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IT/IS Outsourcing in Large Companies – Motivations and Risks

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Abstract

Companies can outsource Information Technologies (IT) /Information Systems (IS) at various scales, from a small percentage of services to the entire range of services that they need. Outsourcing is associated to a set of motivations related to perceived benefits, but it also has inherent risks. This paper discusses the main results of a survey carried out to determine several aspects of outsourcing practice in large companies. It presents the most frequently contracted services (application development and application maintenance), the most prevailing motivations (financial motives and access to world-class capabilities) and the main risks (loss of control, loss of intellectual capital, and unexpected costs), as perceived by companies.

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1. Introduction

Products and processes are becoming increasingly more complex, markets are more and more dynamic, customers' needs are rapidly changing, competition has intensified: this economic environment claims for a shortening of the time required to design, develop and manufacture a product, and claims simultaneously for cost reduction, increased reliability, quality improvement and sustainability. Thus, firms are implementing a wide variety of different techniques, management processes and development strategies in their quest for a closer alignment with the market requirements.

Knowledge and resources required by most of the products do not always exist inside the walls of the organization, and companies look for cooperation with others by buying components, creating strategic business alliances or joint-venture associations, or by outsourcing[1,2]. The growth of outsourcing in the eighties was the first signal that the traditional hierarchical corporate model (mega vertically integrated enterprises) was breaking down[3]. Initially, outsourcing was generally used with relatively simple products and services, mostly because of transaction costs[4,5]. Information Technology (IT)/Information Systems (IS) recent developments, that allowed organizations to be integrated electronically, have significantly reduced the transaction costs, enabling organizations to focus on their core competencies and to buy from the exterior non-core products and services[6,7,8].

A competitive and successful organization is one that proves itself able to make the most of its assets and its main competencies, concentrated on its core business and carrying out the outsourcing of peripheral activities[8]. This strategy allows keeping control of their internal core competencies while gaining benefits from the use of resources and expertise of its suppliers[9]. The success of virtually any organization in a global environment goes directly to the rational management of the activities considered essential to its business and to the ability in obtaining the remaining needed services from entities, both domestic and foreign. These entities are more capable to perform those services with maximum efficiency and effectiveness. Economic principles many times determine the outsourcing decision making; companies allocate their resources within the value chain to the activities and this allows them to have a comparative advantage, whilst other activities are outsourced to external suppliers or partners[10].

Since its beginnings, IS/IT outsourcing was taken in as a cost-cutting tool, nevertheless it has evolved into an integral component of a firm's overall information systems strategy[11,12]. Today this subject is among the major concerns of IS executives and will likely continue to be a hot topic and a major determinant of the future of IT. As outsourcing can be found in the multifaceted life of organizations, there is an interest in understanding the key drivers and the role it currently plays in the structure of the IS/IT departments.

Outsourcing has become a major component of information technology strategy in many companies around the world[93]. Literature is rich in studies on outsourcing (onshore and offshore) adoption in different countries for the last twenty years (see[11,13,14,15,16,17,18,19], just to mention a few). Several studies argue that local cultures influence organizations in the adoption of technologies, in the use of IT products and services, and also in the way IT work is done[20,21]. Erumban and Jong[22] suggest that the national culture and the IT/IS adoption rate of a country are closely related. Also a study by van Everdingen & Waarts[23] on ERP software adoption on ten European countries, revealed that variables describing national culture have a significant influence on the country adoption rates. In a study on IT supported Collaborative Planning Forecasting and Replenishment in several countries involving a U.S. supplier and retail partners in U.S., Germany, China, and Poland, cultural differences have been shown to affect operations management processes[24].

This article presents a look on the Portuguese outsourcing panorama, through the results of a study conducted among large companies in order to depict the IT/IS services that are more contracted and the motivations and risks perceived by Chief Information Officers (CIO) concerning to outsourcing.

