



# A comparative study of important risk factors involved in offshore and domestic outsourcing of software development projects: A two-panel Delphi study

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## ABSTRACT

We investigated the risk factors of outsourced software development. Our first objective was to create empirically generated lists of risk factors for both domestically- and offshore-outsourced projects. Our second objective was to compare these two contexts: how do the risk factors change and which ones are most important in each. To address these objectives, we conducted two Delphi surveys to identify the important risk factors from a client perspective, in domestic and offshore settings. We qualitatively compared the results of the surveys to identify similarities and differences across their risk profiles. We identified three types of risks: those that appeared in both contexts; those that appeared in both but were exacerbated in the offshore context; and those that were unique to the offshore context. Our findings suggested that traditional project management risks were important in both contexts; however, the offshore context seemed to be more vulnerable to some traditional risks as well as factors that were unique to it.

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IT outsourcing may occur in the same country or offshore. In the late 1990s American companies witnessed the rapid growth of offshore outsourcing due to the lower labor costs and an acute shortage of programmers in the USA. Another important factor was the improvement in telecommunications technology and emergence of the Internet.

Unfortunately, for many companies, the expected benefits of outsourcing have failed to materialize. It appears that half of offshore outsourcing initiatives “fail” or do not meet stated performance objectives. Reasons for this include: the inability to navigate difficult organizational and cultural barriers; middle-management resistance and failure to communicate—to provide clear, succinct statements of requirements and manage the process from afar. In short, many outsourced projects are mismanaged and the risk factors of these projects are poorly understood.

Our study attempted to determine the most important outsourcing risk factors. Our first objective was to create empirically validated lists of the most important risk factors. Second, we wanted to find out how domestically outsourced projects differed from offshore ones. It is obvious that it is more difficult to maintain control over long distances and with destinations having different cultures, laws, and languages.

To address these objectives, we conducted two Delphi surveys to identify the important risk factors, from the client perspective, in domestic and offshore outsourcing settings. Also, we qualitatively compared the results to identify the similarities and differences across their risk profiles.

## 1. Background

Software project failure has been studied extensively in the IT project management literature. To address this issue, scholars have spent considerable time identifying risk factors. IT project risks frequently materialize in delays, resource overruns, and project abandonment. Such problems reduce the net benefits that a client organization reaps from the use of IT.

A common method of identifying and managing risk is through the use of checklists. In the project management literature, there are a number of checklists that have been made available to help with this task (see e.g., [3]). In order to provide some sense and order to the myriad types of risks, Wallace et al. [30] categorized the risk factors along six dimensions. We employ this categorization in Table 1. These risk factors can be found in all types of IT projects.

In more recent years, a number of checklists have been developed for outsourced software development. We summarized these in Table 2. For example, Earl [9] identifies 11 risks of outsourcing. Although he includes some risk factors related to short-term implementation issues, his discussion is focused on long-term implications (termed *Strategic Risks*).

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**Table 1**  
Risk factors from IT project management literature.

| Category                   | Risk examples                                                                                                                                                  | Representative references |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Team-related               | Staff turnover<br>Lack of team communication<br>Lack of required technical and business knowledge<br>Lack of motivation<br>Team conflicts                      | [5,25,26,30]              |
| Organizational environment | Lack of top management support<br>Organizational politics<br>Stability of organizational environment<br>Changes in organizational priorities                   | [14,26,28]                |
| Requirements               | Original set of requirements is miscommunicated<br>Continually changing system requirements<br>Unclear system requirements                                     | [7,25,26,28]              |
| Planning and control       | Lack of project management know-how<br>Poor planning of schedules and budget<br>Poor change controls<br>Failure to consider all costs                          | [2,26,28,29]              |
| User-related               | Lack of adequate user involvement<br>Failure to gain user commitment<br>Failure to manage end-user expectations<br>Conflicts between user departments          | [25,26,30]                |
| Project complexity         | Difficulties with integration<br>Large number of links to other systems<br>Processes being automated are complex<br>Inadequate understanding of new technology | [9,15,26,29,30]           |

Some recent frameworks are more focused on the offshoring context. Rao [24] explored issues about doing business overseas, and discussed factors from the availability of telecommunications infrastructure to cultural differences and language barriers, as well as legal and regulatory challenges of conducting business elsewhere. Kliem [16] discussed factors that are applicable only to the offshoring context, such as import–export restrictions (trade barriers), political instability, language barriers, cross-national cultural issues, and currency exchange fluctuations.

From these frameworks, it is obvious that there is overlap in the risk factors. Taken together, they delineate the wide variety of risks that can serve as useful guidelines for managing IT outsourced projects. However, they are limited: they are based on anecdote and speculation, and often lack any validation; nor are they ordered in importance. A second limitation is that there is little cross-fertilization between the outsourcing and software project management literatures.

