Small Firms and Offshore Software Outsourcing:
High Transaction Costs and Their Mitigation

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ABSTRACT

It seems surprising that small firms engage in offshore outsourcing given that they lack the resources that large firms possess to overcome the difficulties involved. We examine these factors using transaction cost theory's three stages: contact costs, contract costs, and control costs. Then, using our field data from small client firms (in the United States and the United Kingdom), intermediaries, and offshore vendors, we analyze the mitigation approaches that reduce transaction costs for small firms. We identify nine such approaches: three for client firms and six for suppliers. For the small client firm, they are liaisons of knowledge flows, gaining experience, and overcoming opportunism; and, for the service providers, they are onshore presence, reducing contact costs, simplifying contracting, providing control channels, expert intermediaries, and standardization of services.

Keywords: please provide

INTRODUCTION

Over the last decade, many firms in the U.S. and Western Europe have outsourced software development tasks to offshore sites in countries such as India, Russia, and the Philippines. More than 50% of the American Fortune 500 firms and an increasing proportion of Western European and Japanese firms are users of offshore software sourcing (Carmel & Agarwal, 2002; Sahay, Nicholson, & Krishna, 2003). Research on onshore or domestic information-systems outsourcing has significantly enhanced our understanding of why such firms outsource software development (Lacity & Hirschheim, 1993) and how relationships may be effectively managed with appropriate risk mitigation, coordination, and control strategies (for example, Kern & Willcocks, 2000; Lacity & Willcocks, 2001; Levina & Ross, 2003; Sabherwal, 1999, 2003). Other scholars and practitioners have drawn attention to the particular difficulties presented by offshore software outsourcing (Apte, 1990; Kumar & Willcocks, 1999; Nicholson & Sahay, 2001). Communication may be impacted by tech-

nical issues such as telecommunications infrastructure, cultural differences, accents, and language ability (Walsham, 2001). Time-zone differences may lead to coordination difficulties (Carmel, 1999). Often the offshore team lacks domain knowledge in the business application in question, and transferring this knowledge is hampered by distance (Sahay et al.).

This prior research in onshore and offshore software sourcing has improved our understanding of the management of software outsourcing and the additional complexities presented in offshore relationships. However, most of this research has centered on large organizations that have the internal resources to address the problems of managing across time and space. Therefore, in this article our approach is to focus on the issues faced by small companies when sourcing[1] software offshore.

We have noticed in the course of our related research, fieldwork, conference attendance, and consultancy that an increasing amount of offshore sourcing of software development work is taking place between small client firms and offshore vendors in India and other countries. This trend looks set to continue. Small and large firms have chosen to outsource for a number of reasons such as skills shortages, cost, capacity, flexibility, and a "bandwagon effect" (Heeks, 1995; Lacity & Hirschheim, 1993). We have encountered cases of small U.S. and U.K. technology firms engaging in offshore software development since the late 1990s. At that time, the growth of the Indian IT industry was closely linked to the demand for skills from Europe and the U.S. for Y2K (year 2000) alleviation and subsequently the demand for development skills in dot-com companies. During the late 1990s, small U.K. and American technology firms faced a recruitment crisis due to the high cost of IT skills and the inability to provide the perks and career paths that large companies could offer. Access to scarce skills was shown to be a major driver in the cases of Sierra (Nicholson & Sahay, in press; Nicholson, Sahay, & Krishna, 2000; Sahay et al., 2003) and Harlequin Solutions (Ballard, 2003), which are both small technology firms that sourced software development in India during the late 1990s. After the dot-com bust and U.S. economic downturn post-2001, the Indian IT industry has continued to grow despite recession in the U.K. and the U.S. ("Nasscom Indian IT Industry: A Success Story," 2004). This is largely because the highly competitive American and British IT services market compelled technology firms into sourcing software offshore in order to cut production costs.

Our sample of small firms is comprised of American and British firms, so we note these two nations' propensity to source offshore. First, small American and British firms are more likely to source offshore than small firms from other nations (Aepple, 2004; Sonwalkar, 2004). The second point is inferential; since, as is repeatedly stated in the media, a greater proportion of U.S. firms have been outsourcing than firms in Europe, it is likely that a greater proportion of small American firms have been outsourcing than in the U.K. Nevertheless, the forecasts for the U.K. suggest growth. According to Datamonitor, IT spending by U.K. smaller firms is estimated to rise from $76 billion in 2002 to $109 billion by 2006 (Mortleman, 2003). Inevitably, as outsourcing increases from small companies and becomes common practice, offshore firms will be striving to compete.

Defining "small firm"[2] is controversial (D'Amboise & Muldowney, 1988; Nooteboom, 1993) as there is no single definition mainly because of the wide diversity of sectors and business types, and

different treatments in different nations. We use as our guideline the definition from Section 248 of the U.K. Companies Act (1985)[3] that a small firm employs 50 or less employees. Even though the vast majority of firms of all sizes are small firms, little is known about the magnitude of offshore software outsourcing by small firms[4], although Ansberry (2003) found that 60% of companies with fewer than 500 employees were planning expenditures of more than $1 million in the following 12 months on all types of outsourcing including IT, manufacturing, and logistics — both domestic and offshore.

In this article, we posit that small firms face relatively high transaction (coordination) costs when undertaking offshore software sourcing. This is because small firms are disadvantaged relative to large firms in a wide range of resources crucial to coordination (DeLone, 1981; Pollard & Hayne, 1998). Resources for travel, research, and control are tight. Small firms must deal with the relative shortage of management staff and with personnel-recruitment disadvantages. In small firms, the entrepreneur is often involved in operational and managerial tasks and therefore his or her time is scarce. Usually small firms have no specialized staff for finance, legal affairs, or information technology, and thus are less likely to have the resources in-house for strategic software development projects. Communications improvements commonly used in large firms such as videoconferencing or other collaborative technologies may be financially prohibitive for the small firm. When outsourcing, small firms have higher search costs due to limited staff support, and they incur relatively high set-up costs relative to the transaction size. Furthermore, small firms tend to have fewer documented sources of information, and this results in them being more inscrutable to transaction partners (Nooteboom, 1993).

