



# INFORMATION SYSTEMS SECURITY OUTSOURCING KEY ISSUES: A SERVICE PROVIDERS' PERSPECTIVE

Pereira, Luís, ISEG – Technical University of Lisbon, Lisbon, Portugal,  
luisfxpereira@hotmail.com

de Sá-Soares, Filipe, University of Minho, Guimarães, Portugal, fss@dsi.uminho.pt

Caldeira, Mário, ISEG – Technical University of Lisbon, Lisbon, Portugal,  
caldeira@iseg.utl.pt

## Abstract

*There is a perception that information systems security outsourcing, in spite of entailing a relationship between a client and one or more providers, tends to be studied and analysed from the perspective of the client. A gap is then believed to exist in the study of the information systems security outsourcing relationship from the point of view of the service provider. This research aims to identify the key issues of such a relationship from the perspective of the service provider and rank them according to their importance. The Delphi method was used to support the communication with the group of experts contributing to this research as well as to boost consensus within the group. Final interviews with participants were also conducted with the aim of reaching deeper into their opinions and to shed a brighter light over the results of the Delphi. A ranked list of the 13 most important key issues found is presented and discussed and propositions for further work are put forward in the wake of the study.*

*Keywords: information systems security outsourcing, information systems security, key issues study, Delphi method.*

# 1 Introduction

The information systems security (ISS) outsourcing relationship, as any relationship, presupposes the existence of two or more parties. This type of relationship is formally instantiated in the form of contracts between the party that resorts to outsourcing (the client) and the ones performing the activities outsourced (the service providers).

If the benefits of outsourcing are to be attained, the success of such relationships is paramount. That is why this study aims at unveiling which are the key issues in creating and maintaining a successful ISS relationship between client and service provider. Former studies usually take on the client's point of view, but, although that is an important point of view, the service providers' point of view seems to be lacking the insight which this study intends to fulfil.

The study aims to find key issues towards a successful ISS outsourcing relationship from the perspective of the service providers and rank those issues according to their importance.

It is believed that this research is of particular importance due to the delicate nature of its subject (outsourcing of ISS activities by organizations) but also in deepening the understanding of the ISS outsourcing relationship in order for organizations to steer their path in the right direction.

The paper is structured as follows. After this introduction, we review the literature on information systems (IS) outsourcing and on ISS outsourcing. Then, the research design is depicted, which is followed by a description of the study. Finally, we present the main results of the study and discuss them. The paper ends by drawing conclusions and suggesting future work.

## 2 Literature Review

### 2.1 Information Systems Outsourcing

In the IS context, Kern and Willcocks (2001, p. 1) define the outsourcing of IS as “the handing over to a third party of the management and operation of an organization's IT assets and activities”, as a whole or partially.

The cumulative knowledge on IS outsourcing is significant. In a review of IS outsourcing research, published between 1990 and 2008, Lacity et al. (2009) classified 191 papers into six topics: determinants of IS outsourcing, IS outsourcing strategy, IS outsourcing risks, determinants of IS outsourcing success, client and supplier capabilities, and sourcing varieties.

The most researched topic has been the determinants of IS outsourcing success. The work on this topic can be classified into three categories: the IS outsourcing decision making, contractual governance, and relational governance. Research on IS outsourcing decision making has focused on the degree of outsourcing, top management commitment/support, and the evaluation process for selecting providers. Research on contractual governance has considered four determinants of success related to the outsourcing contract: its detail, type, duration, and size. The studies on relational governance cover soft issues in the client-provider relationship management, including trust, norms, communication, sharing of information, mutual dependency, and cooperation.

Closely linked to these determinants are the client and provider capabilities. These include overall capabilities such as IS technical/methodological capability, IS human resource management capability, provider management capability, contract management capability, domain capability, IS change management capability, transition management capability, and client management capability.