Schmidt et al. [26] generated an empirically validated list of the important risk factors in software development projects. They employed a Delphi survey to produce a rank-order of risk factors. In their final list, they created 14 categories, including corporate environment, sponsorship/ownership, relationship management, project management, scope, requirements, and funding. We utilized these findings as a baseline for our empirical work and employed the Delphi technique with two groups of outsourcing experts: domestic and offshore. At the outset, we assumed that there would be some common risk factors across both types of projects. At the same time, we predicted that there would be issues unique to each type of outsourcing. An important objective of our study, then, was to discover how outsourced projects differed from generic projects, and what risk factors were most important to IT managers in each type of outsourcing.

## 2. Research method

To execute our study, we assembled two panels of experts with significant experience in managing outsourced projects, both domestic and offshore. One was asked to identify the critical risk

factors that are likely to influence the outcome of offshore-outsourced projects [13]; the other was asked to do this for domestically outsourced projects. The input of the expert panels was collected using Delphi surveys.

### 2.1. The Delphi method

The Delphi technique allowed us to (1) capitalize on the diverse experience of the experts in identifying key risk factors and (2) identify the most important factors by facilitating convergence of the experts' opinions through controlled feedback.

We selected the Delphi method for two reasons. First, prior research has not yielded a set of validated measures of the construct of interest (project risks). Second, because we were interested in generating findings that would be generalizable, we did not feel that case studies or field interviews were feasible given our available resources. The Delphi method provided a good solution that allowed us to conduct our investigation with rigor and internal consistency, while allowing us to produce results efficiently and with external validity.

To execute the study, we followed the normal multi-round methodology. During Round 1, we asked the experts to identify the important risk factors that influence outsourced IT project outcomes. In subsequent rounds, their responses were summarized and disseminated anonymously to the panel. To achieve consensus, participants were asked to consider revising their earlier input after reviewing the feedback of their peers.

### 2.2. The panels of experts

The quality of the panels of participants was, of course, of paramount importance. We recruited individuals from whom companies usually seek advice when dealing with projects: experienced IT project managers of organizations that engage in outsourcing. Our sampling frame consisted of qualified members of the Project Management Institute (PMI).

We established *a priori* minimum qualifications to identify qualified participants. Specifically, participants were required to

**Table 2**  
Risk factors from IT outsourcing literature.

| Category                        | Risk examples                                                                                                                                                                                                                                        | Representative references |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Client capabilities             | Lack of experience with outsourcing<br>Lack of experience with project management<br>Lack of experience with contract management                                                                                                                     | [8,9,27,28]               |
| Vendor capabilities             | Inadequate staffing by vendor<br>Lack of business know-how<br>Lack of technical know-how<br>“Shirking” or deliberate underperformance by the vendor                                                                                                  | [1,8–10,28]               |
| Vendor–client communications    | Poor communications caused by geographic distance<br>Language barriers<br>Cross-national cultural differences <sup>a</sup><br>Time-zone differences                                                                                                  | [1,24,25,27]              |
| Contract management             | Tendency of vendor to initially oversell to win client's business<br>Lack of precise and detailed specifications<br>Failure of vendors to deliver on their promises                                                                                  | [2,28,29]                 |
| Strategic risks                 | Vendor lock-in<br>Over-reliance on a vendor<br>Loss of control over strategic assets<br>Loss of innovative capabilities<br>Lack of organizational learning                                                                                           | [1,2,8,9,12]              |
| Legal/regulatory                | Disputes regarding contractual obligations<br>Different tax and labor laws <sup>a</sup>                                                                                                                                                              | [2,4,16,24]               |
| Security                        | Theft of intellectual property<br>Vulnerability of strategic information<br>Data privacy issues                                                                                                                                                      | [1,4,10,24,27]            |
| Financial                       | Failure to consider hidden costs of outsourcing<br>Currency fluctuations <sup>a</sup>                                                                                                                                                                | [1,4,8,9,10]              |
| Geopolitical                    | Political instability <sup>a</sup><br>Trade barriers <sup>a</sup><br>Border tensions between two countries <sup>a</sup>                                                                                                                              | [1,16]                    |
| Firm reputation/employee morale | Anger among Americans workers for exporting their jobs overseas <sup>a</sup><br>Loss of employee morale<br>Opposition of the IS staff                                                                                                                | [4,10]                    |
| Technology risks                | Unreliability of a country's telecommunications infrastructure <sup>a</sup><br>Lack of adequate security technologies (e.g., firewalls, encryption, etc.)<br>Noncompliance with embraced development methodologies<br>Incompatible development tools | [4,16,24]                 |

<sup>a</sup> Denotes outsourcing risks applicable only to the offshore context.

possess Project Management Professional (PMP) certification, have 3 years of PMI membership, and be working as senior IT project managers with one of the following position titles: Manager, Director, Vice President or Chief Information Officer. After searching the PMI membership database, we identified 750 individuals who satisfied all of the criteria and 500 were randomly selected to receive a screening questionnaire on their relevant expertise. Fifty-seven managers responded to our request (a 12%

response rate, after accounting for 13 questionnaires returned as undeliverable). Three indicators were used to assess their experience: the total number of projects that had been managed by the respondent over his or her career, the number of *outsourced* projects that he or she had managed (figures were collected for domestic and offshore projects separately), and years of project management experience. To ensure a minimum level of expertise, we disqualified any with less than 5 years of project management