As we noted above, the majority of research on software outsourcing, whether on- or offshore, does not make distinctions between constructs as they apply to small or large firms. However, the case of Sierra (Nicholson & Sahay, in press; Nicholson et al., 2000; Sahay et al., 2003) describes the difficulties facing such ventures. This case involved a small software firm that attempted to set up and sustain an offshore software development subsidiary in India. The failure resulted from a lack of resources typical to small firms: capital to sustain the growing offshore center, capital for the travel costs of expatriates with India-specific context knowledge, and resources (such as reputation and dedicated staff) to attract and retain the best offshore staff.

Therefore, sourcing software development offshore is an enormously difficult undertaking for a small firm. We set out to examine whether small firms can mitigate offshore transaction costs at least as well as large firms. Transaction cost economics (TCE; Williamson, 1975) and Nooteboom's (1993) differentiation of relative transaction costs incurred by small and large firms respectively provide the theoretical framework through which we analyze the following questions.

- What are the transaction costs facing small firms engaging in offshore software outsourcing relative to large firms?
- What transaction cost mitigating strategies are small companies adopting to manage the process of offshore software development?

The article is organized as follows. In the next section we present a summary of the theoretical frame and present the

argument that small and large firms incur different levels of transaction costs when sourcing offshore. Then, we present the research methodology and sample description. Next, we present our empirical findings of small-firm mitigation strategies for relatively high transaction costs. We also discuss the special case of small technology firms. Finally, we present our conclusions, contribution, and implications.

THEORETICAL FRAME

Literature from strategic management (Chen & Hambrick, 1995; D'Amboise & Muldowney, 1988; Dean, Brown, & Bamford, 1998) has demonstrated that small and large firms require different theories and models to explain their behavior, strategy, and performance.

One distinction is that small firms cannot rely on economies of scale to gain advantage (Fiegenbaum & Karnani, 1991). They are restrained by limited resources in terms of staffing with reliance on fewer generalists and less structural formalism (Borch & Arthur, 1995). Smaller firms face relative limitations in raising financial resources in contrast to the "deep pockets" of large firms that enable them to weather financial losses or other difficulties and to be less negatively impacted by sunk costs (Dean et al., 1998). This prior research has advanced our understanding of small firms and has established the need for continued, serious theoretical and empirical consideration of the particularities of firm size.

Offshore software outsourcing presents communication and coordination difficulties that are highly challenging for small firms. To analyse the importance of firm size and offshore software outsourcing requires a framework that allows the analysis of such coordination costs and emphasizes the particularities of small firms. For this we draw on the work of Nooteboom (1993) and Nooteboom, Zwart, and Bijmolt (1992), who have utilized and extended transaction cost economics (Williamson, 1975, 1985) to take account of small- and large-firm differences. In the sections to follow, we summarize relevant TCE concepts and then proceed to discuss the relative differences in transaction costs between small and large firms when outsourcing offshore.

TCE explains where the firm boundary will be positioned based on the costs of various production and coordination mechanisms. We draw on TCE for two reasons. First, the theory has been used often as a basis for examining outsourcing (Ang & Straub, 1998; Aubert, Rivard, & Patry, 1996; Lacity & Hirschheim, 1993; Lacity & Willcocks, 1996; Wang 2002). Second, TCE is a framework through which many differences between small and large firms may be understood. TCE proposes that costs are comprised of production and transaction costs. Transaction costs, or coordination costs, are the costs of managing (controlling and coordinating). Units within the firm can be combined or split up depending on their production and transaction costs. Some units will split off or be outsourced if the costs of the internal units are higher than the market costs. In contrast, large governance units may be more efficient if units can be combined to reduce transaction costs. Firms acting rationally will adopt market-based strategies when their production cost savings of outsourced offshore work outweigh the additional transaction costs incurred. This may be depicted numerically:

$$\text{production cost savings} > \Sigma(\text{transaction costs})$$

Much of the production cost savings in offshore outsourcing stem from the wages of the software staff in low-wage

nations such as India. Indian wages, not including overhead, are 10% to 30% of comparably skilled staff in the U.S. or the U.K. However, transaction costs incurred are the coordination costs due to such issues as the cost of monitoring the offshore vendor across time and space. These transaction costs, if calculated, may exceed the production cost savings due to lower wages. In such a case, the firm would more profitably organize production inside the organizational hierarchy, that is, in house. This "make or buy" decision is also related to the frequency of transactions, whether occasional or recurrent, and the degree of asset specificity or customization necessary for the transaction. Also of relevance is the threat of vendor opportunism, especially where there are small numbers of vendors. Finally, conditions of uncertainty present potentially high transaction costs as commensurate coordination and information-gathering mechanisms are required to be put in place to manage the uncertainty surrounding the transaction.

In particular, Nooteboom's (1993, p. 284) contribution has enhanced our understanding of how "smaller firms as both suppliers and buyers, incur higher transaction costs directly, and cause higher transaction costs for transaction partners" than large firms. In order to justify this, Nooteboom presents an extension to the TCE framework to include firm size, taking into account economies of scale, scope, experience, and learning. He states that "small firms generally produce small volumes (scale) of few products (scope). Often they have not been in business long and thereby have little benefit from economies of experience. Often they have limited capacity for the acquisition of knowledge [learning]" (p. 283). Nooteboom identifies how a transaction can be examined in three generic stages: contact, contract, and control. All three stages have threshold costs that are relatively higher for small firms. These threshold costs are the set-up costs: the costs of setting up a contract, judging an offer, and setting up channels of communication and governance mechanisms. These costs arise regardless of the transaction size and thus weigh heavily for smaller transactions.

In the following three subsections, we explain and expand on Nooteboom's (1993) work and examine the relative transaction costs incurred by small firms relative to large firms. These issues are presented in relation to the three generic stages — contact, contract, and control — focusing on the particularities of offshore outsourcing.