A retrospective of the nearly 20 years of literature analysed by Lacity et al. (2009) shows that the management of the outsourcing relationship is “a perennial and challenging issue” (p. 130). Not only





The selection process began by listing a group of 20 companies operating in Portugal that provide ISS services. The targets in these companies were managers and senior consultants working in ISS. Several approaches were applied to compose the expert panel, namely using the researchers' networks of contacts, searching corporate websites, and resorting to LinkedIn to browse for people with the characteristics that were pursuit vis-à-vis their background, experience, and current position.

Invitations to participate were sent and we got an agreement of participation from 14 professionals representing 13 companies. The average work experience of these professionals was 14.4 years (min = 8 years, max = 23 years).

During the study, the communication process with participants would observe the following protocol:

- An email initiated each round conveying information about the objective of the round; the time period it would be open to answers; the Web link and credentials that would enable the expert to participate; a guarantee of confidentiality and anonymity; a highlight of the importance of their contribution to the outcome of the study; disclosure of the researchers' contacts for any unforeseen circumstance; and in rounds after the second one, a brief description of the consensus obtained in the previous round;
- To those participants that had not yet responded, a reminder would be sent by email two days before the answering period ended and on the day the answering period ended;
- One extension to the answering period would be allowed, never exceeding one week; and
- In case of contacts made by participants a timely answer by the research team was mandatory.

In what concerns the type of rounds, we decided to perform a blank sheet first round. The first round of the Delphi process would be used to collect from participants their opinions on what are the key issues surrounding a successful ISS outsourcing relationship. This was seen necessary since no relevant issues were identified in the literature specifically for the case of ISS outsourcing and focusing on the point of view of the service provider. It was also decided to conduct open rounds (in which participants can add new issues they think are relevant) after the blank sheet first round until a round comes in which no issues are added.

A Web tool was used to administer the questionnaires to participants. The use of this tool would give experts flexibility and convenience of answering, speeding up the turnaround time between questionnaires and helping participants abide the rules of the Delphi with Q-sort. It also served as a repository of answers from which data could be retrieved to be analysed by researchers.

A decision was also taken to trim the issues that were considered less important in case the study should extend beyond the second round. This decision was made in order to reduce participants' cognitive effort during ranking rounds, to motivate them to continue answering the questionnaire, and to assist in the promotion of consensus. The number of issues to trim would be determined taking into account the mean and standard deviation of the issue in the panel global ranking, its mode(s), the number of respondents that scored the issue in the first positions, and the existence of outliers.

The interaction between the experts' opinions may lead to a varying level of consensus. This level can be calculated but there is a need to determine at which level one considers experts to have reached consensus. Prolonging rounds indefinitely would certainly trigger the law of diminishing returns if experts were to be taxed with too many questionnaires. On the other hand, stopping the study too early could hinder its outcome as well, possibly because no valuable results were attained.

For this study, the set of stopping criteria for judging panels' consensus had three rules:

1. Kendall's W of the round should be equal or greater than 0.7 (this rule establishes a threshold for the consensus between participants in a given round);
2. Spearman's rho between rounds should be equal or greater than 0.9 (this rule establishes a threshold for the stability of answers between consecutive rounds); and
3. If the criteria above were not met when the fourth round is reached then the study will stop at the end of the fourth round (this rule establishes a maximum number of rounds to achieve consensus).

If after the four rounds consensus was not reached, the researchers would try to qualitatively elicit the rationale behind each individual ranking by conducting interviews with participants.

## 4 Description of Study

The study involved the administration of four rounds of questionnaires and a final interview to the participants of the fourth Delphi round.

### 4.1 Delphi Rounds

Table 1 summarizes the four Delphi rounds. For each round, it is indicated its type, the number of experts that participated (responses), the number of issues involved, and the values for Kendall's W and Spearman's rho where applicable. All the 14 experts that agreed to participate in the study were contacted to take part in each of the four rounds.