**Table 3**  
Panel expert profile.

| Panel                                                      | Offshore outsourcing | Domestic outsourcing |
|------------------------------------------------------------|----------------------|----------------------|
| Size of panel                                              | 15                   | 17                   |
| Average IT experience (years)                              | 17                   | 21                   |
| Average project management experience (years)              | 15                   | 15                   |
| Average project management experience (number of projects) | 51                   | 27                   |
| Industry affiliation                                       |                      |                      |
| Information technology                                     | 3                    | 2                    |
| Consultancy                                                | 3                    | 2                    |
| Non-for-profit organizations (includes universities)       | 2                    | 2                    |
| Government (state or federal agencies)                     | 2                    | –                    |
| Manufacturing                                              | 2                    | 4                    |
| Financial services                                         | 3                    | 2                    |
| Medical/Pharmaceuticals                                    | 1                    | 2                    |
| Other services (includes telecommunications)               | 1                    | 1                    |

experience and also disqualified those who had not managed six or more projects.

After screening the profiles, we selected 32 to participate on our 2 panels. For experts on the offshore panel, we focused on those who had managed the largest number of offshore-outsourced projects. We followed a similar approach for selecting the members of the domestic panel.

Fifteen of the selected panelists were assigned to the offshore panel, while the other 17 were assigned to the domestic panel. Offshore panelist had managed, on average, 8.5 offshore-outsourced projects while domestic panelist had, on average, managed 8.7 domestically outsourced projects. This level of experience suggested that the panelists were well-qualified. Additional information is provided in Table 3.

### 2.3. Data collection

A three-round process was utilized to collect the input of the experts.

#### 2.3.1. Round 1—discovery of risk factors

A Delphi questionnaire was mailed to the selected participants. This asked them to identify the most important risk factors that could influence the outcome of the project; specifically, the panel participants were asked to identify the most important risk factors that a project manager must pay attention to while managing an outsourced software development project. The offshore survey instrument defined offshore projects as “outsourced projects in which the development work is primarily completed abroad”, while domestically outsourced projects were those “in which the development work is completed in the United States”. The surveys identified project risk factors as “conditions that can present a serious threat to the successful completion of a software development project”. A copy of the Round 1 survey for the offshore panel is provided in Appendix.

In Round 1, the experts were asked to identify and justify at least six risk factors. Its goal was to discover the set of relevant, important risk factors. While the experts were free to specify any factor they deemed appropriate, we provided them with a list of the top 11 factors that had been previously identified.

Fifteen experts from the domestic panel and 14 from the offshore panel completed the Round 1 survey. After reviewing the inputs, we consolidated them into a set of unique risk factors. We did this separately for each context: offshore and domestic. This consolidation was conducted independently by the two authors. Any discrepancies were resolved through discussion. After the completion of this process, 25 risk factors were identified from those of the offshore panel and 20 from the domestic panel.

#### 2.3.2. Round 2—assessment of risk factors

The Round 2 instruments summarized the risk factors from Round 1. For each risk factor, a one-line description and a three-to-five line summary of the comments by participants were included. In this round, we asked the experts to confirm that the factors were consistent with their initial input and to evaluate them by importance in successful completion of the project. They were also asked to comment on each factor and to introduce others, if necessary. A 10-point importance scale was utilized, anchored as follows:

- very important (10)—the most relevant factor; it has direct bearing on the success of the project; must be addressed;
- important (7)—relevant factor; it would have significant impact on success but should receive lower priority;
- slightly important (4)—insignificantly relevant, having little importance; not a determining factor to the project and

**Table 4**  
Post-survey evaluation.

| Average ratings                      | Offshore panel | Domestic panel |
|--------------------------------------|----------------|----------------|
| Satisfaction with results            | 5.5            | 5.9            |
| Learning from others' feedback       | 5.4            | 5.8            |
| Ability to express ideas comfortably | 6.5            | 6.6            |

Note: The above indicators were assessed using a 7-point Likert type scale.

- unimportant (1)—no relevance; having no a measurable effect; should receive no priority.

Fifteen experts from the domestic panel and 11 from the offshore panel responded to the Round 2 questionnaire. After receiving their input, we calculated the average importance rating for each risk factor. The results of Round 2 were summarized and mailed to the participants as part of a Round 3 questionnaire.

#### 2.3.3. Round 3—validation of important risk factors

Round 3 questionnaires were customized for each participant; each questionnaire provided the participant's individual Round 2 rating and the panel's average rating for each risk factor. In Round 3, we asked participants to consider the input of their peers and to revise their importance ratings, if necessary. We also asked them to rate the effectiveness of the Delphi process as a way to express their opinions. Fifteen experts from the domestic panel and 12 from the offshore panel completed the Round 3 questionnaires. Consistent with prior research [6], we allowed panelists to participate in Round 3 even when they opted out of Round 2.