This research makes three contributions to the literature: (1) it helps managers and CIOs to understand the main opportunities and risks of IT/IS outsourcing based on the experience of other enterprises; (2) on vendor enterprises point of view, it provides guidance that helps to define their strategic plans regarding the most contracted services; and (3) provides information to allow comparative local studies.

In the next section is presented a brief literature review on IS/IT outsourcing, followed by the research process. Subsequently, the obtained results are presented and discussed in section four. Finally, the last section makes some concluding remarks and future research.

2. Background

The outsourcing of IT/IS services consists generally in the hiring of external entities (vendors) to satisfy internal needs of companies. An organization can outsource a wide range of IT/IS services, which can be hired either individually or together to the same vendor or to different vendors, onshore or offshore[25,26]. In fact, there is a multitude of IS-sourcing options[27]. Onshore outsourcing (also called domestic outsourcing) means the obtaining of services from a company within the same country[28]. Offshoring of services can be defined as the relocation to foreign countries of services that have been performed in the home country[31]. Based on several sources[29,30,32,33,34,35,36,37] it is possible to identify the following services as those most commonly subject to outsourcing: Data Center management; Development and maintenance of systems; Network management; Microcomputer; Systems integration. Besides these, there is a myriad of other services, for instance, user support, disaster recovery, Internet services, training, etc.

To claim that the literature offers multiple lists of benefits associated with outsourcing is clearly insufficient, given that the diversity of proposals that can be found is significant. References vary in detail and organization[37]: from simple not organized lists[38,39,40,41], to lists organized by strategic and tactical objectives[42,43,44,90], or even lists organized by benefit categories[30,32,45].

Organizations proceed to IT/IS outsourcing services for multiple and not always the most obvious reasons[46]. This way, each organization is responsible by identifying the reasons why it decides to go for this solution[30], and so a company has to understand and to have a clear conceptual framework of the outsourcing decision[10,12,47].

The cost reductions are often cited as one of the main drivers of the outsourcing decision[37,40,41,45], at the same time they are the reason most commonly found; but there are many other relevant reasons to be considered[48].

Table 1 presents the main outsourcing drivers (or main expected benefits), based on literature, which were the basis for the motivations used in this research.

Table 1. Main drivers for outsourcing

Main drivers for outsourcing	References
cost reductions	[27;37;40;41;43;44;45;48;49;50;51]
focus on core business / core competences	[37;43;48;49;50;51;52;90]
access to world-class capabilities	[37;43;44;53;90]
sharing of risks and benefits	[37;43;54;90]
free resources to other internal services/tasks	[37;43;44;51;52;53;55;90]
seek capital inflows	[37;90]
obtain resources not available internally	[27;37;43;44;48;51;52;55;56;]
transfer a function difficult to manage	[37;43;55;57]
avoid technological obsolescence	[37;44;56;58]
maintain or increase flexibility	[27;37;44;49]
improve IS management	[37;58;90]

There are, surely, many advantages associated with outsourcing, but there are also significant threats and risks. Outsourcing arrangements do indeed entail risks which can lead to negative outcomes[59,81].

It is easy to overestimate the outsourcing benefits [14], so the potential risks have to be taken in account in the outsourcing decision process[60,61], since the inadequate risk management is a major reason for failing the accomplishment of the sourcing goals[91]. Since mid-nineties that authors have invested in identifying IT/IS outsourcing risks, risk models, and risk management. Literature offers a large number of research papers with a very high number of citations, like for example[62,63,64,65,66,67,68,69,70,71], providing a wide collection of risks, disablers and threats related to IT/IS outsourcing. From the analysis of significant literature, the items of table 2 were considered in our study, as the main outsourcing risks.