Contact

At the stage of contact, buyers incur search costs and the seller incurs costs of marketing. Small firms may be attracted by economies of scale and scope offered by offshore vendors. Economies of scale suggest that the small firm would benefit more than the large firm from outsourcing since small firms tend to have difficulties attracting and retaining the best personnel, generally cannot afford to maintain technical specialists in house in narrow areas, and cannot "ramp up" for one-time large projects. The process of vendor search and assessment is an example of a critical task where small firms are hindered by economies of learning. Nooteboom (1993) points to an increase in the ability to perceive, interpret, and evaluate when firms are larger due to, for example, the numbers of specialist staff, spread of personal networks, and propensity of access to technologies. In contrast, a small firm has fewer individuals in specialized information roles who tend to have relatively lower levels of education. For Nooteboom (p. 289), "the smaller firm rationality is more bounded

along three dimensions: width (fewer functional areas in staff support), depth (lower level of education with the exception of firms in science based sectors), and variety (dominance of the personal perspective of the entrepreneur)."

The implications of these deficiencies are marked when engaging in sourcing software offshore. Small firms are unlikely to have competent internal expertise to conduct the search, evaluation, and implementation of offshore software sourcing. Contact costs for suppliers tend to be higher when marketing to small firms than to large firms because suppliers have more trouble in generating awareness. The small firm has a relatively limited number of individual staff members, many of whom act in generalist roles. For offshore software sourcing, these individuals must learn many new topics, such as the legal and cultural norms of the vendor's country. Small firms may mitigate this by hiring a variety of specialists such as outsourcing consultants and lawyers, for example. However, these specialists themselves bring about high threshold costs for small firms relative to large firms.

Contract

Nooteboom (1993, p. 285) identifies costs at the stage of contract as:

incurred in the preparation of an agreement to transact in which one tries to anticipate possible problems during execution. Costs include search of information on reliability of the transaction, possible contingencies in the future and degree to which investments will be sunk. They further include costs of negotiation, legal advice, set up of arbitration, design of safeguards and guarantees against misuse.

Small firms suffer higher relative contracting costs because of the relatively small transaction size. This includes the costs of negotiation, legal advice, set-up of any third-party procedures, and designing safeguards. Contracting across international legal regimes presents high threshold costs for small firms. Enforcing contractual clauses and penalties such as procedures for data transfer upon contract termination is more difficult and costly across different regulatory and judicial environments. Pursuing an offshore software vendor in Indian, Chinese, or Russian courts is not a task a small firm should undertake lightly. Contract law is different in each nation, so different enforcement and dispute-resolution approaches need to be considered and included in the contract. These are all daunting tasks for the small firm often without individuals experienced in global business. If the small firm chooses to open a subsidiary abroad (i.e., within the hierarchy), then the contracting and legal arrangements are significantly more complex and time consuming. This may be contrasted with the "red carpet" treatment that large firms often receive when outsourcing or opening subsidiaries offshore. Large firms are welcomed by a menu of incentives and matching investments. For example, Microsoft executives were received by national political and business elites when they visited India in recent years, particularly in Andhra Pradesh where promises of changes to educational curricula in colleges were made to facilitate the supply of skilled labor. Intel executives were solicited by the president of Costa Rica himself, who was closely involved in negotiations.

Control

Nooteboom (1993, p. 285) identifies the stage of control as comprising of "costs of monitoring, settling disputes ('haggling'), renegotiation, arbitration, litigation, loss of investments due to the relationship break-

ing up." When a firm sources software development offshore, it needs to have control beyond the boundaries of the firm and beyond the political, economic, social, and technological boundaries of the country. In order to control the software development process across this diverse environment, control measures need to be put in place. Appropriate measures include process measures (percent complete and number of bugs) as well as outcome measures (meeting functionality and performance). Small client firms often do not have the knowledge of how to put in place measurement systems such as these for global operations. Measurement systems are another form of threshold cost that impact small firms relatively more than large firms. Small companies are less likely to be accustomed to long-distance control. For instance, recent research on the use of information systems in small and large companies found that small firms tend to use computers more as tools and less as a communications medium (Pollard & Hayne, 1998). Prior research has shown how using computers as a communications medium is important in facilitating communication and monitoring distant suppliers of IT services (Sahay et al., 2003).

Offshore outsourcing is fraught with implementation failures. Prior outsourcing research has shown that it is common to find that firms fail on their first or second episode, and then give up on outsourcing or achieve success in subsequent attempts (Lacity & Wilcocks, 2001). Thus, success stems from experience, or in the language of transaction costs, economies of experience. However, Nooteboom (1993) points out that small firms are hindered by their size in achieving economies of experience. Economies of experience are the decline of average costs caused by the "increase of cumulate production over time, accumulation of knowledge and the ability to reduce errors and redundancies that occurred the first time that one performs a task." This experience effect, in essence, is the result of doing more of the same. Smaller firms lack the financial resources to absorb failures and learn from experience. According to Nooteboom (p. 290), knowledge in small firms tends to be "more craft-like and based more on experience (learning by doing) as opposed to procedural, formal explicit rules and procedures associated with the need to communicate more widely and therefore more formally." In essence, small firms cannot absorb the failures associated with learning from offshore outsourcing. Furthermore, they lack formalisms, stores of processes, practice guidelines, rules, or methodologies. This feature has the effect of making the small firm less able to adapt its processes over time as learning takes place. It also makes the firm more inscrutable to offshore vendors. Records or formalized documentation on coding and quality standards, for instance, may be lacking. This may be justified in a small firm because of the expense, or formal standards may be perceived as bureaucratic and unnecessary due to the reliance on informal oral communication. However, lack of client-side formalism will mean higher threshold costs at the start of outsourcing. Also, it may affect learning from experience and continuity, a problem that may become acute in small firms if key persons should leave.

Opportunism is concerned with the circumstances when one party to a transaction takes advantage of the other. The distance between the client and outsourcer accentuates the possibility for undisclosed, "behind the scenes" improvizations and unseen third-party subcontracting. We illustrate a case of opportunism that we learned of in the course of our study. While

the end client was not a small firm, this incident illuminates opportunism in offshore outsourcing.