#Round	Type	#Responses	#Issues	Kendall's W	Spearman's rho
1	Blank sheet	10	57	n/a	n/a
2	Ranking, open	10	25	0.231 (p < .001)	n/a
3	Ranking, closed	9	20	0.120 (p = .361)	0.614 (p = .004)
4	Ranking, closed	9	13	0.120 (p = .374)	0.324 (p = .280)

Table 1. Summary of Delphi Rounds

The first round was a blank sheet round, i.e., a round where participants were asked to provide, following the suggestion of Schmidt (1997), at least six issues that, from their point of view, are key to the success of an ISS outsourcing relationship from the service provider's standpoint. For each issue, participants were also asked to provide a brief description.

The ten experts that contributed to the round suggested 57 issues. These raw issues underwent a process of consolidation by the research team. This process consisted of grouping similar issues beneath an umbrella issue, and formulating a statement to designate the group of issues and a statement to provide a brief description aimed at clarifying the meaning of the overall issue. After a few iterations, this process was considered complete, resulting in a list of 25 consolidated issues.

In the second round participants were asked to rank the list of 25 consolidated issues according to their own point of view. The ranking of issues resorted to the Q-Sort technique which is embedded in the Web tool that mediated the administration of questionnaires. The issues were presented to participants without any meaningful order.

This second round allowed participants to add new issues they thought were missing from the list provided. These new issues would be included in future rounds. None did so which can be an indicator that the consolidation process was good and that the list was considered complete by participants.

The answers to the second round were analysed in relation to their degree of consensus. Kendall's W was calculated to be 0.231 (p < .001). According to Schmidt (1997), this reveals a weak agreement among experts. Since none of the stopping criteria were met, a third round was promoted.

Before starting the third round two decisions were taken. Since no participant added new issues to the list in the second round, it was decided to no longer allow that possibility to participants and thus the list was considered closed to new issues. The second decision was about reducing the set of issues to be ranked by participants in the third round. The decision was to trim the five issues that were considered less important by the panel in the second round.

The issues were presented to participants in the order of importance given by the panel as a whole in the previous round, from most important to least important.







The third result of the study derived from the analysis of the interviews. From a general point of view, when addressing their top three issues and the reasons for their choice, participants assumed two perspectives. The more common was seeing the client and the relationship as a future client and a future relationship, which still have to be won. The success factors of the relationship are taken for the issues that enable the selling of the service (cost-benefit ratio, credibility, and experience). This perspective contrasted with the one that focused on the factors that enabled a good ongoing relationship (response time, definition of responsibilities, and the existence of a business continuity plan) and the possibility of assessing the service being provided.

Most participants focused on the price of the service as a key point to win the client and also to maintain the service and the relationship. Issues such as quality of service, experience of the provider, and existence of previous successful relationships take second place behind that factor. The price factor takes precedence when the service being delivered is not differentiated and is seen as a commodity to a large extent. Here the client does not understand the real value of the service and sometimes decision-makers are truly not aware of the value of certain services. For the clients that understand the value of ISS, their demand tends to be based on the quality of the service and not as much on the price.

According to some participants, the motivation for some clients to outsource is the reduction of their costs. This, however, cannot be done successfully if the client does not know itself and does not know its processes. The maturity level of organizations also has to be high enough for them to resort to outsourcing successfully. According to one participant the existence of a business continuity plan is a sign of that maturity.

It was also evident that existed two conflicting views on how ISS outsourcing contracts are celebrated in Portugal. On the one hand, contracts are specific enough to effectively regulate the ISS service and the relationship between client and provider. This point of view tends to see confidentiality, integrity, and availability as premises of the service, enacted in the contract and without room for discussion on their contribution to a successful outsourcing relationship. The opposing view reports contracts as generic, with no specificity regarding ISS and leaves to the provider the responsibility of finding the scope of its service and almost self-regulating. As stated by participants, this may be the evidence of different maturity levels between organizations.

When participants confronted their answers to the fourth round with the group's answer, almost without exception, they tended to relate their own choices with the ones of the group. In fact, issues are not mutually exclusive and have some overlapping that cannot be excised. For example, trust can be related to credibility and the existence of previous relationships, and quality may be related to the competencies of human resources. Issues also have different granularity, with some issues being more general than other (e.g., trust was perceived wider than the existence of a business continuity plan).

