developed by Williamson (1975, 1979, 1985). Coase (1937) made a suggestion that transactions should be organized within a firm when the cost of doing this is lower than the cost of using the market. Coase and Williamson's ideas on transaction cost theory are considered as the prominent ideas behind outsourcing. Bahli and Rivard (2005) conducted a study aimed at validating measures of the risk factors associated with the practice of outsourcing IT operations. They concluded that from the transaction cost theory perspective, there are three major sources of risk factors for IT outsourcing: the transaction, the client and the supplier. Fan, Suo & Feng (2012) developed a method for the identification of risk factors for IT outsourcing, taking into consideration the interrelationships among these risk factors. Gonzalez, Gasco & Llopis (2006) analyzed the IS outsourcing literature with the aim of identifying the main topics, the methodologies often applied, and the authors and countries that have contributed most to the area of IS outsourcing.

2.2 IS/IT Outsourcing Risks

The decision to outsource IS functions involve multiple risks. Scientists and researchers increased their focus on the field of risk management in IS outsourcing from 1998 (Dibbern et al. 2004). Dibbern et al. reviewed articles published from the year of 1994 to the year of 1999 with a particular focus on the topic of risk management in IT Outsourcing. Martens & Teuteberg (2009) continued the work started by Dibbern et al. and analyzed articles related to this topic that were published from the year 2001 to the year 2008. They presented an analysis of past, present and future research on IT Outsourcing and risk management in IT Outsourcing. Chou & Amy (2009) identified an information systems outsourcing life cycle through three project-related periods: pre-contract phase, contract phase, and post-contract phase, and risks associated with each phase. They further discussed ISO quality standards and risk management standards. A study by (Gonzalez, Gasco & Llopis, 2004) showed the main risks computer outsourcing entailed for the largest Spanish firms, from the customer's point of view. Their findings showed that selective outsourcing or choosing outsourcing with multiple providers was better than total outsourcing.

Gonzalez, Gasco & Llopis (2010) stated that outsourcing was going through a stage of unstoppable growth, and assessed the main reasons for information systems (IS) outsourcing and risks faced by IS clients. They carried out their study from the client perspective using the "questionnaire" methodology. Their findings showed that outsourcing provides IS services and technological improvements to organizations. In their study, cost saving was not seen as a priority reason for IS outsourcing. They also noticed that large firms were the most prone to outsource. They carried out a component factor analysis using Kraiser Criterion and found that there were three reason factors for IS outsourcing: strategic reasons, technological reasons, and economic reasons; and three risk factors for IS outsourcing: outsourcing generic risks, risks derived from the lack of trust on the provider, and risks derived from the client. In this study carried out in Spain, it was noticed that larger Spanish firms considered outsourcing for better IS service, technological improvement, and cost saving was not a priority reason.

The following are the most reported risks involved in IT/IS outsourcing: information security, hidden costs, loss of control, auditing cloud based IT services, managing heterogeneous services, coordinating involved parties, managing clients-vendors relationships, localizing and migrating data, coping with lack of security awareness, provider staff qualification, lack of compliance with the contract by the provider, loss of technical knowledge for the client company, the provider's inability to adapt to new technology, unclear cost-benefit relationship, irreversibility of the outsourcing decision, possible opposition of the staff to the outsourcing decision, total dependency, exit barriers, physical information systems security, legal consequences, logical information systems security, confidentiality and privacy of data, human resources issues, possibility of weak management, inexperienced staff, business uncertainty, outdated technology skills, endemic uncertainty, lack of organizational learning, loss of innovative capacity, technological indivisibility, fuzzy focus,...

According to Gonzalez, Gasco & Llopis (2010), the most common IS outsourcing risks are: provider staff qualification, lack of compliance with the contract by the provider, excessive dependence on the provider, loss of critical skills and competences, provider's inability to adapt to new technologies, hidden costs, unclear cost-benefit relationship, security issues, irreversibility of the outsourcing decision, staff issues, and possible opposition of the staff to the outsourcing decision.

These risks need to be taken into account while considering the decision to outsource IS functions. In most cases, the client will feel an excessive dependence on the provider, and a loss of valuable knowledge. Given the fact that a majority of companies are outsourcing their IS functions today, they need to implement a risk management system for IS outsourcing in order to achieve their business goals and objectives. Risk management is very important for any IT/IS outsourcing project. If not properly managed, risks related to IT/IS outsourcing can lead to the failure of the whole outsourcing endeavor.