Table 2. Main outsourcing threats and risk factors

Main threats and risk factors	References
loss of control of IS assets (that result in loss of flexibility)	[12;30;34;37;62;72;90]
loss of IS management capability	[41;62;72;73;90]
the threat of opportunism by vendors	[34;37;72;74;75;90]
loss of capacity and organizational knowledge	[58;72;75;90]
decline in morale and performance of internal human resources	[37;48;67;73;76;77;90]
cost reductions that fail to materialize	[32;37;38;72;77]
targets that are not achieved	[72;73;74]
contracts that cannot be changed without penalty	[58;62;74;75;78;79; 80]
decreased quality of service	[37;40;58]
incompatibility of cultures	[32;37;84;91]
loss of intellectual capital due to loss of key people in the IS function	[37;48;75]
greater management effort	[37;38;82;83]
decline in service levels	[37;49]
loss of technological capacity	[37;66;67;74]
internal resistance	[37;72]
considerations of security and data confidentiality	[34;37;67;74;75]

3. Research method

We carried out a survey in order to characterize several aspects of IT/IS services outsourcing, with the participation of various Chief Information Officers (CIOs) of the largest Portuguese companies concerning turnover. In particular, the study aimed at identifying the main motivations and risks that are commonly present in the outsourcing decision.

It was used an online questionnaire based on the drivers and risks identified in the previous section (summarized in tables 1 and 2). A call for participation was sent via e-mail and posted to a stratified random sample of 200 CIOs from the 1,000 largest Portuguese companies in terms of turnover (according to the Portugal's National Statistics Institute). Thirty-six responses were received and, of these, eight of them were rejected due to a significant number of issues which have been left blank, resulting in a total of 28 valid responses (not anonymous), corresponding to a response rate of 14%. Table 3 presents the main characteristics of the participating companies in the study.

4. Outsourcing in Portuguese companies

Around 96.4% (27) of the companies participating in the study turn to outsourcing to obtain a significant portion of its IT/IS services, spending on average 46% of its budget for IT/IS in outsourcing services. Twenty-one per cent (21%) of these companies hires IT/IS offshore outsourcing services.

4.1. Main Services Outsourced

Aiming at identifying which IT/IS services are more often outsourced, participant CIOs were asked to indicate the percentage of outsourcing for each type of service. The services identified were: Microcomputer management; Technical training to internal IT staff; Data centre management; Consulting services; Helpdesk; User training; Network Management; Security management; Platforms and communications services; Web services; Application development; Application maintenance; Project management; E-mail and messaging services; Systems integration; Disaster recovery management. Figure 1 presents the obtained ranking of the main services outsourced, sorted by relevance.

Table 3. Characteristics of responding organizations

Turnover of the participating companies (euros)	Percentage
Less than 50 million	25%
From 50 million to 250 million	43%
More than 250 million	14%
Unidentified	18%

Number of IT end users	Percentage
1 – 50	21%
51 – 200	43%
201 – 500	11%
501 – 2,000	18%
Over 2,000	7%

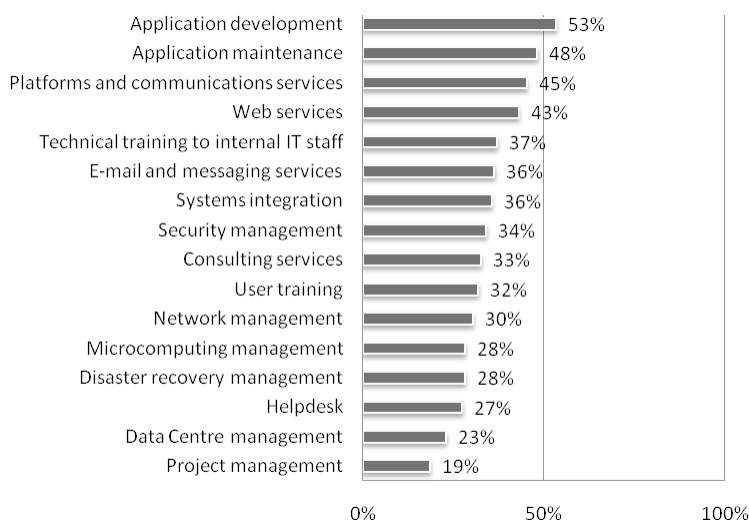| Budget of the IS/IT department or similar (euros)	Percentage
Less than 200,000	32%
From 200,000 to 1,000,000	29%
From 1,000,001 to 5,000,000	21%
More than 5,000,000	7%
Unidentified	11%