## **6 Discussion**

The goals of this study were to identify key issues leading to a successful ISS outsourcing relationship from the point of view of the provider and rank these issues according to their perceived importance.

The first goal – obtaining a list of the most relevant issues – was pursued mainly in the first round of the Delphi study and then refined over subsequent rounds. The blank sheet first round supplied the study with 25 issues (cf. Table 2) that were then trimmed to 13 leading up to the fourth round, and following the stated preferences of the participants (cf. Table 3).

The study accomplished the first goal satisfactorily. This is due to issues spanning a variety of subjects and also because they can be related to issues mentioned in the literature review on ISS outsourcing.

In Table 2 we classified the 25 consolidated issues into five groups. The classification resorted to a subset of categories advanced by Dibbern et al. (2004), only this time used from the providers' angle.

Nine of the issues (36% of the 25 issues) were aggregated in the group “Provider Selection”. This group includes issues that serve as selection criteria of the provider by the client, such as providers’ reputation, cost proposition, capabilities, and successful past collaborations. The next three groups focus on the relationship between the two parties of the outsourcing arrangement. The group “Relationship Structuring” contains three issues (12%) that are deemed important when the outsourcing contract is being prepared. The group “Relationship Building” combines five issues (20%) that contribute to strengthening the relationship between provider and client. It is possible to link these issues with the category “relational governance” used by Lacity et al. [2009]. The group “Relationship Management” brings together four issues (16%) that are relevant to drive the relationship in the right direction, such as being able to show the delivery of the cost-benefit ratio, pairing ISS technical capabilities with soft skills competencies during the actual service delivery, and clear discrimination of outsourcing tasks performers in the course of providing service. The last group comprises four issues (16%) connected to the results of outsourcing (“Outcomes”). These issues highlight the real added value of the outsourcing arrangement, namely by demonstrating the realization of client’s expectations, the level of service quality, and the operational efficiency of the provider.

A similar analysis for the 13 most important issues (cf. Table 3) shows that five issues (~40% of the 13), namely issues #2, #6, #7, #10, and #13 pertain to the “Providers Selection” group, reinforcing the central nature of provider’s proven capability to perform the services to contract. The other four groups include two issues each (15%). The contractual governance issues focus the clear definition of responsibilities attributable to each party and the associated scope of action/role (#1) and the assurance that the provider will not unlawfully disclose or share client’s information (#3). In the “Relationship Building” group one finds the recurring theme of trust (#5) with an emphasis on the technical capability of the provider and its financial stability, so that the client does not fear the provider exiting the market and leaving the client in a difficult situation, particularly given the sensitive services outsourced. An additional issue (#12) relates to the existence of a business continuity plan the responsibility of the provider, so the provider is able to combine its ISS services to procedures dealing with incidents and disaster recovery. Regarding the management of the outsourcing relationship, the panel highlighted the importance of having clear methods and metrics (e.g., SLA) to measure, control, and audit the level of the ISS service provided (#8). In addition, participants stressed the need to form teams that congregate technical competencies (technical knowledge, certifications, etc.) together with non-technical skills, such as interpersonal, personal management, and communications skills (#11). The last two issues (#4 and #9) pertain to the “Outcomes” group and underscore what may be understood as ultimate proofs of a successful outsourcing arrangement: the compliance with the requirements initially contracted with the client and the availability of the provider to answer with a promptness matching the severity of the ISS event.

Part of these issues has been mentioned in the literature review and were known as relevant to the ISS outsourcing relationship. It should however be noted that the existing literature focuses on the client side while this study focuses on the service provider side, thence it is possible to reason that several issues appear to be common to both sides of the outsourcing relationship. Nevertheless, there are issues that seem specific to how service providers perceive the pursuit of a successful ISS outsourcing relationship with the client (security services diversity offered, support in regulatory and legal compliance, existence of a business continuity plan, and decreased operational costs for the provider).