There are a total number of 7 steps involved in risk management (Martens & Teuteberg, 2009):

- Context analysis
- Risk identification
- Risk analysis
- Risk evaluation
- Risk treatment
- Risk monitoring and review
- Communication and continuous improvement of risk strategy

In a systematic review of the IT outsourcing literature with a clear focus on risk management, Martens and Teuteberg (2009) analyzed a total of 97 papers and found a total of 23 risk factors related to IT Outsourcing which they grouped into 5 categories (economical, organizational, legal, technical, and psychological). These authors noted that risk management took a relatively weak position in IT Outsourcing articles. They added that due to an increase in national and international regulations and standards, the risks that today's companies have to face are growing and risk management for IT outsourcing is explicitly demanded by suppliers, clients and states.

The following table (Table 2) illustrates those risk factors.

Table 2: Risks related to IS/IT Outsourcing

Category	Risk factor
Economical	<ul style="list-style-type: none"> • Quality doesn't meet agreed service level agreement (SLA): Sometimes the customer is not capable of evaluating the quality of IT Outsourcing services correctly (theory of adverse selection). • Hidden costs: Cost outside those mentioned in the contract (communication costs, transition/switching costs, post-outsourcing costs). • Lack/Poor performance measurement: lack of mutual monitoring or controlling of the client and the provider. • Poor cost management: miscalculations, budget overrun, and unclear cost/benefit relationship. • Loss of skilled IT employees: loss of skilled IT staff and negative impact of employee morale. • High moral hazard: a company acts in an irrational way since it does not bear the consequences of actions. • High assets specificity: overspending due to high transaction costs and a small number of providers on the market. • Low financial stability: financial stability of the provider is very important
Organizational	<ul style="list-style-type: none"> • Lack of provider expertise: provider's experience and know-how/knowledge of IT operations and IT outsourcing projects. • Loss of competence: in case outsourced IT services are close to core competences, future actions can be threatened (undermined). • Low customer capability: Low customer experience with IT operations / IT outsourcing • Poor project management: Insufficient planning and management of IT outsourcing projects. • High performance oscillation: provided performance after contract conclusion has high oscillations. • Excessive dependence on provider: customer has a limited scope of action. • High task complexity: the service or task complexity influences the achievement of objectives.
Legal	<ul style="list-style-type: none"> • Lack of provider expertise with law: expertise with IT Outsourcing contracts (pricing clauses, liability clauses, renegotiation clauses). • Legality of contract: scope/size/compliance/penalties of IT Outsourcing contract, poor contract management. • Lack of customer expertise with law: customer experience regarding IT Outsourcing contracts. • Irreversibility of outsourcing decision: back-sourcing is usually not economical
Technical	<ul style="list-style-type: none"> • Lack of privacy/Data security: confidential data/intellectual property • Lack of flexibility: inability to adapt new technologies
Psychological	<ul style="list-style-type: none"> • Cultural disparity: cultural barriers between the customer and the provider. • Poor user integration: IT users have insufficient influence on the IT Outsourcing project/services.

Source: Martens & Teuteberg, 2009

3. IS/IT Outsourcing Risk Models and Frameworks

Abdullah and Verner (2008) investigated risks that are most likely to cause failure in a strategic IT system development outsourcing project from the client perspective. They further developed a risk framework using IT outsourcing stages as a basis. Abdullah and Verner (2012) developed a literature-based conceptual risk framework for IT system development outsourcing from the client perspective. They also investigated critical client risks for strategic IT system development outsourcing projects and the most common critical client risk factors for such projects. They found that risks critical to a client are associated with complexity, contract, execution, financial, legal, the organizational environment, planning and control, scope and requirements, the team, and the user.

Martens and Teuteberg (2009) reviewed a total of 97 papers related to IT outsourcing published between the years 2001 and 2008, with a focus on risk management. They also provided an overview of applied research methods and theories in the field of IT outsourcing. They then discussed elements of a research agenda to determine further steps needed to the construction of a reference model for risk management in IT outsourcing.

The increase in national and international regulations and standards makes risk management for IS outsourcing highly demanded by all stakeholders involved in the process of IS outsourcing. A study by Gonzalez et al. (2006) showed that the topic of risk management was not very present in the research done at the time. Osei-Bryson and Ngwenyama (2006) offered a method and some mathematical models for analyzing risks and constructing incentive contracts for IS outsourcing. Roghanian and Mojibian (2015) proposed a fuzzy-based risk management model that covers three parts of risk management process: risk identification, quantitative risk analysis, and risk response planning. The model also identified different kinds of risks through the project life cycle. The model is based on FMEA (Failure Mode Effect Analysis) and AHP (Analytic Hierarchy Process).