N is a well-known U.S. firm that contracted to an Irish vendor. The Irish firm contracted for the work to be done by a British firm. The British firm then contracted the work to be done by a Belarus firm. The Belarussian firm performed all the coding! The Irish firm (unashamedly) did not disclose to the American firm that it had passed on the software coding work to these other firms.

Small firms, by contrast, are more likely to purchase from a small number of other small firms due to the lower prices typically charged by smaller firms. However, such small suppliers are more likely to be opportunistic or "fly by night" and disappear more easily than large firms. There is also evidence that the largest suppliers in India selectively choose not to do business with small clients. Larger firms are relatively less sensitive to a single act of opportunism because the risk tends to be spread across many transaction partners. Doing business with large companies enhances the reputation of suppliers, and they may act as reference sites for other potential customers. We have heard many anecdotes of Indian outsourcing companies opportunistically moving their best staff unseen to new prestigious clients with high-value contracts. The relative size and prestige of large firms reduces the risk of opportunism, especially if there is a large contract and the possibility of high-value contracts in the future. By contrast, smaller firms tend not to have the "brand presence" of large firms or the contract size to guard against supplier opportunism.

Controlling the high levels of uncertainty in this environment forces small firms to incur high information costs. This can be examined at three levels. At the macro level, small and large firms face uncertain political and economic instabilities. For instance, India has been close to war with Pakistan on several occasions, most recently in 2002. Fiscal incentives to offshore to the Philippines may be eliminated because the national government has been under pressure to eliminate the generous tax incentives on offshore sourcing, which could push up prices. At the micro level, there is uncertainty over intellectual property in less developed countries; China, for example, has weak enforcement. At the operational level, there is uncertainty over such issues as vendor nonperformance, ineffective communication due to unreliable telecommunications, corruption, and access to recruitment networks. Large and small firms are, of course, affected by these uncertainties. However, large firms have the resources to overcome some of them more effectively than small firms can. Sahay et al. (2003) discuss how Globtel, a major North American telecommunications company, had the resources to standardize Indian operations by moving large numbers of expatriates, methods, standards, and training programs into their Indian offshore outsourcing partners. This had the effect of creating a piece of the U.S. in India in terms of the reduction of cross-cultural and communication problems, provision of a reliable infrastructure, standardized project management processes, accounting conventions, and due diligence procedures. In the 1980s and 1990s when offshore outsourcing began in India, large companies like Texas Instruments and Motorola had the technical and financial resources to install their own satellite links to overcome local telecommunications weaknesses, while smaller firms had to rely on unreliable, low-bandwidth public telecommunications or on transport-

ing computer tapes on a daily or weekly basis by air freight (Carmel, 1999).

In summary, our theoretical frame is derived from TCE and in particular the work of Nooteboom (1993). A consideration of the relative differential in transaction costs between small and large firms at the three stages of contact, contract, and control will enable a discussion of the transaction cost mitigating strategies adopted by the firms in the sample.

METHODOLOGY

In order to study this topic and address our research questions, we sought out to understand offshore outsourcing practices by small firms. Therefore, we collected data from the small (client) firms, from the vendors that serve them, and from the emerging layer of intermediaries and specialized service providers. This approach is consistent with recent work on IT sourcing by Hui and Beath (2002). During the period of 2000 to 2003, the authors collected data from 9 small client firms, 5 consultancies[5], and 11 vendors. The principal thrust of our data collection was from the small client firms themselves, and we begin with a description of our approach for this segment.

Table 1 summarizes our sample of small firms. The client firms ranged from having 3 to 180 employees. (The firm with 180 employees was allowed into the sample because the client was a small unit of less than 25 employees that was largely independent from the larger company.) Most of the clients sourced from India, but other destinations included Russia and Pakistan. Because of the authors' location, the sample client firms are all in the U.S. and U.K. Our sample was opportunistic: firms were identified from the authors' professional contacts and from articles in practitioner journals. We had no restrictions on the location of the offshore unit.

We conducted in-depth semi-structured interviews with key personnel. In all, there were 18 interviews. Interviews took place with the owner-entrepreneur in most cases, and in some (C1, C3, C8) we asked and were allowed to interview other staff such as project managers and analyst-developers. In one case (C8), interviews took place with the offshore unit in Iran as well as with the client side in the U.K. Respondents were asked to reconstruct events from the inception of the offshore outsourcing project relationship as well as provide us with their perspectives on the relations and tensions within the projects

Table 1. Small-firm-sample key characteristics

Client firm	Location of client	Client firm no. of employees	Offshore location	Activity sourced offshore
C1	UK	25	India	Coding in Lotus Domino
C2	U.S.	25	India	Collaboration product
C3	UK	180	India	Web site in JAVA
C4	U.S.	20	India	E-Commerce platform
C5	UK	29	Oman (to Indian firm)	Web site with online shop
C6	U.S.	3	Russia	Module for a streaming product
C7	U.S.	12	Russia	Insurance system
C8	UK	25	Iran	Utilities billing
C9	U.S.	50	Pakistan	Health care
Median		25		

over time. To ensure reliability, we used a standard format for data collection. Some firms provided us with additional data such as corporate information, reports, and specifications. We also attempted to obtain data from the trade press and from Web sites in a process of the triangulation of data sources. Interviews were taped if the interviewees agreed and were then transcribed verbatim. We offered anonymity to induce interviewees to share more sensitive aspects.

The cases we examined had varying relationship arrangements; some projects were short-term while others involved longer-term arrangements. Some clients worked directly with the offshore unit while others worked indirectly through onshore personnel or an onshore software house with offshore arrangements. The nature of the work included both custom and software package development. The unit of analysis was at the level of the project sourced to the offshore unit, but we also gathered background data on other projects.

We triangulated our data collection further by conducting interviews with vendors and intermediaries that are active in serving small client firms in the offshore context. Our approach here was to validate and complement our data from small client firms described above. We sought out vendors and consultants for interviews in which we focused on our two research questions regarding transaction costs for small client firms. For both communities, we probed for problems and solutions of selling IT services in the offshore context. We interviewed vendors in a number of regions including India, Central America, and Eastern Europe, as well as the vendor representatives in the U.S. and U.K. We also sought out intermediaries (these reside in the client nations, e.g., the U.S. and U.K.).