Fig. 1. Average outsourcing of Information Systems Services[81]

4.2. Motivations for Outsourcing

The motivations for outsourcing may be several, like, for instance, cost reduction, focus on core business, or reducing the risk of obsolescence of IT, as identified in the previous section.

Over the last decades of outsourcing practice, literature confirmed that some motivations have remained at the top of the most important (reducing costs for example), while others have gained importance (for instance, focus on core business). In order to identify the motivations currently prevailing in outsourcing, participants were asked to rate the reasons presented in table 4 (which were based on the main motivations and drivers identified from literature and presented in the second section), using an ordinal scale.

Table 4. Motivations for outsourcing

Code	Description
M1	Cost reduction
M2	Cost control
M3	Obtain capital through the sale of internal resources
M4	Reduction of the need for investment
M5	Redirection of resources
M6	Alignment of resources needs with its acquisition
M7	Improving the company's accounting balance sheet
M8	Access to world-class capabilities
M9	Focus on core business
M10	Increase of business flexibility
M11	Risk sharing
M12	Obtaining resources not available internally
M13	Process improvement
M14	Organizational structures changes
M15	Improvement of information systems management
M16	Access to cutting-edge technologies
M17	Access to technical proficiency and specialized human resources
M18	Political motivations
M19	Access to business expertise

Figure 2 presents the ranking of the main reasons for large companies to outsource services. A reason ranked as the first most important by all the inquired CIO would correspond to 100%; for each reason the percentage is calculated proportionally. In most companies, the prevailing motivations are "access to world-class capabilities" and "cost reduction", followed by "access to technical proficiency and specialized human resources" and "cost control".
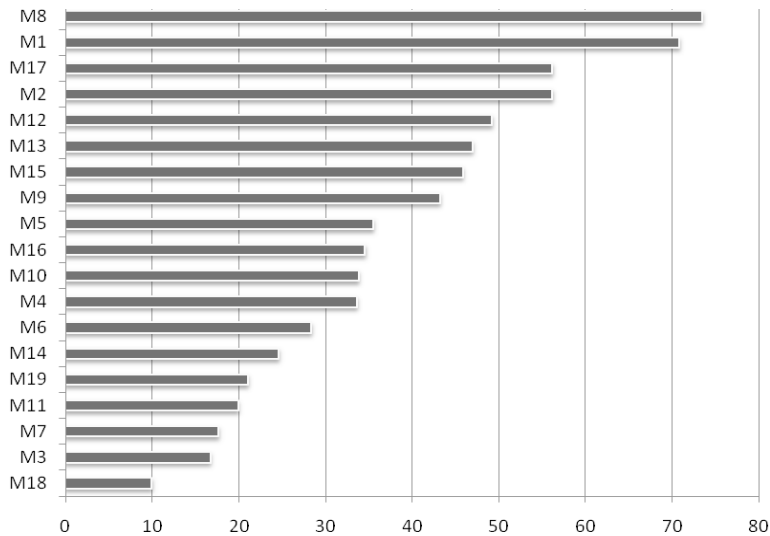

Fig. 2. Motivations for IT/IS outsourcing (in percentage)

To study if the motivations for outsourcing could be explained by a smaller number of variables, it was performed a Principal Component Analysis. As presented in table 5, five components can explain 71.109% of the cases.