4. Risk Factors of IS/IT Outsourcing

Fan, Suo and Feng (2012) identified the following risk factors for information technology outsourcing (Table 3)

Table3. Risk factors for IT outsourcing

Risk factors	Descriptions
Technological indivisibility	Since much of information technology is not divisible, trying to divide it into parts for different vendors can be problematical.
Possibility of weak management	New type of IT outsourcing management may be more difficult. Weak management could increase cost and lead to conflict and dissatisfaction.
Cultural fit	Poor cultural fit may damage the outsourcing relationship between client and vendor and lead to conflict between them.
Requirements instability	Future direction and requirements of the client may change in the process of IT outsourcing operation.
Coordination between client and vendor	Effective coordination between client and vendor could facilitate the favorable cooperation in the process of IT outsourcing operation.
Reliability of selected vendor(s)	Unreliable vendor(s) may influence the schedule and quality of IT outsourcing operation.
Uncertainty about the legal environment	Legal environment is the external condition for IT outsourcing. Uncertain legal environment could influence IT outsourcing operation.
Technology complexity	Technological complexity may influence the schedule of IT outsourcing operation and the quality of task accomplishment.

Source: Fan, Suo & Feng, 2012

Despite the fact that information systems outsourcing has been growing at a considerable speed, there are still many risks involved with the outsourcing process, and these risks have been changing with the changes in the technology landscape.

Gonzalez et.al (2004) suggested that firm characteristics such as the firm size determines what risks can be seen as the most relevant. It concludes that total outsourcing can turn out to be an extremely dangerous strategy because it creates full dependence on the provider. One of the main concerns outsourcing companies face is the excessive dependence on the provider that comes with this type of arrangement. IS managers should rely on other alternatives such as proceeding with the multiple-provider approach or selective outsourcing.

The following are the risk factors in each stage of the outsourcing process (Fig. 1)

Risk Factor in the Outsourcing Process

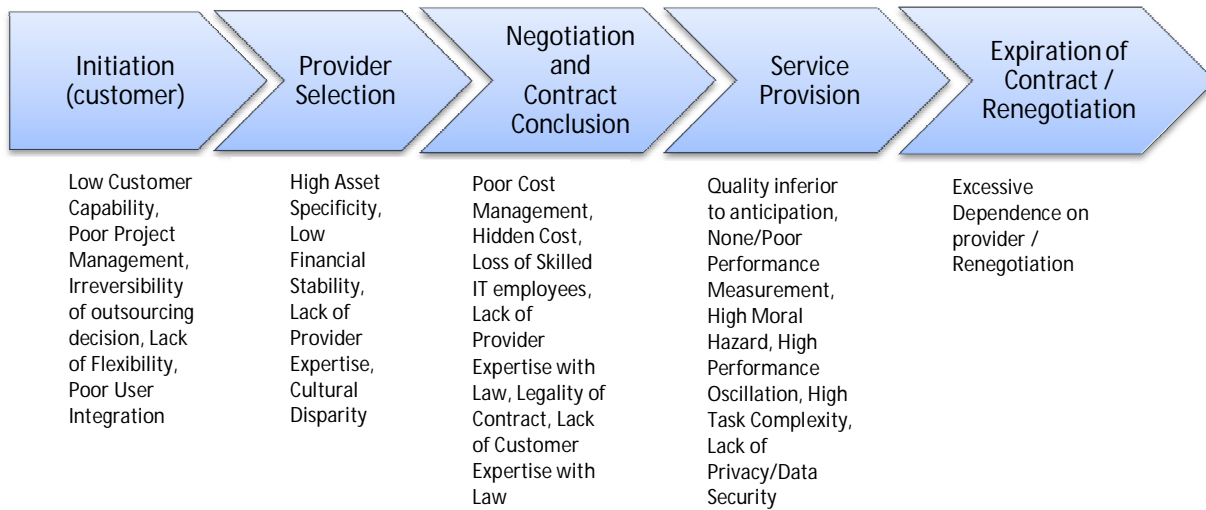


Figure 1: Typical IT Outsourcing process (Martens & Teuteberg, 2009)