Overall, it appeared that the multi-round approach allowed participants to articulate the risk factors and reach agreement on their importance. Table 4 provides the results of a post-survey evaluation of the process by the panelists. They were satisfied with the results and found the process to be both appropriate and valuable.

In terms of agreement among experts, the average standard deviation for offshore-related risk factors in Round 2 was 2.1; this was reduced to 1.5 in Round 3. For domestic-related factors the standard deviation decreased from 1.7 in Round 2 to 1.3 in Round 3. Although these results suggest that consensus was still increasing at Round 3, we decided to conclude the study on completion of Round 3 for two reasons: first, there was no drastic movement of items between the top and bottom of the lists (from Round 2 to 3); to evaluate the level of agreement among the participants in Round 3, we calculated the Kendall coefficient of Concordance ( $W$ ) for each panel: for the offshore panel, the level of consensus was moderate-to-strong ( $W = 0.53$ ) and statistically significant ( $\chi^2 = 139, p < .001$ ); for the domestic panel, the level of consensus was also moderate-to-strong ( $W = 0.51$ ) and also statistically significant ( $\chi^2 = 145, p < .001$ ); second, we concluded that the improvement in consensus achieved by conducting additional rounds could not justify the burden placed on the busy, expert panelists.

## 3. Findings

Tables 5 and 6 summarize the average ratings of each panel during Rounds 2 and 3 (ratings range from “1—not important” to “10—extremely important”).

Because the aim of our work was to identify and compare the most important risk factors, we summarized the comments of the panelists on the top 10 risks in each group; see Tables 7 and 8. The descriptions of risk factors are similar across the two studies, but not identical. This is because the experts at times chose to focus on different aspects of a risk factor to suit the specific context.

**Table 5**  
Offshore panel ratings.

| Final rank | Risk factor                                                       | Round 2 average | Round 3 average |
|------------|-------------------------------------------------------------------|-----------------|-----------------|
| 1          | Lack of top management commitment                                 | 8.6             | 9.2             |
| 2          | Original set of requirements is miscommunicated                   | 8.2             | 8.1             |
| 3          | Language barriers in project communications                       | 7.9             | 7.7             |
| 4          | Inadequate user involvement                                       | 7.4             | 7.7             |
| 5          | Lack of project management know-how by client                     | 7.1             | 7.4             |
| 6          | Failure to manage end-user expectations                           | 7.4             | 7.3             |
| 7          | Lack of business know-how by offshore team                        | 7.1             | 7.3             |
| 8          | Poor change controls                                              | 6.7             | 7.3             |
| 9          | Lack of required technical know-how by offshore team              | 7.2             | 7.2             |
| 10         | Failure to consider all costs                                     | 7.0             | 7.1             |
| 11         | Telecommunications and infrastructure issues                      | 7.3             | 6.8             |
| 12         | Vendor viability                                                  | 6.4             | 6.0             |
| 13         | Difficulties in ongoing support and maintenance                   | 6.2             | 6.0             |
| 14         | Low visibility of project process                                 | 5.9             | 5.8             |
| 15         | Cross-national cultural differences                               | 5.8             | 5.8             |
| 16         | High turnover of vendor employees                                 | 5.7             | 5.8             |
| 17         | Constraints due to time-zone differences                          | 6.1             | 5.8             |
| 18         | Lack of continuous, face-to-face interactions across team members | 5.9             | 5.7             |
| 19         | Threats to the security of information resources                  | 5.8             | 5.3             |
| 20         | Negative impact on employee morale                                | 5.3             | 5.2             |
| 21         | Unfamiliarity with international and foreign contract law         | 5.0             | 4.8             |
| 22         | Differences in development methodology/processes                  | 5.3             | 4.8             |
| 23         | Political instability in offshore destinations                    | 4.5             | 4.4             |
| 24         | Negative impact on image of client organization                   | 3.2             | 3.1             |
| 25         | Currency fluctuations                                             | 3.1             | 2.8             |

## 4. Discussion

To organize the discussion of risks, we grouped the panelists' commentary into three themes:

1. Risks that appear in both offshore and domestic contexts (Generic).
2. Risks that appear in both contexts but are exacerbated in the offshore context.
3. Risks that are unique to the offshore context.

To aid in the discussion we created [Table 9](#), which compares the offshore and domestic risk factors. Eleven of the offshore risk factors do not appear in the domestic list (indicated by an asterisk).

Within each theme, comparisons across the domestic and offshore contexts are qualitative in nature. Our assessments incorporated commentary to illustrate the dissimilarities and commonalities across the settings.