Table 5. Total variance of motivations explained (using Principal Component Analysis)

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	6.483	34.124	34.124
2	2.599	13.681	47.804
3	1.982	10.434	58.238
4	1.273	6.700	64.938
5	1.173	6.171	71.109
6	.967	5.089	76.198
7	.901	4.740	80.938
8	.785	4.129	85.067
9	.587	3.092	88.159
10	.531	2.797	90.956
11	.416	2.191	93.147
12	.376	1.981	95.128
13	.345	1.817	96.945
14	.224	1.178	98.123
15	.115	.608	98.731
16	.107	.563	99.293
17	.062	.328	99.622
18	.054	.283	99.905
19	.018	.095	100.000

Table 6 shows the rotated component matrix for the five components. The rotation method used was the Varimax method with Kaiser Normalization; rotation converged in 19 iterations.

The first is a component in which prevail financial issues. This can be explained by the fact that aspects like cost reduction, cost control, obtain capital, reduction of the need for investment, alignment of resourced needs with its acquisition and increase of business flexibility, are all between the most mentioned motivations for outsourcing since the beginning of the outsourcing phenomena.

The second component is formed by access to world-class capabilities aspects, together with access to technical proficiency and specialized human resources. Since most of the times it is not feasible for companies to have all their resource needs inside their walls, it is effective to get them from outside vendors.

The third component is characterized by political motivations and also by access to business expertise. Political motivations are sometimes powerful reasons for top management to solve existing problems regarding information systems management. Outsourcing is also an excellent management tool to access expertise not available inside the company.

The forth component is formed by improvement of information systems management and process improvement. By outsourcing part of the IS services, the company can improve the IS function structure and the implemented processes.

Finally, the fifth component is about organizational structures changes. The contracting of service enables the reduction of internal structures or the reallocation of resources.

As mentioned before, the motivations of operational nature were often prevalent in the past. The results from this study show that this type of motivation is still at the top of the motivations; however more strategic motivations also gained importance.

Table 6. Rotated component matrix – motivations

	Component				
	1	2	3	4	5
M1	**.748**	-.135	-.250	.145	-.167
M2	**.749**	-.027	-.021	.352	.000
M3	**.718**	-.147	.249	.044	.079
M4	**.790**	-.096	-.084	.102	.236
M5	.670	-.292	.372	.053	.094
M6	**.705**	.170	.321	-.211	.100
M7	.663	-.052	.189	.188	.364
M8	-.015	**.789**	-.021	.402	-.198
M9	.547	.151	.122	-.257	.555
M10	**.808**	.161	.330	-.008	.124
M11	.662	.077	.225	.176	.122
M12	.183	.477	.434	.152	-.474
M13	.123	.174	.374	**.695**	.162
M14	.338	.103	.182	.200	**.741**
M15	.219	.038	-.070	**.843**	-.027
M16	.048	.669	.215	-.412	.371
M17	-.185	**.826**	.029	.026	.140
M18	.049	.017	**.821**	.175	.271
M19	.377	.118	**.728**	-.096	-.077

4.3. Outsourcing Risks

This study also aimed at identifying the main perceived risks of outsourcing, therefore the participants have been asked to rate the risks presented in table 7 using an ordinal scale.

Figure 3 presents the ranking of major risks perceived by the companies. It is possible to analyze that the major emphasis is given to the risk "loss of control in fundamental processes for the business", identified by many participants. This is an important risk that needs to be seriously evaluated. A service that is not considered core competence of a company, in a specific time, can later turn into a core competence due to changes in the business environment.

A cluster analysis was obtained for variables Rn. The extraction method used was Principal Component Analysis and, as presented on table 8, six components can explain 75.678% of the occurrences.