Two criticisms arise though: the first deals with the fact that, even after being stressed constantly throughout the study that the intended point of view was the service providers’, it became obvious in the interviews that some participants always default (maybe unknowingly) to the client’s point of view. To them it is mainly a question of what the client is looking for in a service provider and what can they do to turn the decision in their favour. To a certain extent this makes sense, since the providers’ first goal is to stay in business and therefore have to think like the client in order to position themselves in the market. On the other hand, it makes it more difficult to understand which issues are specific to the provider. The second criticism deals with the fact that the issues have different

granularity and they are not completely independent from each other, triggering the participants to easily relate their most important issues to the panel's most important issues.

The second goal of this study was to rank the issues according to the relevance perceived by the group of participants. The results were not satisfactory. Kendall's W receded round after round, even when fewer issues were being considered, showing a weak agreement between participants.

The analysis of the convergence effort done by participants over the rounds showed that only 39% of the 104 issues that were ranked over the three rounds (considering the eight participants that answered all ranking rounds and the final thirteen issues) convey a consistent effort by participants to align with the panel's answer. This means that the convergence effort as a whole was not significant throughout the study. Also, volatility is an issue for several participants. This could be explained by the convergence effort of each participant, trying to move towards the group's answer. Since the convergence effort was deemed not significant, other reasons have to come into play, such as the degree of robustness of participants' opinions or shifts on successive answers by participants if they are not aware of their previous answers when they rank issues.

Regarding an overall similar answering behaviour by experts, there is a mild trend, which could be explained by the fact that, round after round, the number of issues is being reduced which inevitably leads to putting the surviving issues in the first positions. Another mild trend noticed is the match of participants' answers to the group's, but when the latter changes an overshoot effect seems to arise on the part of the participants.

We think that there is no clear and final reason to why agreement between experts was weak. Volatility of the participants answers, usability of the Web tool used to administer the questionnaires, similarity or dependence between issues, time taken to complete the four rounds of the questionnaires can all be waved but all without proof.

## **7 Conclusion**

This is an exploratory study since no information relating to the service providers' point of view in ISS outsourcing was found in the literature review and so this study treads new ground. This is increasingly important as outsourcing relationships become more common and tend to become more balanced and regarded as partnerships by the entities involved.

In spite dwelling on a difficult subject, the study was successful. The argument for it being difficult comes from the fact that it is a largely unexplored domain in which there is no background to provide structure to ensuing works, and also because in the field of ISS it is typically hard to harvest information and practitioners tend to not be as forthcoming as they could be.

However, the list of issues here compiled can certainly be a starting point to further studies dwelling on this topic. It can be presented to experts in a Delphi first round, so they can agree or disagree with them, refine and resolve possible inconsistencies and interdependencies between them.

It would also be interesting to assess the clients' response to this list. Whether they agree or disagree and whether there is any issue which stems any kind of discussion leading to a deeper understanding of the ISS outsourcing relationship.

Several issues have surfaced in the course of this study that may constitute additional work proposals to researchers intending to pursue the topic of ISS outsourcing.

It would be worth to inquire deeper into the aspects that are paramount in winning the client and on the aspects that are paramount in retaining the client. This would help to better understand which aspects are relevant in setting the ISS outsourcing relationship and then in maintaining it.

A second issue is the maturity level of organizations and how it conditions the success of outsourcing relationships at large and ISS outsourcing relationships in particular. Can an organization that does not

know itself well be successful in outsourcing any IS function? A related idea would be to study to which extent is the price the dominant factor in resorting to ISS outsourcing and how this relates to the maturity of the organization and its dependence on IS.

Another issue that emerged from this study is about the ISS outsourcing contract. Which is the current state of these contracts and are they generic or specific, helpful or not, and are they effective management tools, litigation instruments or are just ignored?

Lastly, the granularity and overlapping of key issues was a topic of debate during the interviews. Would it be possible to develop a set of key issues balanced in their intrinsic dimension and independent so that a provisional deductive-nomological model may be developed?

These are questions worth pursuing so that we can better understand the perspectives of both parties involved in an ISS outsourcing relationship and to improve the chances of it being successful.

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