We analyzed all our data first by performing an interview summary and a preliminary theoretical analysis of the interviews from each case. We then grouped together the themes and responses into categories organized around the dimensions of the theoretical framework by applying a data display method (Miles & Huberman, 1994). The resulting tables allowed us to compare and contrast the strategies and multiple perspectives in the case companies in subjective cross-case analysis. It also enabled patterns to be identified in the process of moving back and forward between the data and theory in a "hermeneutic circle" (Klein & Myers, 1999), enabling us to make sense of the large amount of qualitative data. This process was accompanied by reading and rereading the transcripts and summaries in relation to the theory, and discussion between the authors and with other colleagues and students in our respective institutions. With regard to the generalization potential of the findings, the aim of the qualitative analysis of the cases is concerned with making an analytical generalization (Walsham, 1995) offering deep insight into the transaction costs mitigating strategies employed by the vendor and client to enable offshore outsourcing.

DATA AND DISCUSSION

In the previous section, we introduced and explored the relatively high transaction costs for small firms engaging in offshore sourcing relative to large firms. We turn now to a discussion of what small firms can and are doing to mitigate these costs. We illustrate our analysis with our field data. We present our observations in three parts. First, we examine what the small (client) firms can do to mitigate offshore costs. Then, we examine how the offshore

marketplace (primarily the vendor firms) is evolving to mitigate offshore costs for their small client firms. Finally, we present our findings about the special case of small technology firms, which we find to have different characteristics than small non-technology firms vis-à-vis offshore sourcing.

Client-Side Mitigation Approaches

Liaisons of Knowledge Flows

Our findings suggest that it is the presence of one or two key individuals, or liaisons, that pivots the relationship between the client firm and offshore vendor and is critical to its success or failure. The role of these liaisons is critical since the IT teams in the small firms we interviewed had limited resources and thus placed greater responsibility on one or two individuals. This is consistent with recent research on the role of individuals and relationships within internationalizing service firms. Lindsay, Chadee, Mattsson, Johnston, and Millet (2003, p. 8) write that "services firms have not only a higher dependence on knowledge flows, but also on individuals within the firm that are relationship builders and creators and transmitters of knowledge." The cases demonstrated several instances of how these liaisons mitigated transaction costs. First we illustrate the importance of network ties and then the importance of individual skills and qualities. Then we demonstrate the importance of stakeholders as liaisons of knowledge flows.

Transaction cost theory is often criticized for ignoring the importance of embedded network ties (Granovetter, 1995) that may significantly reduce transaction costs. Firm C8 sourced software from Iran, which, due to many factors including a U.S. embargo, political instabilities, and corruption, seems an impossible place to source software. The high transaction costs of sourcing from Iran were mitigated because the vendor software company was owned by a close family with resultant high levels of trust and a reduced need for extensive control mechanisms. Other cases illustrate this importance of trust in the relationship and network ties to mitigate high transaction costs. Firm C4 is an American firm developing e-commerce software. C4's U.S.-based chief technology officer (CTO) is an Indian expatriate. The CTO set up a small development unit in his home city in India staffed with some of the CTO's former schoolmates. He had nightly telephone calls with them, and the personal relationship reduced transaction costs considerably. The contact costs were reduced, and the contract costs were reduced because of the trust between the Indian expatriate and the offshore supplier. Finally, the control costs were lowered due to the reliance on the trust between friends.

We found that in many of the small firms in the sample, the skills, personal qualities, and even appearance of the liaison were seen to be crucial. In firm C3, the liaison between Britain and India was resident in Manchester, U.K., and Caucasian in appearance. He had his upbringing in Burma (Myanmar) married an Indian woman with family residing in India. He had many years of experience in management consultancy in the U.K. and in offshore outsourcing management consultancy, and subsequently started his own business. He told us that he felt that his appearance, manner, family, and business ties in India and Britain coupled with his experience of living and working in both countries (and others) enabled him to sensitively "straddle" both the Indian and British cultures in terms of his understanding of the norms and constraints of doing business and the social structural environments

in India and Britain. Thus, the resulting relationship had relatively low information and search costs, as well as a reduced requirement for consulting with intermediaries.

Another example of network ties mitigating transaction costs was found in Firm C5, a U.K.-based multimedia company contracted to a Dubai-based offshore outsourcing firm. The managing director of C5 was introduced by a venture capitalist to a Dubai-based software firm for which he was a director. Due to his stake in both sides of the business, the venture capitalist had strong influence over the service C5 received and became involved at several points to overcome problems.

With strong liaisons of knowledge flows, many of the disadvantages of small firms (relative to large ones) are mitigated through friendship and kinship, straddlers, and stakeholders. The case studies indicate that, in different ways, these liaisons can also mitigate opportunism on the part of the vendor, reduce or eliminate contact costs, and lower contract costs because of trust, which reduces the need for control (Sabherwal, 1999).

Firm C1, however, was a contrary case. The firm had no individual to play the key role of liaison. Instead, the firm experienced several failures and then instituted strict control, incurring high transaction costs. Over time, a liaison emerged, client staff identified with the key personality of the vendor's managing director (in Chennai, India), and thus control levels were reduced, leading mainly to larger batches of code sent offshore with less monitoring. However, the client-side developers said they were "stung when a large amount of code was sent by the vendor that was incomprehensible and had to be returned." This event led to a regression of trust in the role of the managing director as liaison, leading to a reinstatement of very small batches and high control.

Gaining Experience

The small firms in our sample were gaining experience in the area of offshore outsourcing through trial and error, compensating for economies of experience present in larger firms but initially absent at the small firm. Put differently, some small firms chose to persevere through several expensive failures in order to see their projects through with offshore vendors. Thus, they were paying a high cost to utilize the low-cost services of offshore vendors.

