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Global offshoring of engineering project teams: trust asymmetries across cultural borders

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Offshoring represents a new way to organize engineering project work, enabling firms to leverage global cost differences and growing talent pools, particularly in emerging economies. How can such firms build trust across onshore and offshore sites when the project team members differ in cultural value systems and practices? How can resulting asymmetries in trust be managed? The literatures on virtual teams, trust, and culture highlight important differences when teams are largely operating in technology-mediated spaces *vs.* when they come together in face-to-face spaces. Our findings from ethnographic studies on global engineering projects suggest the need for high levels of trust, but project teams have few capabilities to meet this need. The conditions of project teams engender asymmetrical trust in cross cultural contexts. There is a paucity of work on global engineering project teams, asymmetrical trust, and trust repair in large complex global projects. The research opportunities remain ample.

Keywords: Engineering design, offshoring, project team, trust, culture, trust asymmetry, ethnography, communication.

Introduction

Engineering services have joined the global offshoring wave (McGraw, 2003; Bunyaratavej *et al.*, 2010; Malone *et al.*, 2011). The generally accepted understanding of offshoring is that it refers to 'the transnational relocation or dispersion of service-related activities that had previously been performed in the home country' (Doh *et al.*, 2009, p. 926). The relocation from an onshore to an offshore site can involve either a subsidiary of the firm (e.g. a captive centre) or an independent services provider. Although the primary driver of engineering and science offshoring in the early years was cost minimization, now the key driver is the access to qualified personnel (Manning *et al.*, 2008).

With global offshoring, project team members are geographically distributed, rely on technology-mediated communication, and have minimal or infrequent face-to-face interaction (Gibson and Gibbs, 2006). Engineering project teams comprise many discipline-based experts who work on highly interdependent tasks; they have to negotiate not only the specializations but also the locally embedded design preferences, experiences, tools, and routines, often despite different language backgrounds and proficiencies.

The geographic dispersal of highly complex and interdependent work exacerbates project vulnerabilities and increases the need for trust (Jarvenpaa and Leidner, 1999). Trust renders willingness to be vulnerable to another party and is a critical factor in the coordination of offshore relationships (Rai *et al.*, 2009). Trust entails a certain degree of security about or safety from psychological, economic, professional, and social uncertainties and vulnerabilities resulting from others' actions or failures to act (Mayer *et al.*, 1995; Zolin *et al.*, 2004).

Rarely has trust research examined cultural aspects of trust and trust repair in large, complex global projects that span onshore and offshore sites. We examine the research question *how onshore and offshore teams build trust*. Based on ethnographic research, we found that onshore and offshore members of a global engineering project team were challenged to build trust, even after the project team had worked together for years. The

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cross-cultural context fuelled asymmetries in trust, and its repair remained elusive. In the next section, we review selected literature on virtual teams, trust, and culture and provide some methodological notes. We then report some key findings related to global engineering project teams and trust. We conclude with directions for future research.

Review of literature on global virtual teams, trust, and culture

Much of what is already known about good team management applies to global engineering project teams (Malhotra *et al.*, 2007). However, what we know about trust-building in conventional face-to-face teams does not necessarily apply to globally dispersed teams (Jarvenpaa and Leidner, 1999; Maznevski and Chudoba, 2000; Cramton, 2001). Trust is commonly defined as the 'willingness of a party to be vulnerable to the actions of another party, based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party' (Mayer *et al.*, 1995, p. 712). Trust allows members to take part in activities that they cannot control or monitor, where they might be disappointed and put at risk by the actions of others in the team (Deutsch, 1958; Lewis and Weigert, 1985; Gambetta, 1988; Ring, 1996). Knez and Camerer (1994) refer to trust as a positive 'expectational asset'.

In global virtual teams, trust takes much less of an interpersonal nature than in face-to-face teams (e.g. Jarvenpaa and Leidner, 1999). In face-to-face teams, trust is often based on familiarity or similarity with the other members (Mayer *et al.*, 1995). Such trust is character based (Zucker, 1986): It develops as the team members interact with and accumulate information about the trustworthy characteristics of the other team members (i.e. their ability, integrity, and goodwill) (Lewicki *et al.*, 2006; Schoorman *et al.*, 2007). Trust takes on both cognitive and emotional aspects. As members begin to identify with each other, the emotional aspects of trust kick in, which can generate heightened levels of trust (Weber *et al.*, 2005).