Table 7. Risks of outsourcing

| Code	Description
R1	Resistance to internal change
R2	Increased management effort
R3	Loss of control in fundamental processes for the business
R4	Loss of control of the business management/strategy
R5	Control loss on the information technologies' management/strategy
R6	Loss of intellectual capital
R7	Loss of competencies and skills in information systems
R8	Decrease of service quality
R9	Loss of flexibility to attend new needs
R10	Unexpected costs
R11	Problems of motivation of internal human resources (decline in morale)
R12	Not benefiting from eventual cost reduction of physical resources due to celebrated contracts
R13	Service subcontracting by part of the suppliers
R14	Cultural barriers and customer relationship
R15	Conflict of interests between client and supplier
R16	Lack of business knowledge about the business by the supplier
R17	Selection of a supplier that does not own the necessary competences
R18	Leakage of security about confidential information and business data
R19	To stay tied to suppliers in a dynamic market
R20	Exposition to the supplier's risks of instability
R21	Dependence on the supplier and threat of opportunism
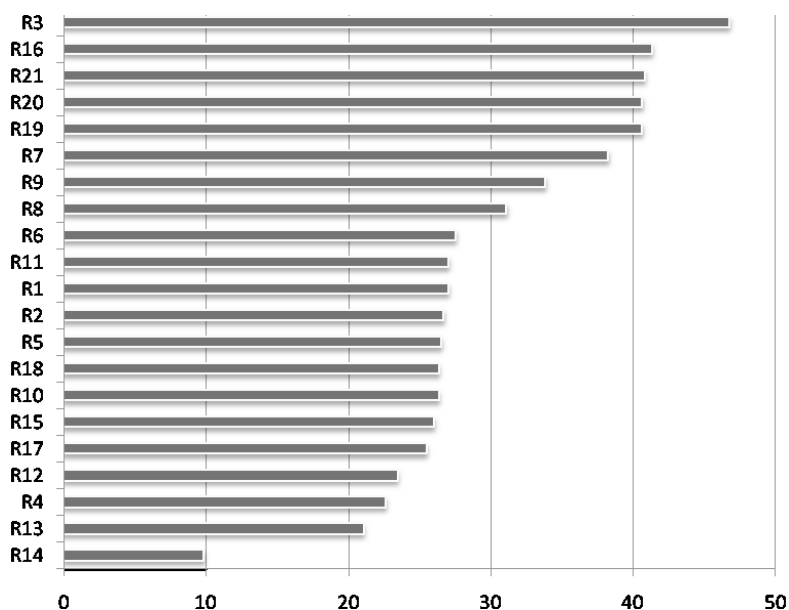
Fig. 3. Outsourcing risks (in percentage)

Table 8. Outsourcing risks explained (using Principal Component Analysis)

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	7.276	34.648	34.648
2	2.352	11.202	45.850
3	1.905	9.073	54.924
4	1.725	8.214	63.138
5	1.350	6.426	69.564
6	1.284	6.114	75.678
7	.957	4.556	80.233
8	.721	3.436	83.669
9	.644	3.068	86.737
10	.627	2.984	89.721
11	.490	2.336	92.056
12	.395	1.881	93.937
13	.292	1.389	95.326
14	.277	1.317	96.643
15	.205	.978	97.621
16	.192	.912	98.533
17	.144	.686	99.220
18	.068	.323	99.543
19	.052	.247	99.790
20	.036	.173	99.963
21	.008	.037	100.000

Table 9 shows the rotated component matrix for the six components. The rotation method used was Varimax with Kaiser Normalization; rotation converged in 8 iterations.

In the first component prevails the loss of control and the loss of intellectual capital, which are closely related. By outsourcing some services to external vendors, companies fear losing some important internal assets. Several contract characteristics like long term ones, can restrain the company action resulting in consequences like loss of control in fundamental processes for the business or loss of control of information technologies management or strategy.

The second component is mainly related to unexpected costs. These costs can be explicit, like costs related to the management of contracts that may not be considered when the outsourcing was evaluated, or can be implicit, resulting on difficulties caused by cultural barriers.

The third component is related to the exposition to the supplier's risk of instability. When a company outsources a significant part of their service needs it can become dependent, at least at some extent, to the vendor's performance. If a vendor faces difficulties, that can mean an underperformance in their services, which can affect the client company.