Firm C1 failed twice in offshore outsourcing endeavors, but the intervention of the entrepreneur maintained the determination to succeed. The U.K.-based client outsourced to a small Indian vendor. Upon embarking on a third project, the project manager on the client side stated that "unless we found out otherwise, we were pessimistic about the competence of [the vendor]." This company was cognizant of the reasons for prior failures and instituted a control strategy that the project managers said "was a pain to make work." The client focused on the detailed control of outputs preceded by clear specifications. The contract included a bug-fixing warranty and payment on delivery. The client sent only clearly specifiable coding work offshore, and projects were broken into very small, manageable modules of around 300 lines of code, which were then subsequently broken into regular-staged releases and iterations. The small chunks facilitated output control and prevented intellectual property theft, which was also a concern. There were weekly checks on the telephone and regular increments for output progress. The client-side development staff in Britain double-checked Indian testing and quality

control. In this case, the small firm was capable of overcoming scale and resources, and engaging in learning from experience without formalization. However, the transaction costs were never measured so it was not known how profitable offshore outsourcing was when taking into account the high cost of control considered necessary.

Evidence from prior studies helps shed light on this dynamic. The literature posits that some small firms have a number of behavioral advantages over large firms that may contribute to overcoming their relatively limited experience (Levy & Powell, 1998; Nooteboom, 1993; Pollard & Hayne, 1998). These studies indicate that small companies often have relatively greater entrepreneurial drive, a propensity to risk taking, perseverance, contain highly motivated people, lack burdensome bureaucratic and political processes, and are fast and flexible. It is these advantages that we observed here.

Overcoming Opportunism

Opportunism takes place when one party of a transaction takes advantage of the other. The distance between the client and vendor accentuates the possibility for undisclosed behind-the-scenes behaviors. Opportunism is particularly costly for the small firm. We describe here the case of a small firm that responded reasonably to the discovery of opportunism, but incurred high control costs in the process.

Firm C2 is a small U.S.-based technology firm that contracted with a large, established Indian vendor that is certified at CMM Level 5. Such certification would mean that the vendor's processes are world-class. Nevertheless, the project ran into difficulties early on when the vendor staffed the project with staff who, in the client's view, were not able to execute the specifications properly. The small company manager told us:

"[i]t turned out, they do keep all those processes carefully, on a hard drive database, where somebody can look at them if they want, but they do not actually follow them. So that was a bit of a surprise to us."

He was also disappointed with the level of the staff that were assigned to the project. The developers assigned to the project were essentially programmers who would write code that met the specification. C2 management had expected staff with project-management experience capable of analysis and design. In addition, as the life cycle progressed, the same manager told us how it was discovered that the Indian team was not doing any unit testing or bug tracking:

"So, it's pretty clear with 30 programmers working on the project, some of them were very good, and others were rookies who didn't have a clue; the rookies didn't have enough supervision. And they turned out some real junk code. And they didn't have any way to track bugs, or discover bugs that were tracked, and no way to know whether they had been resolved or not. They had no way of projecting completion dates because they had no data collection going on. It was junk processes; there was nothing CMM Level 5."

Serious quality issues arose as a result of this, and in response, C2 management escalated control mechanisms significantly. This was in the form of improvised output controls using spreadsheets for bug tracking. The U.S. manager moved to shorter development cycles of 4 weeks. He also began to travel to India regularly, and when he was not in India, he introduced twice-daily telephone calls at the start and end of the Indian working day despite the

time difference. He also complained bitterly to the Indian company. As with the case of Firm C1, these high levels of control were time consuming and costly for the client, although no formal evaluation of this cost was made to justify the "make vs. buy" decision. The project completion stretched to years. C2's management justified their continued involvement for two reasons: the firm did not have internal resources (could not do it in the hierarchy) and, in spite of the difficulties, they felt it was still inexpensive compared with American outsourcing rates.

Marketplace Mitigation Approaches

For the software vendor, selling services to small firms is more expensive than selling to large firms due to scale and setup costs. Nevertheless, we present some evidence from our sample that point to some transaction cost mitigation approaches. The marketplace has adapted to the potential market for offshore work by small firms.

Onshore Presence

Perhaps the most important approach that offshore vendors have adopted and refined is onshore presence. Since undertaking software development tasks tends to be more successful with proximate work of the client and vendor, vendors situate some development and management staff close to the client or even at the client's site. Thus, the offshore vendor maintains an onshore site staffed with various relationship functions such as sales, contracting, systems analysis, and some client support. The local vendor conducts nearly all relationship functions via the onshore staff.

Onshore presence has been common for vendors providing services to large client firms. But this relationship structure is now prevalent for vendors providing services to small firms. For example, there are now 260 Indian IT service firms with at least one office abroad, and many of these vendors are small. Numerous offshore firms from dozens of nations now maintain some representation in the U.S.. The number of Indian IT companies with U.K. offices has grown from 10 in 1994 to 150 in 2003 (Ballard, 2003). For small vendors, the onshore presence is often one individual who wears the "dual hats" of sales person and relationship manager.

Onshore vendor presence addresses many of the offshore sourcing transaction costs. Contact costs are reduced because vendors are close by, contracting costs are reduced because vendors have domicile in the country, and control costs are reduced because of proximity (e.g., legal presence and low telephone costs). Resources are better utilized because the difficult phase of requirements specification, for which the client firm may be ill-equipped, can be done via face-to-face contact.

We emphasize that the converse is to have no onshore presence, which is the case for some smaller offshore vendors. Thus, since they have no proximity between the client and vendor, most communication is conducted via IT. This keeps production costs low because there are no expensive onshore staff. Thus, firms offering services using this approach tend to be able to offer lower prices. To take advantage of this, Firm C5, which began offshore work with the vendor's onshore presence, has slowly shifted a greater proportion of work to the Indian subsidiary center. Its plan was to move toward removing the onshore presence altogether and deal wholly with the offshore operation.