In virtual teams, the reduced social presence and reduced spontaneity in communication makes learning about the character of the other members and identifying with others more difficult (Polzer *et al.*, 2006). In virtual teams, trust is less interpersonal and more based on the task process (Jarvenpaa and Leidner, 1999; Brown *et al.*, 2004). Trust is built from what is explicit such as the team goal and progress towards the team goal. Often trust takes the form of swift trust (Jarvenpaa and Leidner, 1999; Robert *et al.*, 2009). Communication is critical in trust-building because when effective it renders actions towards task goals more predictable and reliable. Frequent and open communication that elaborates on the issues considers the viewpoints of others and provides adequate explanation and feedback builds trust (Jarvenpaa and Leidner, 1999). Task process interventions (e.g. clearly defined roles, adherence to schedules and deadlines, and monitoring and follow-up on contributions) build trust (Zolin *et al.*, 2004). Meanwhile, a single missed deadline or other unmet expectations can quickly cause trust to plummet. The lack of interpersonal trust (including emotional bonding) renders trust fragile in global virtual teams (Jarvenpaa and Leidner, 1999).

Researchers have found that trust in global virtual teams is negatively affected by the presence of co-located *subgroups*, two or more members in one location (Polzer *et al.*, 2006). In offshoring relationships, these collocated subgroups take the form of onshore and offshore teams (Leonardi and Bailey, 2008; Levina and Vaast, 2008). Within the subgroups or co-located teams, members have high levels of familiarity and similarity in terms of ethnicity, culture, and age, which makes building emotional trust possible among those considered part of the 'ingroup'. In contrast, the familiarity and similarity between members of the onsite and offshore teams is relatively low (Hinds and Bailey, 2003). Members of subgroups that cross the local and offshore divide are perceived as 'outgroup', and this sense of a disconnect impedes identity processes and emotional trust (Brewer, 1996; Polzer *et al.*, 2006).

Repair of trust violations is more difficult in virtual teams than in face-to-face contexts. Trust violations involve disrespectful behaviour, unmet expectations, unwillingness to acknowledge others' contributions, ineffective leadership among others (Gillespie and Dietz, 2009). Trust repair refers to those activities that seek to restore damaged expectations so that both parties are willing to be vulnerable in the future (Kramer and Lewicki, 2010). Trust repair involves explanations, accounts, apologies, penance, forgiveness, reinstatement, and structural solutions (Dirks *et al.*, 2009). Note that trust repair is fundamentally about emotions and emotionally relating to others (Williams, 2007). Emotion management can be hard to accomplish in virtual teams without social presence and strong interpersonal relationships. Kelly and Noonan (2008) found that trust repair in an offshoring relationship was resolved through very personal emotional accommodation of one manager to another.

In addition to virtuality, offshoring means coordination across cultures. Cultural differences in such contexts also complicate trust-building. Both the level and nature of initial trust among members and across groups vary by culture (Zaheer and Zaheer, 2006).

Culture affects whether trust is formed largely on the basis of institutional structures or of interpersonal relationships. In the latter view, people believe that trust takes a particularistic character that is always generated from unique circumstances and personal relationships. Discussions in the anthropological literature that address trust encounters typically focus on aspects of a single group's oral or documented exchange contracts or reciprocity practices. In business and political economics literature, some countries have been characterized as high-trust countries because the countries have institutional and societal safeguards in place to penalize those who violate trust (Zaheer and Zaheer, 2006). These high-trust countries (e.g. the USA) are associated with values that lead to little societal uncertainty about trust or the efficacy of the safeguards. The people who come from these countries more easily grant trust to others who also come from high-trust countries. However, if the others live and work in countries where institutional safeguards are not in place (so-called low-trust countries), trust may be withheld (Zaheer and Zaheer, 2006). People from high-trust countries might not be accustomed to making or motivated to make large relational investments to build interpersonal trust in business relationships. However, in countries like India, where the institutional and sociocultural support for trust is based partly on structural relations that are inherited (e.g. caste or family), building trust relies more heavily on relational investments, relational norms, and personal monitoring and control systems. Such cross-cultural differences can lead to trust asymmetry as parties vary in their willingness to put forth effort to build trusting relationships.

Trust asymmetry occurs when Party A trusts Party B, but Party B does not trust Party A or finds trust either immaterial or not important enough to invest in (Weber *et al.*, 2005; Zaheer and Zaheer, 2006; Graebner, 2009). When trust asymmetry is present, coordination difficulties arise. The outcomes can vary; one group might accuse the other of opportunism, sabotage, or a lack of communication, or another group might fear being deceived or being easily replaced (Harris *et al.*, 2004; Zaheer and Zaheer, 2006; Renzl *et al.*, 2008).