**Table 6**  
Domestic panel ratings.

| Final rank | Risk factor                                      | Round 2 average | Round 3 average |
|------------|--------------------------------------------------|-----------------|-----------------|
| 1          | Original set of requirements is miscommunicated  | 9.4             | 9.4             |
| 2          | Lack of communication                            | 8.5             | 8.5             |
| 3          | Poor change controls                             | 8.4             | 8.5             |
| 4          | Lack of top management support                   | 8.6             | 8.4             |
| 5          | Lack of required technical know-how by vendor    | 8.4             | 8.3             |
| 6          | Lack of vendor commitment                        | 8.2             | 8.3             |
| 7          | Failure to manage end-user expectations          | 7.8             | 7.7             |
| 8          | Lack of project management know-how by client    | 7.8             | 7.7             |
| 9          | Inadequate user involvement                      | 7.9             | 7.6             |
| 10         | Inadequate staffing by vendor                    | 7.8             | 7.6             |
| 11         | Vendor viability                                 | 7.6             | 7.3             |
| 12         | High turnover of vendor employees                | 7.3             | 7.3             |
| 13         | Failure to consider all costs                    | 7.3             | 7.1             |
| 14         | Differences in ongoing support and maintenance   | 7.1             | 7.1             |
| 15         | Differences in development methodology/processes | 7.1             | 7.0             |
| 16         | Difficulties with integration                    | 6.6             | 6.6             |
| 17         | Lack of business know-how by vendor              | 6.3             | 6.4             |
| 18         | Lack of knowledge of new technology              | 6.4             | 6.3             |
| 19         | Conflicts between user groups                    | 6.5             | 6.1             |
| 20         | Negative impact on employee morale               | 5.8             | 5.9             |

### 4.1. Generic risk factors

Many of the same risk factors appear on both domestic and offshore lists. Moreover, they are at the top in terms of importance.

Most panelists thought that *lack of top management commitment* (#4 in the domestic context and #1 in the offshore context) was very important. One remarked: "If top management has not bought into the project it will be an uphill battle to keep the project on track because the project manager may find that the resources are being pulled off to do non-project related work." Issues related to managing the end-user relationship also have been discussed in the past and appear as high on both lists. Two related risk factors, *inadequate user involvement* and *failure to manage end-user expectations*, are also expected from prior discussions since the earliest days of IS development. Panelists in both groups felt that systems could suffer without adequate user involvement: "Inadequate user involvement often results in systems that are not responsive to user needs. Important business

**Table 7**  
Top offshore risk factors.

| Rank | Risk factor                                                                                                                                                                                                                                                                                                                                                                                        |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | <i>Lack of top management commitment:</i> Without meaningful support and commitment, projects face challenges that can lead to political battles, delays and even rejection. Support is essential in securing needed resources and cooperation across groups.                                                                                                                                      |
| 2    | <i>Original set of requirements is miscommunicated:</i> Ensuring that the developers and the end-users have a consistent understanding of the requirements can be a challenge in offshore development because of the reduced face-to-face, informal communications between these two groups.                                                                                                       |
| 3    | <i>Language barriers in project communications:</i> Language difference makes project communications difficult. Even when all parties speak English, there may be misunderstandings because of cultural assumptions. Also, slang terminology and accents can create problems and slow down communications.                                                                                         |
| 4    | <i>Inadequate user involvement:</i> Effective user involvement is critical. However, many offshore projects are stewarded by IS groups without participation by users. This can lead to conflicts, delays, etc.                                                                                                                                                                                    |
| 5    | <i>Lack of offshore project management know-how by client:</i> Offshoring is new to many companies. They do not have in-house expertise needed to monitor offshore work and to incorporate the new technology. Offshore development requires effective management of several specialized issues, such as the need to delineate responsibilities across the duplicate project management structure. |
| 6    | <i>Failure to manage user expectations:</i> Expectations must be managed to ensure that the project deliverables will be consistent with the perceptions of the users. This is a difficult task in all projects, but it is especially challenging in offshore situations because the users are not in direct contact with the developers.                                                          |
| 7    | <i>Poor change controls:</i> Changes to the initial set of requirements can cause delays, overruns, and other problems if they are not managed properly. Even when changes are documented and justified properly, there may be delays due to the exchange of questions and answers that must take place before the change is understood.                                                           |
| 8    | <i>Lack of business know-how by offshore team:</i> Frequently, overseas resources do not have an intimate understanding of the client's business context and don't get sufficient training on it. Lack of business know-how and lack of access to key business contacts (to get things done) can cause delays.                                                                                     |
| 9    | <i>Lack of required technical know-how by offshore team:</i> Ensuring that the development team consists of quality resources can be a challenge. Sometimes the skills and knowledge of offshore resources are misrepresented by vendors. In other situations, the level of technical sophistication in a country is lower than that of the USA, limiting the pool of expert resources.            |
| 10   | <i>Failure to consider all costs:</i> Typically, firms do not consider all the costs associated with offshore outsourcing. Many hidden costs can exist. For example, travel expenses for moving and hosting development resources on-site in the USA are often underestimated.                                                                                                                     |

needs are not addressed and the enterprise suffers from a lack of adequate systems." Managing end-user expectations was noted as a problem: "Users expect us to read their minds. Many see technology as 'magic' and once we have a system in place, it should be able to do everything. They rarely have a concept of what it takes for software to do certain tasks." *Lack of project*