Component four is about the decrease of service quality. This is a risk and an effective problem referred by client companies in several occasions. The reasons leading to a decrease of service quality by suppliers can be numerous, although many times it derives from the extensive use of resources by the vendors, which do not prepare their structures

for an effective response to peaks of demand. In other circumstances, the use of cheaper resources, with less experience in the accounts of "less important" customers, result on a quality decrease.

Component five concerns the internal resistance to change. The outsourcing initiatives are always moments of change, that need to be well managed with adequate communication strategies to reduce resistance.

Finally, component six is related to the suppliers' lack of knowledge about business by the suppliers. One of the main problems in outsourcing of some types of services is the lack of business expertise by the vendor, which can constrain the performance and quality of the performed services.

Table 9. Rotated component matrix – outsourcing risks

	Component					
	1	2	3	4	5	6
R1	.040	.183	.096	.173	**.929**	.104
R2	.273	.189	.429	.300	.321	-.582
R3	**.813**	-.090	.119	.316	.036	-.212
R4	.584	.355	-.075	.019	.587	-.080
R5	**.862**	.172	-.132	.027	.197	.058
R6	**.786**	.412	.033	.189	-.121	.066
R7	.324	.580	.058	.453	-.074	-.210
R8	.085	.127	.025	**.769**	.144	.152
R9	.110	.534	.110	.606	.233	.220
R10	.206	**.698**	-.050	.128	.212	.148
R11	.024	.388	.208	.594	.326	-.029
R12	-.070	**.743**	.326	.037	.225	-.041
R13	.254	.174	.063	.376	.691	.250
R14	.181	**.748**	.098	.209	.048	.000
R15	.630	-.040	.403	-.184	.229	.140
R16	-.011	.126	.050	.121	.192	**.805**
R17	.224	-.109	.243	.405	.096	.606
R18	.082	.553	.577	-.016	.233	-.042
R19	.600	.397	.380	-.054	.156	.367
R20	-.113	.007	**.747**	.437	.038	.045
R21	.173	.215	**.900**	-.001	-.045	.086

5. Discussion and conclusions

This paper contributes to the existing literature on IT/IS onshore outsourcing. By gathering results that are interesting to complement the more or less known worldwide view of the subject, it represents simultaneously a useful source of information for managers and IT professionals in their assessment of outsourcing risk and motivations. A similar study was undertaken by the authors for offshore outsourcing, and some results were coincident, for instance, the most outsourced services are nearly the same[85].

The outsourcing of IT/IS services is now a well-established practice and used by companies all around the world. It has become one of the management tools most used, being regarded by many researchers as one of the cornerstones of management and modern economy practices for two decades (e.g. [40,46,47,86,87,88,89]).

The benefits and risks of outsourcing rely largely on the degree and type of outsourcing considered, technology and outsourced services, the institutional characteristics and culture of the organization[32], and this was a major concern of our study. Larger Portuguese companies outsource a significant portion of their total service needs (on average about 46%) to external vendors.

The prevailing motivations in our study are the financial issues followed by the access to expertise that companies do not have internally, and IS management improvement. With regard to perceived risks, our study highlighted the loss of control in fundamental processes for the business, followed by fear of unexpected costs, exposition to the supplier's risk of instability and decrease of service quality.

Besides the small size of the sample, which can be considered one limitation of the study, the most relevant motivations and risks identified converge towards those of the other studies, which give some security about the same for the western economies where the mentioned studies were performed.

A further effort of research would be to analyze the effects of outsourcing on firm performance, aiming to understand the extension or the impact of motivations, as well as the loss of competitiveness or of performance associated with the risks. The paper highlights the main benefits and risks involved in IT/IS outsourcing as perceived by large enterprises; however, and as suggested by Beasley *et al.*[92], there still remains some uncertainty about the value-added by outsourcing. Although the study recognized the benefits such as cost reduction, quality improvement, etc., they should be pondered against the risks created, in order to allow a more supported decision making for the question of making in-house or outsourcing.

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