Another important aspect of trust across cultures, but one rarely studied in global virtual teams, is language. A lack of shared language skills or common procedural aspects of successful communication can affect trust and perceptions of ingroup and outgroup members. Evidence suggests that speakers are more favourably judged if they accommodate to the language characteristics of the listeners (Genesee, 1984; Koslow *et al.*, 1994), or if they conform to situational norms for communication; however, extensive accommodation can also put members of other cultures at risk with those in their own group (e.g. they might be deemed inauthentic). When US English speakers are asked to compare speakers of a standard English dialect and those with 'foreign' accents, they tend to judge speakers with 'foreign' accents less favourably on both status and solidarity (Sebastian and Ryan, 1985). The solidarity dimension deals with trustworthy, friendly, kind, and benevolent aspects, among others. Researchers of language in global virtual teams have found that US team members are challenged by and fearful of language barriers (Beyene *et al.*, 2009). The US members lack coping strategies to interact with non-native English speakers who have different language backgrounds and levels of language proficiency. The many subtle aspects of intonation, prosody, and acknowledgement tokens that speakers use to indicate joint attention, appreciation, and agreement are difficult to calibrate or notice across language communities.

Trust asymmetry and communication have far-reaching implications for understanding perplexing behaviours in global engineering project teams. Communication, which is critical in trust-building, involves far more than transferring knowledge or content. No prior study, as far as we know, has examined trust asymmetries and communication in global virtual teams or in offshoring contexts.

Research context and approach

Over a three-year period, we collected longitudinal data from four different global engineering teams—each involving different partners in onshore and offshore partnerships. All the teams were part of much larger engineering projects involving the design of large processing structures. We selected the projects because they involved complex and highly interdependent work and also were representative of the type of projects carried out in these engineering organizations. During our research, the teams were designing components that included, for example, piping, pumps, foundations, and meters; they also required coordination of multiple engineering disciplines (e.g. piping, structural, instrumentation, and electrical). The onshore sites were in the USA and Canada, and the offshore sites were in India, Romania, and Brazil. The coordination demands were highest in India and Romania, where expat engineers either were not used on the project team or were used only for brief periods. We focus on the two projects between the USA and India and Romania, in which no expat engineers were onsite; these projects more fully reflect companies' aims to reduce personnel costs and rely on technology-mediated communication. In the case of these two projects, detailed design representing 30–60% of the

projects was completed while engineers worked geographically apart. Although face time between the onshore and offshore engineers happened in the beginning of the project in the context of kickoff meetings, afterwards only occasional and brief travel occurred between the sites.

Both of these projects represented a midsized, detailed engineering design project. Both project teams involved 35 to 55 full-time people, with about 15 core members each across 2 transnational sites. Both had formal coordinating managers. The offshore firms ranged in size from 150 to 200 people. The division of work between onshore and offshore was roughly the same, with the offshore site accounting for 50–60% of the detailed design. The site in Romania had completed three other projects with the US site prior to this project. The Romania site operated as an independent company from its onshore partners. The India site had also completed previous projects with the US onshore site, when it had been an independent firm, but during the project we studied, the US onshore site acquired the India offshore site.

All the project teams used a shared engineering design system, a shared database of drawings, a formal change order database, and action lists. One of the project teams had developed an extensive web-based process control system for managing action lists and tracking change orders.

We gained access to the project teams as part of a research project to understand communication practices in cross-cultural, virtual team environments. We made multiple visits to the US sites and conducted a one-month participant–observation study at the Romania site and a two-month participant–observation study at the Indian site. For both projects, we conducted broad-based interviews with engineers (40 engineers and staff in the US/Romania project and 33 in the US/India project). We participated in and audiotaped conference call meetings between the onshore and offshore sites, transcribing both the interviews and selected conference calls at the different completion phases of the projects. In our data analysis of interviews and calls, as well as in the extensive observations we made and notated during meetings, we looked for situations in which engineers specifically described problems and challenges related to collaborating cross-culturally in non-co-located teams (e.g. behavioural inconsistencies, attribution of blame, unexpected rework, and evaluations of others). In analysing conference calls, we used approaches from the analysis of interaction and conversation analysis (Sacks *et al.*, 1974; Goodwin, 1981), which take responses to utterances as evidence of how that utterance has been understood. Although many misunderstanding and conflicts in assumptions can be identified in the analysis of conversation, preferences for particular modes of interaction do not always surface; instead, they often are noticed by participants and can then be discussed in interviews (see, e.g. Wynn and Novick, 1995). Our goal was to gain understanding about the participants' point of view. In the rest of the paper, we highlight some of our findings related to trust. A more detailed description of our findings is in Jarvenpaa and Keating (2011) and Keating and Jarvenpaa (2011).