*management know-how* was mentioned repeatedly. Some organizations do not have enough experience in managing outsourced initiatives: "Many organizations do not have the level of capability maturity in project management. As a result, the vendor tends to run the show—the 'tail wagging the dog'." A number of participants commented on project management

**Table 8**  
Top domestic risk factors.

| Rank | Risk factor                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | <i>Original set of requirements is miscommunicated:</i> Many misunderstandings can occur as a result of insufficient time being allocated upfront to ensure all parties understand the requirements. Vendor may not be able to interpret requirements properly due to lack of prior experience with the business, and lack of direct communications with the business.                                                                                               |
| 2    | <i>Lack of communication:</i> Excellent communication and negotiation skills are key to a project's success. Typically some face-to-face contact during the course of the project is helpful to both team building and relationship building. This may be less possible with projects that are outsourced.                                                                                                                                                           |
| 3    | <i>Poor change controls:</i> As a project moves forward, the boundaries have a tendency to expand. For example, management may redirect resources and/or scope during the project. There is a risk that the user will not accept the project due to impact of time, cost, and/or quality.                                                                                                                                                                            |
| 4    | <i>Lack of top management support:</i> If you do not have proper top management support the project may ultimately fail. Top management support is essential in securing the needed resources and cooperation among the organizational groups. For outsourced projects this is particularly important due to the complexity of managing these projects and the need for effective communications.                                                                    |
| 5    | <i>Lack of required technical know-how by vendor:</i> The level of technical sophistication may be misrepresented by the vendor organization. In addition, the vendor may lack extensive experience with software development projects. Some vendors may be capable of performing basic tasks, but cannot be relied on to perform more complex work.                                                                                                                 |
| 6    | <i>Lack of vendor commitment:</i> When the project plan is put together, there must be buy-in and sign-off by the vendor organization, otherwise the deadlines will never be viewed as a requirement.                                                                                                                                                                                                                                                                |
| 7    | <i>Failure to manage end-user expectations:</i> Users may have unrealistic expectations. Many see technology as "magic" and once a system is in place, they believe it should be able to do everything. They rarely have a concept of what it takes for software to do certain tasks.                                                                                                                                                                                |
| 8    | <i>Lack of project management know-how by client:</i> Many organizations lack adequate project management know-how and experience involving outsourced projects. One possible result is that the vendor tends to run the show—it becomes the case of the "tail wagging the dog". Another problem is that organizations may assume that existing in-house processes can be used for outsourced projects, when, in fact, additional controls and checks are necessary. |
| 9    | <i>Inadequate user involvement:</i> The business users and experts may not all be involved with the project. If the user community is not updated during, and following an implementation, the solution will not be accepted or utilized. For outsourced projects, users may not view the software development team as their team.                                                                                                                                   |
| 10   | <i>Inadequate staffing by vendor:</i> The vendor organization may not adequately staff a project (either not enough staff or inappropriate staff assigned—i.e., staff not fully qualified to develop the system). Also, training staff to maintain a system once it is in place is a critical issue.                                                                                                                                                                 |

**Table 9**

Comparing the offshore ranking to the domestic ranking.

| Offshore ranking | Offshore risk factor                                              | Domestic ranking |
|------------------|-------------------------------------------------------------------|------------------|
| 1                | Lack of top management commitment                                 | 4                |
| 2                | Original set of requirements is miscommunicated                   | 1                |
| 3                | Language barriers in project communications                       | *                |
| 4                | Inadequate user involvement                                       | 9                |
| 5                | Lack of project management know-how by client                     | 8                |
| 6                | Failure to manage end-user expectations                           | 7                |
| 7                | Lack of business know-how by offshore team                        | 17               |
| 8                | Poor change controls                                              | 3                |
| 9                | Lack of required technical know-how by offshore team              | 5                |
| 10               | Failure to consider all costs                                     | 13               |
| 11               | Telecommunications and infrastructure issues                      | *                |
| 12               | Vendor viability                                                  | 11               |
| 13               | Difficulties in ongoing support and maintenance                   | 14               |
| 14               | Low visibility of project process                                 | *                |
| 15               | Cross-national cultural differences                               | *                |
| 16               | High turnover of vendor employees                                 | 12               |
| 17               | Constraints due to time-zone differences                          | *                |
| 18               | Lack of continuous, face-to-face interactions across team members | *                |
| 19               | Threats to the security of information resources                  | *                |
| 20               | Negative impact on employee morale                                | 20               |
| 21               | Unfamiliarity with international and foreign contract law         | *                |
| 22               | Differences in development methodology/processes                  | 15               |
| 23               | Political instability in offshore destinations                    | *                |
| 24               | Negative impact on image of client organization                   | *                |
| 25               | Currency fluctuations                                             | *                |

\* Denotes a risk factor that appears in the offshore panel rankings only.

issues that are unique to outsourcing, especially vendor management ability. For example, one panelist observed the difficulties of duplicate management structures (both a client and vendor management team): “the two groups involved had their own, different management vision and scope... the two groups competed for political gains and did not cooperate.” The issue of managing the vendor relationship has received a considerable amount of attention in the outsourcing literature. For example, Grover et al. [11] looked at the effect of service quality of the vendor, as well as the ability of the client companies to build partnerships. Lee and Kim [21] found a positive relationship between partnership quality and outsourcing success in a survey of 36 firms. Moreover, several aspects of partnership management capability have been empirically identified in the literature, including contractual factors [18], vendor–client alignment, trust-building [19] and knowledge sharing [20].