Reducing Contact Costs

In practice, we found that contact costs for small companies are lower than

might be expected. First, information search costs have been reduced by the Internet, particularly by online marketplaces. Online marketplaces expose firms to hundreds of vendors in many countries. Numerous online marketplaces have emerged to provide match-making and thus provide the small client firm with relatively low search costs[6]. Some of these marketplaces also provide basic project advice. Information search costs have been reduced by attendance at specialist offshore outsourcing symposia or conferences. Before 2000 there were few of these events in North America or Europe. At the time of this writing, these conferences were numerous in major U.S. and Western European cities. For example, a manager at a small client firm just embarking on offshore sourcing, when told about these conferences in an interview, said, "Oh, yes, we already went to one of these."

In addition, creative approaches have emerged to address the small firm's need to conduct due diligence. For example, we learned in our interviews of quality-certification schemes that will produce a database of accredited small offshore vendors that can be provided to clients for a fee.

Simplifying Contracting

Crafting an offshore contract is becoming less expensive partly because a greater population of lawyers now specializes in the offshore niche. These lawyers now advertise their specialized expertise of offshore outsourcing and meet their prospective clients at various specialized workshops and conferences. As offshore vendors mature, they are also standardizing their contracts. This reduces the transaction costs of contracts for small firms. An offshore vendor we interviewed has created a standardized, phase-based contract and a standardized contracting process.

Separately, the increased prevalence of onshore presence, which we noted above, implies that many of the vendor firms present a legal entity in their client's home country, thus removing contractual uncertainties for dispute resolution and the complexity of foreign legal norms. Local contracts reduce the risk of vendor opportunism since poor performance may be penalized and enforced in the client's home country.

Providing Control Channels

Small client firms need a "control environment" for offshore sourcing similar to those typically employed by large firms. This includes agreeing on a methodology, mandating frequent reporting, regular product increments (e.g., interim deliverables and pilots), and payments at milestones. This process should be made visible and measurable to the small client. Most small firms find it too expensive to design and implement such control mechanisms themselves.

Vendors in our sample are providing these control channels and reducing transaction costs for their small clients. We interviewed one U.S.-based vendor with offshore IT work in India that is phasing in a Web-based project-management system or "dashboard" that will give its small clients a more detailed and accurate view of the process. This firm is following the lead of larger offshore vendors that began to provide such online mechanisms to their large clients several years ago.

The vendor-provided control channel reduces transaction costs in other ways: it allows the small firm to assess uncertainty, offers the potential to reduce opportunism, and reduces contract costs since fewer safeguards need to be in place.

Expertise Intermediaries

In recent years we have observed growth in a variety of third parties that provide expertise and services to firms seeking offshore work. Such intermediaries have become expert at educating and preparing the small clients for outsourcing. We illustrate with two examples of intermediaries: I1 and I2. I1 is an American consultancy that helps small companies outsource offshore by selecting partners and guiding them through contracting. One of the methods the firm implements before the client outsources is referred to as "clean house." This is a process by which the consultancy brings the client's IT function to such a stage that the firm can construct robust measures for contracting and control. I2 is an Indian consultancy that specializes in setting up small development subsidiaries for small U.K. companies in India. The service includes renting buildings, dealing with local "officialdom," handling the copious bureaucracy, interviewing, employing staff, and, if required, facilitating the ongoing incubation of the firm. This company has already had several successful implementations.

Standardization of Services

Standardizing the software sourcing service lowers transaction costs in all three of the stages: contact, contract, and control. These lower costs can raise profitability for the vendor to be passed on to the client. The standardization of services reduces asset specificity, meaning that a transaction is less expensive if the asset is less specific to one of the transaction parties.

We observed that offshore vendors are reducing asset specificity by standardizing the software development methodology. This results in reduced transaction costs for the vendor. We interviewed one offshore vendor that developed its own methodology derived from the well-accepted rational methodology augmented with distributed development techniques. The firm's process to support the small firm begins with a standard four-page template to collect data from the client. This template is then immediately e-mailed to the offshore staff for comments.

Many of the firms in our study reported that they had been (or are planning on) improving their life-cycle methodologies. These were especially noticeable in the small firms that maintained their own subsidiaries offshore. While the initial stage was characterized by ad hoc development, typically within a year the firms were instituting "CMM-like" process improvements.

There are some indications that vendors are attempting to reduce their production costs. As the crop of vendors that serve the small-client market mature, they have implemented factory-like processes and moved away from the ad hoc production processes that characterized their operations in their early years. For example, the previously mentioned offshore vendor, which has many projects that involve Web sites, is increasing code reuse in FLASH.

The Special Case of Small Technology Firms

Our case studies and secondary sources suggest that small technology[7] firms behave much differently than small nontechnology firms. Specifically, our data suggest that they are far more likely to source offshore than nontechnology small firms. We illustrate with four examples from our interviews with small vendors that provide offshore software outsourcing. From the first firm, we learned that 60% of the firm's clients are technology firms. At the second firm, the CEO expressed his frustration at the difference between selling

to small technology firms and other small firms: "We don't have to educate IT firms about offshore — they already know about it."

A third firm is a small Swiss firm that does almost all its telephony software work in Russia. The fourth firm is an American firm, which upon start-up with only three staff, contracted with an Indian vendor to develop its software product.

In small business literature, Nooteboom (1993) and Nooteboom et al. (1992) note that small business staff are relatively less educated than in large businesses. However, they note that the exception in education is technology firms; in these cases, the level of education is higher than in the general population of smaller companies. Thus, the capacity for learning is high and may, indeed, be higher than in some large firms. This learning means that the firm can detect and absorb new information, making it more likely to be aware of offshore sourcing.

In the internationalization literature, we see that small technology firms have a global perspective relative to nontechnology firms (Jones, 1999). Jones summarizes the reasons for this: the orientation and perspective of the entrepreneurs, the short product life cycles (time-to-market pressures), and the drive for innovation. Since the 1990s, some of the literature referred to this class of firms as "born global" (Rennie, 1993). However, much of the literature is about small technology firms selling to international markets rather than sourcing from international markets.

It seems, based on our data, that quite a number of small technology firms "know about" offshore sourcing because of a key manager who is of Indian or other ethnic origin. Repeatedly, we have seen this to be a critical factor in the process of awareness and information. Importantly, this individual becomes one of the "liaisons of knowledge" that we noted earlier and thus mitigates the small firm's relatively higher offshore transaction costs.