Findings on trust and trust-building in global offshoring of engineering services

Our research has produced findings on trust both within the project team and at the higher organizational level.

Trust findings within the global engineering project teams

The overarching findings from our project team research include the following: (1) global construction engineering project teams have high trust needs; (2) the teams' onshore and offshore co-located subgroups split into an 'ingroup' and an 'outgroup'; (3) trust asymmetry emerges and persists between the 'ingroup' and 'ougroup'; (4) technologically mediated spaces formalize and centralize communication; and (5) trust repair is rare but aided by humour and self-reflection.

Global construction engineering project teams have high trust needs

Even after years of working together on a joint construction engineering design project, globally dispersed project team members expressed an urgent need to 'communicate and communicate more' and request 'more travel' and 'more face-to-face meetings'. These indicators suggest that the trust-building mechanisms were not sufficient and that trust needs were not being met in a project team, despite daily virtual interactions among dispersed members over long periods of time. These cries were largely unrelated to project teams' performance levels.

High trust needs arose from two primary sources. First, the project team, whether onshore or offshore, did not get to decide whether it would work 'in' another culture or location (when technology made it possible). Within the project team, the members had little volition or moral choice about their partners on the project. The decision to offshore or not to offshore a project is performed at a much higher level than the project team: 'the decision [to offshore] was made by [upper] management'. Second, offshoring engineering

design work involved very high interdependencies, combined with few opportunities to get to know others at the interpersonal level. The work involved highly customized processes and complex interfaces among different engineers designing different components. Much of the knowledge of design and engineering practices had traditionally been gained through practical experience, aggravating the knowledge transfer issues. In addition, complex interdependencies arose from organizational, client, and competitive environments. Within the organization, engineers faced the pressure to reap cost-competitiveness by limiting the rechecking of work, introducing better schedule control, and rearranging project work and team assignments. Frequently revised and renegotiated client needs and turbulence in the broader global business environment both resulted in high levels of unpredictability. The interdependencies and unpredictability, combined with cultural and geographic distance, rendered trust needs very high.

Although the project teams had less control over some unpredictable factors, they did have control over the project execution plan, which divided the responsibilities between the onshore and offshore co-located teams. We witnessed constant changes to these plans, which further intensified the degree and complexity of interdependencies, as well as the unpredictability about who was doing what or what each group's scope of work was. In the US/Romanian project, work was moved back to the USA at one point in the process, apparently in an effort to reduce trust needs. A discipline lead in one of the conference calls announced that he was keeping part of the design project onshore rather than having it completed offshore as planned, saying, 'we know we all want to do what's best for the project'. At other times, work was shifted offshore with little prior notice. The Romanian offshore manager's response was often, 'put it in writing', as he tried to protect his team from unwanted shocks and have a basis for recalibrating costs based on changing scope. In the US–India project, the offshore manager invariably agreed to unplanned shifts in work execution, perhaps because of a cultural avoidance practice that avoids direct refusal of a request and instead signals 'no' through very subtle means, unrecognized by the other group. Failing to communicate an explicit 'no' resulted in negative consequences, such as working overtime and neglecting important family needs. In conference calls between countries, the offshore members rarely showed their frustration and anger. However, in private, they conveyed their sense of injustice: 'We are the servants because we work while they play', referring to the onshore team's unfinished work being shifted offshore at the last minute because of a US public holiday.

Much of this unpredictability in the work flow appeared to result from the US engineers' lack of additional planning when not sharing the same physical office space or time zone. Differences in engineering training and practice exacerbated the problem, increasing the need for careful communication and coordination because the interdependency spanned huge diversities in language and work approaches. When work was unexpectedly shifted, data were invariably missing. The offshore team members felt vulnerable because they could not trust the onshore team to protect them from a potentially chaotic situation and to show compassion.