Two issues related to vendor capabilities, *lack of required technical know-how* and *inadequate staffing by vendor*, were identified as very important by both groups. Sometimes the vendor has the wrong resources assigned to a project: “Sometimes a company assigns a person to a project because there is no one else though the person has no real experience.” Panelists in the domestic group also brought up a similar issue: *lack of vendor commitment* where the vendor is “overcommitted to another account and gets behind or is confused with the project deliverable.” Not surprisingly, the importance of technical vendor capabilities has been recognized in the literature. For example, Koh et al. [17] interviewed client project managers to find projects where meeting obligations was particularly challenging; they found that clients perceived the most important vendor obligations to be accurate project scoping, clear authority structures, taking charge, effective capital management, effective knowledge transfer, and effective inter-organizational teams. Oh et al. [23] empirically showed that effective vendor capabilities can reduce transactional risk and therefore improve project outcomes. Han et al. [12] addressed the impact of firm capabilities on outsourcing success looking at it from a process perspective.

#### 4.2. Exacerbated risk factors

A number of risk factors were pronounced in the offshore context. Such factors included communication issues, poor change controls (scope creep), lack of business know-how, and failure to consider all costs.

As expected, both domestic and offshore groups felt that problematic communication was a very important risk. However, the offshore context was especially risky due to the effect of language and cultural differences between the onshore client and offshore vendor: “Even when both parties speak English, there is a major chance for misunderstanding because our language is based on cultural assumptions.” Another panelist noted: “Misunderstandings abound because of colloquial speech and writing.” One panelist wrote: “The project client countries’ business laws, methods, and manners are often different: ‘Common’ reference points are not always available.” and another said “Written business requirements must be understandable across cultural barriers and are must be very granular and explicit; this causes delays.”

*Poor change controls* figures prominently in both contexts. However, there are issues that need special attention in the offshore context. For example, one panelist thought that “the high quality of code and CMMi Level 5 processes that exist for most organizations overseas further increases the likelihood of being delivered exactly what you’ve asked for—so you better make sure you are asking for exactly the right thing.” Further, as noted above, “common reference points” are not always available, so that business requirements must often be made more explicit, and changes to initial requirements must also be made more explicit, and more carefully managed.

As noted above, we found that both groups felt that lack of technical know-how was important in both contexts. What stood out in the offshore context, however, was *lack of business know-how* (#17 in the domestic context, #7 in the offshore context). We believe this is due to the fact that technical skills, such as programming and systems analysis and design, are more easily teachable and transportable across countries. What is more

difficult to convey to overseas vendors are the business practices and know-how of a company. For example, one offshore panelist noted: “If a great deal of knowledge of the industry is required to develop and test the software an outside vendor has a greater chance of missing things when in development.” Similarly, another participant commented: “Overseas staffing lacks training of entire business picture.” In general, there were more business-related comments among the offshore panelists than there were among the domestic panelists.

Finally, *failure to consider all costs* was likely to be more problematic in the offshore context. One panelist said that “offshore resources had to come to the US to be trained for several weeks. The cost of airfare, lodging, and food, as well as the time lost getting the individual to local sites, were higher than expected and continued longer than expected.”

#### 4.3. Factors unique to the offshore context

Our offshore panelists identified seven risk factors special to offshore outsourcing:

- Language barriers in project communications (#3).
- Cross-national cultural difference (#15).
- Constraints due to time-zone difference (#17).
- Unfamiliarity with international and foreign contract law (#21).
- Political instability in offshore destinations (#23).
- Negative impact on image of client organization (#24).
- Currency fluctuation (#25).

With the exception of language barriers in project communications, none of these risk ranked very highly in importance.

Several panelists commented on various cross-national cultural and country risks. One comment by an expert illustrates these concerns: “Doing business with a different country usually involves risks of a dispute due to different (or incompatible) laws, currency, business and accounting practices, failure of communication lines and travel, political risk, etc.”

A number of panelists commented on the problems due to time-zone differences. One panelist said “offshore projects can require people to be working out of cycle both in the US and offshore. This is important when testing must be done in the US environment by remote developers outside standard working hours.” Another noted the difficulty “to get key team members together due to a 12-h time-zone difference.”

*Telecommunications and infrastructure issues* arose because of a lack of reliable networks in some countries. For example, one panelist recounted an incident: “When we were ready for user testing, only 1 week was allotted; the code was too large to send over the network and there were delays in shipping.”