5. Current Trends and Future Research in IS/IT Outsourcing Risk Management

Risk management in IS outsourcing is an ongoing process and consists of three main elements: the supplier and contract management, billing, and service level agreement (SLA). The SLA needs to be reviewed and updated regularly and this should be clearly stated in the contract. The growing phenomenon of offshore outsourcing is forcing organization to rethink the way they understand risk management in information systems outsourcing. Offshore outsourcing refers to outsourcing done in different countries. Outsourcing risks are no longer confined to a particular organization or geographical location, but are rather distributed among different organizations and geographical boundaries. The fact that IS outsourcing is no longer location dependent creates new challenges for all the parties involved in an outsourcing project. This trend has been enabled by the rapid globalization of IT and the continuous improvement of ICT infrastructure in different regions of the world. The phenomenon of globalization has reached all sectors of life, and certainly ICT couldn't be left out of it. The globalization of IT outsourcing is gaining momentum with the current maturing of cloud computing and the provision of software as a service. Cloud computing is changing the way IT business is done through major providers like Amazon, Google, Sales force, etc. With this trend emerge new risk factors, therefore risk management in IT Outsourcing needs to be redesigned.

The focus on offshore outsourcing increased considerably from the year 2008 (Martens & Teuteberg, 2009). Until now, risk management in IT outsourcing is not well researched, there is a growing need for more researches in this field. Our study is an attempt to reduce the gap in that regard basing our research on best practices and insight from existing literature. A good risk management model should be continuously improved to include new emerging risks factors in the analysis and construction of the model.

6. Conclusion and Recommendation

Outsourcing has become an integrated part of strategic management. We are witnessing an increase in the adoption of IS outsourcing by firms around the world, and there are many risks involved in IS outsourcing. In today's competitive global business environment, in order to be successful, companies and organizations engaging in IS outsourcing need to develop comprehensive approaches to effectively manage risks involved in IS outsourcing. This paper reviewed some of the most important studies related to IS outsourcing risk management, and provided insights into the notion of outsourcing risk management.

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References

- Abdullah, L. M., & Verner, J. M. (2008, May). Risk framework for outsourced strategic IT system development from the client perspective. In *Software Metrics European Forum*, Milan, Italy (pp. 1-12).
- Abdullah, L. M., & Verner, J. M. (2012). Analysis and application of an outsourcing risk framework. *Journal of Systems and Software*, 85(8), 1930-1952.
- Chou, D. C., & Chou, A. Y. (2009). Information systems outsourcing life cycle and risks analysis. *Computer Standards & Interfaces*, 31(5), 1036-1043.
- Coase, R. H. (1937). The nature of the firm. *Economica*, 4(16), 386-405.
- Fan, Z. P., Suo, W. L., & Feng, B. (2012). Identifying risk factors of IT outsourcing using interdependent information: An extended DEMATEL method. *Expert Systems with Applications*, 39(3), 3832-3840.
- Gonzalez, R., Gasco, J., & Llopis, J. (2004). A study of information systems outsourcing risks. *ECIS 2004 Proceedings*, 71.
- Gonzalez, R., Gasco, J., & Llopis, J. (2006). Information systems outsourcing: A literature analysis. *Information & Management*, 43(7), 821-834.
- Gonzalez, R., Gasco, J., & Llopis, J. (2010). Information systems outsourcing reasons and risks: a new assessment. *Industrial Management & Data Systems*, 110(2), 284-303.
- Hätönen, J., & Eriksson, T. (2009). 30+ years of research and practice of outsourcing—Exploring the past and anticipating the future. *Journal of International Management*, 15(2), 142-155.
- Martens, B., & Teuteberg, F. (2009). Why risk management matters in IT outsourcing—A systematic literature review and elements of a research agenda.
- Osei-Bryson, K. M., & Ngwenyama, O. K. (2006). Managing risks in information systems outsourcing: An approach to analyzing outsourcing risks and structuring incentive contracts. *European Journal of Operational Research*, 174(1), 245-264.
- Roghanian, E., & Mojibian, F. (2015). Using fuzzy FMEA and fuzzy logic in project risk management. *Iranian Journal of Management Studies*.
- Williamson, O. E. (1975). Markets and Hierarchies. Analysis and Antitrust Implications. *The Free Press*, New York, 26-30.
- Williamson, O. E. (1979). Transaction-cost economics: the governance of contractual relations. *Journal of Law and Economics* 22, 233-261.
- Williamson, O. E. (1985). The economics of organizations: the transaction cost approach. *American Journal of Sociology* 87(3), 548-577.