Onshore and offshore subgroups as 'ingroups' and 'outgroups'

In all the projects studied, the work systems involved two major subgroups: onshore and offshore. In all project teams, the 'ingroup' and 'outgroup' dynamics polarized communication and behaviours across the subgroups—resulting in ingroup favouritism and outgroup bias—and led to 'us *vs.* them' behaviours that damaged trust. A disputed history of events arose in both projects: 'Can you believe this email [and the way it characterizes what has happened]?' 'Can you believe this critical report [and the way it characterizes our role]?' Unacknowledged vulnerability caused the subgroups to engage in negative comparisons of the other subgroup as a means to reassert their own distinctiveness and decrease the threat to their own subgroup identity. Failing to perceive that high trust needs were not being recognized or met, the engineers tried other ways of understanding the root cause of problems. One engineer on the US–Romanian project remarked, 'When I say the American way of business, there is a general way of doing design, I am dealing with that problem upfront so as to avoid any rework due to the offshore design standards that are not quite up to the way we do business'. Another said, 'They [Romanians] don't ask, are afraid to ask questions. [The offshore location] cannot think out of the box'. Sentiments from both offshore sites included observations that 'Americans never talk, they just sit in their cars', 'Americans overengineer things', and 'Most of the Americans don't know anything about the rest of the world'. Other, more reflective statements acknowledged the polarization and why it was happening:

> They have no clue what kind of animals are we here, what is our capability, what we can do, what we can't do, and there are probably some language barriers and some foreign cultural barriers. It's not that they are bad persons. I think probably it would have happened to me as well; if somebody tells me to upload

> the job to a company in [developing country x], probably I will be as scared as they are. So from that I can understand what is happening. (US–India project)

A suspension of anxieties seemed to occur during conference calls, where participants used a lot of 'we' framing of goals and written action lists made interdependencies seem clear. The conference calls did not provide a space for questioning or complaining. When project members were anxious about an emerging outgroup status, they tended to express these anxieties to peers or bosses (and frequently to us, the researchers), rather than problematizing the whole nature of the work system or seeing the need to take action to repair trust. At times, they also developed structural solutions, such as moving work back onshore, as noted earlier.

Trust asymmetries emerge and persist

With trust asymmetry, parties view 'ingroup' and 'outgroup' dynamics, their trust choices, and their interaction from differing perspectives. Trust asymmetries complicate trust-building because different trust investments (e.g. communication, conveyance of care, feedback, perspective taking, etc.) have varying effects on the co-located subgroups. If the offshore team members feel particularly dependent on the onshore team, they are likely to 'ameliorate the anxiety associated with dependence by perceiving [the other subgroup] as trustworthy' (Weber *et al.*, 2005, p. 75). The onshore team, which feels less dependent, inaccurately perceives itself to be less affected by trust issues and finds little incentive to invest in trusting actions that would show respect and concern. This lack of motivation is partly fuelled by the false security, in this case, relying on institutions and penalties to ensure predicted outcomes. The onshore group is likely to continue to engage in protective actions that allow its members to maintain power and dominance over the other group. The offshore group expressed the sentiment that the final decisions were always made in the onshore group; thus, the offshore group was willing to concede that it could only suggest design solutions. This perspective created a fundamental asymmetry in which one subgroup felt forced to trust the other (and to continue in the relationship), while the other behaved as if only a minimum of trust was required. The onshore team might have inaccurately perceived that keeping the offshore team vulnerable was a necessary consequence to maintaining power. The asymmetry further complicated the attempts to get the teams 'on the same page' (designing optimal engineering plans) and to benefit from each team's adjustments to each other. With trust asymmetry, parties tended to have less positive conceptions of each other's actions and less positive expectations of their future actions. Thus, even if a member of the other subgroup had reliably delivered in the past, grounds for a suspicion of future reliability remained because reliable delivery was perceived to have resulted from constant personal monitoring. In addition, competitiveness surfaced in terms of dominant-minority relations; the onshore firm, for example, might believe that its knowledge was superior.

Asymmetries in trust had far-reaching implications in terms of cost control and cost-effectiveness for the project teams. Outcomes of such asymmetries also included withholding professional knowledge, a lack of interest in learning about others' cultures, misreading of feelings and emotions, violations of cultural norms that guide feedback and other forms of reciprocity, disinterest in interaction to improve understandings of the others, unclear information-seeking rules (who can ask for what information and when), and failure to refer to documentation when it existed.