## 5. Conclusions

### 5.1. Limitations

First, though we identified the most important risk factors, we discovered no ways to manage and mitigate them. A second limitation is that the profiles were primarily project management-oriented. We believe that this result occurred for two reasons. First, the panelists were IT managers who were selected primarily for

their project management experience. Thus it is not surprising that they focused on these concerns. Second, the study was based on the project management literature, which we used as a starting point in the generation of risk profiles. As a result, we did not address the long-term implications of outsourcing. A third limitation was that our research lacked a theoretical framework. Our study was exploratory in nature, and attempted to cast as wide a net as possible in identifying risk factors. A fourth limitation was that the comparisons between the two contexts was qualitative in nature.

### 5.2. Contributions

While most of the literature on IT outsourcing deals with the make-or-buy decision [22], there has been much less work on understanding the important question of what could go wrong. We were troubled by this state of affairs, given that so many outsourced initiatives end up delivering far less than expected. Our study contributed in several ways.

First, we have two empirically validated lists on the relative importance of risk factors in the domestic and offshore contexts. We believe that we have generated a more comprehensive list of risk factors of outsourcing than was produced in the past. Further, we believe that we managed to generate generalizable results by allowing panelists with diverse experiences and industry affiliations to participate in our study. Second, we believe that our study resulted in a valid comparison of offshore and domestic outsourcing risks. While many of the same issues surface in both contexts, it is clear that there are issues that deserve special attention in the offshore context. A secondary finding was that the more generic project management risk factors were at the top of both lists, indicating that general project management skills are important to managing outsourced projects. Third, the use of the Delphi method provided good commentary and discussion. Even though many of the same issues emerge, it was clear that the panelists of the domestic and offshore groups often focused on different aspects when discussing the same risk factor. In particular, we noted that where the offshore and domestic panels diverged most, the important risk factors were even more problematic in the offshore context. In sum, we believe that our research has several practical implications for IT managers. Software development outsourcing is full of risk, and managers need to be aware of what the important factors are and how to manage them. With offshoring, this becomes even more critical given the geographic and cultural barriers. Indeed, increasingly the IT manager will need to know how to manage the virtual, globally distributed corporation, a place where a manager will be forced to manage employees he or she cannot see, except in a teleconference. Such a manager will need a great deal of help and training to manage such projects.

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## Appendix A. Round 1 survey for offshore panelists

### A.1. Project risks study

#### A.1.1. Offshore outsourcing project questionnaire

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### **Instructions**

The purpose of this questionnaire is to solicit your input on the key risk factors of offshore software development projects. An offshore project refers to an outsourced project in which the development work is primarily completed abroad. Such projects may involve custom-made software development or major customizations of a software package. A project risk factor refers to a condition that can present a serious threat to the successful completion a software development project.

A recent study has identified the following as critical risk factors (note that this study focused on all types of projects, not just offshore outsourcing ones):

|                                           |                                        |
|-------------------------------------------|----------------------------------------|
| • Changing scope/objectives               | • Lack of adequate user involvement    |
| • Conflict between user departments       | • Lack of frozen requirements          |
| • Failure to gain user commitment         | • Lack of required knowledge skills    |
| • Failure to manage end user expectations | • Lack of top management commitment    |
| • Insufficient/inappropriate staffing     | • Misunderstanding of the requirements |
| • Introduction of new technology          |                                        |

We would like you to answer the following question:

**What are the most important risk factors that a project manager must pay attention to while managing an offshore-outsourced software development project?**

To answer this question, please list at least six risk factors in the space provided on the next two pages. In selecting your risk factors, you may use any of the factors specified above, or you may generate your own. For each risk factor, kindly provide a one-line description and give a brief explanation for it.

While preparing your response, please assume that the project is a major undertaking and will require a substantial investment (in terms of human and financial resources) for its completion. Also, assume that the project manager is employed by the client organization, not the outsourcing vendor. We encourage you to reflect on past experiences to generate your responses. If you need to make additional assumptions about the situation, please describe them on the last page of the questionnaire.

**THANK YOU FOR YOUR INPUT AND COOPERATION**

## A.2. Project risks study

## A.2.1. Offshore outsourcing project questionnaire

---

Participant ID: XXX

**What are the most important risk factors that a project manager must pay attention to while managing an offshore-outsourced software development project?**

|                                                    |
|----------------------------------------------------|
| Risk factor 1:<br><br>Rationale for risk factor 1: |
| Risk factor 2:<br><br>Rationale for risk factor 2: |
| Risk factor 3:<br><br>Rationale for risk factor 3: |
| Risk factor 4:<br><br>Rationale for risk factor 4: |

Risk factor 5:

Rationale for risk factor 5:

Risk factor 6:

Rationale for risk factor 6:

Please feel free to use extra pages if you wish to provide additional risk factors or describe any assumptions you made in responding to the question.

**Thank you for completing the questionnaire**

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