In our fieldwork in India, we came across an Indian vendor that specializes in outsourcing for small technology firms. We asked the CEO (chief executive officer) why such small firms seek offshore outsourcing. He noted three reasons. First, small technology firms are very sensitive to the competitive pressures of time-to-market, and therefore hiring offshore resources reduces the time-to-market. Second, because they deal with inherently riskier business, small technology firms take bigger risks. Third, small technology firms are often encouraged, and sometimes even mandated, by their venture capital investors to develop offshore and are even given the name of the firm that they should work with. While we noted earlier that the large Indian firms turn down smaller clients, the exception is for technology clients. Working on leading-edge technologies with entrepreneurial clients, the large Indian firms can keep up with the latest innovations.

CONCLUSION

In this article we delineated the offshore transaction cost categories that are relatively higher for small firms compared to large firms. We divided these into categories, as suggested in Nooteboom et al. (1992), into contact, contract, and control. We were then able to assemble the practices and approaches used in the small company cases to mitigate the transaction costs. We summarize all our findings and observations in Table 2.

We make several observations based on our summary analysis of Table 2. First, given that the landscape of offshore outsourcing is relatively new and that the

Table 2. Summary of transaction cost mitigation findings for small firms engaging in offshore outsourcing

Source of mitigation	Mitigation approach	Brief description of mitigation approach	Impact on transaction costs
Client side	Liaisons of knowledge flows	Key individuals pivot the relationship between the client firm and offshore vendor.	Lowers transaction costs, primarily via control-cost reduction
	Gaining experience	Small firms use their strengths: motivated people, perseverance, and flexibility.	Expensive trial and error until economies of experience are gained
	Overcoming opportunism	Small firms use their relative strengths: motivated people, perseverance, and flexibility.	Expensive trial and error until opportunism is overcome
Vendor side	Onshore presence	Vendor has presence of staff close to client rather than offshore.	Reduces contact costs, contracting costs, and control costs, leading to an overall reduction in transaction costs for the client, but raises production and vendor transaction costs for the vendor that are passed onto client
	Reducing contact costs	Client has greater access to vendor firms primarily via Internet-enabled mechanisms.	Transaction costs are reduced.
	Simplifying contracting	Legal intermediaries specializing in offshore services have emerged.	Transaction costs are reduced.
	Providing control channels	Vendors are providing control channels for their clients' benefit.	Transaction costs are reduced for the client. Transaction costs increase somewhat for the vendor, which are passed onto the client.
	Expert intermediaries	Third-party consultants specialize in assisting firms in the offshore context.	Transaction costs are reduced
	Standardization of services	Standard development methodology. Introduction of reuse in software production	Lowers transaction costs for contract and control. Production costs are lowered.

involvement of small (client) firms is even newer, many of the transaction costs mitigation approaches are emerging and not fully diffused. Our data do not suggest that all small firms or their vendor-suppliers are using all the mitigation approaches listed in Table 2.

Second, two of the mitigation approaches that we found in small firms (on the client side in Table 2) are actually costly in the short term for the small firm. Gaining experience and overcoming opportunism are approaches that involve considerable resources for the small firm. It is questionable whether these small firms would have invested so much money, effort, and calendar time in these approaches if they could correctly anticipate them ahead of time.

Third, we restate a key predictive question about small firms sourcing offshore: Can small firms mitigate offshore costs at least as well as large firms? Based on our study, we suggest that small firms are not using their resources in unique ways relative to large firms in order to mitigate the offshore costs. The nine cost mitigation actions that we point to are not markedly different from the practices in large firms. It seems, at this stage, that the trans-

action cost mitigation approaches for small firms are simply lagging behind those for larger firms. We did find some weak evidence that some small firms find that their behavioral advantages can play a positive role in these mitigation approaches, namely, their flexibility, perseverance, and motivation. However, we did not find that these advantages played a key role in any of these transaction cost mitigation approaches.

Fourth, our most encouraging finding was the potential for the marketplace to reduce transaction costs rather than any behaviors or qualities of the small client firm. Small firms are benefiting from the marketplace, which is now offering lower offshore transaction costs. Both the vendors and an assortment of intermediaries are filling gaps and thus lowering the relative offshore costs for the small firms. Thus, our findings on mitigation approaches are consistent with recent theory of complementarity in IT vendors (Levina & Ross, 2003). Complementarity theory suggests that (vendor) firms improve productivity by engaging in complementary activities. These vendors' value proposition is enhanced with the complementarity of their three core competencies: methodology development and dissemination, client relationship management, and IT personnel career development. In our analysis, we noted evidence of increased competencies and the maturity of offshore vendors in the first two of these three activities, although we did not collect data relevant to the third.

In summary, we cautiously suggest that the most promising area may well be vendors' standardization of services and production. It is this trajectory that is the most fertile area for research (and practice) and will likely yield the most insight about how the global marketplace is narrowing the gap for offshore sourcing by small firms.

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ENDNOTES

1 The term "sourcing" encompasses outsourcing and what is sometimes called insourcing. Some small firms do not perform offshore outsourcing, but rather offshore (in)sourcing.

2 Small- and medium-sized enterprises are often labeled SMEs in much of the European literature and small- and medium-sized businesses (SMBs) in current American literature.

3 More specifically, the act states that a firm is small if it satisfies at least two of the following criteria: a turnover of not more than £2.8 million, a balance-sheet total of not more than £1.4 million, and having no more than 50 employees.

4 We also note that Sobol and Apte (1995) found that firms with larger MIS budgets (a proxy for size) were more likely to outsource both domestically and offshore.

5 Third parties, intermediaries, or consultancies provide expertise and services to firms seeking offshore work.

6 We note several of these online marketplaces facilitating offshore software

work: Elance (http://www.elance.com/), Freelancers (http://www.freelancers.com/), Guru, (http://www.guru.com/), and Rentacoder, (http://www.rentacoder.com/RentACoder/).

[7] By technology firms we mean firms that develop either software products or are IT service firms (that may subcontract some of their work offshore).

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