Our research found little evidence that trust asymmetries decrease over time. Instead, asymmetries persisted because they were grounded in and fuelled by fears stemming from common misunderstandings about the economic effects of globalization and by a persistent view of the nation as the key organizing principle in economic well-being. Perceptions were that offshoring relationships—even within the same firm—meant engagement with parties outside the firm's home country, or outside the country in which the project member resided, to execute work that otherwise might have been completed by someone in the same home country. According to one senior US manager, 'offshoring always involves an omnipresent fear of lost jobs and transferred competencies to more cost-competitive regions'. Thus, the onshore subteam members saw the offshore team to be taking work away and becoming the future competitors of the onshore team. Across all the projects, we heard comments such as, 'it will save us a lot of headache if we do the work here', 'the scope of problems would have been far less if the work had been done here'. These sentiments promoted protectionist actions.

At the offshore site, anxieties surfaced about maintaining cost-competitiveness with other new and growing offshore locations in their own countries or in other countries (e.g. Bangladesh, Vietnam), and about the rising cost of their own labour hours. Anxieties focused on whether the offshore site would get the work hours needed to keep people employed and thus avoid the turnover that led to lower levels of engineering competiveness. Fears were expressed that an American-style engineering management would be established in offshore sites, leading, for example, to mass layoffs at times of a slowdown rather than investment in skill development. An offshore engineer on the US/India

project reflected this fear: 'As long as you are billable, you are on the payroll … and the moment you are out of the job, I mean out of the project, you are out of a job'. Another offshore engineer explained:

> So usually there is a perception on the U.S. side that this office is not working or something is probably falling through the cracks. This feeling that something is not falling in place seems to be part of living with a job sharing culture. Priorities have to be constantly discussed so that they know what we did, but they are not aware of.

In summary, the existence of trust asymmetries further polarized the parties and affected how the parties saw their interaction and how they interpreted each other's behaviour.

Technologically mediated spaces change communication from informal and distributed to formal and centralized

Few opportunities for face-to-face interaction and dependence on technology-mediated contexts for communication contributed to the difficulties in building trust in the project teams we studied. The technology-mediated spaces made the work possible without face-to-face meetings, but they reduced the informal and spontaneous social moments that are critical for building interpersonal trust—both in societies with institutionalized trust mechanisms and in those without. The technologically mediated spaces formalized and centralized communication and left little room for small talk. Project team members were discouraged from using the phone because phone calls provided no permanent record or documentation that could later be reviewed and negotiated if disputes about change orders or rework arose. An engineer on the US/Romania project explained his frustration with the policy:

> On the phone I say, 'open that file and look at that', but [my project manager] wants everything put in an email and sent to [the U.S. engineering lead]. Emails for everything, not by phone now. I spend too much time and energy writing emails, and the U.S. lead gets nervous.

At the offshore site where English language proficiency varied, many hours were spent in crafting, editing, and fine-tuning emails because they became permanent records of the work activity.

Although the coordination via shared models, databases, standardized work management systems, and joint teleconference calls was constant, the communication that drove that coordination was centralized. For example, in the Romanian offshore team, the Romanian project manager was the spokesperson for all the individual expertise in the Romanian team. The US team welcomed this approach:

> The majority of my conversation would be through him [the project manager] … it should be a minimum amount of slowdown because of language barriers so long as they continue to have the one individual who speaks reasonable English.

Seldom did we hear words from onshore team members demanding that offshore counterparts be given a voice (e.g. '[Romanian offshore engineer's name] never gets to speak'). Instead, onshore project members showed little awareness that the lack of a voice of the other members exacerbated the offshore sentiment that the onshore team had 'no clue what kind of animals we are here', and that they knew nothing of the offshore team's contribution to the work.

Although the technologically mediated communications made the conference call conversations more formal and centralized, they did not necessarily make them less chaotic. Our field notes on the US/India project demonstrate:

> Difficulties arise in managing turns taken in conversations. Long pauses occur and then several people jump in all at once to fill the silence. There is much overlapping talk competing for the floor. One engineer on the onshore site speaks frequently, even at times with a lowered voice, but does not address the offshore side directly.

When someone from the onshore site travelled to the offshore site, they were surprised to hear and discover how chaotic their side seemed in the conference calls when experienced from the offshore team's location.

We also noted how onshore project members expected a shared point of view to be generated merely by looking at something. We heard repeated calls to 'Look at the model', because team members expected the model to be self-explanatory. Documents were passed electronically, but there was little discussion and feedback on them. At times, it appeared that the significance and importance of what knowledge was supposed to be gained from what document was lost. An offshore manager on the US/Romania project acknowledged, 'this mode of working is taking its toll on the team. Our leads are overwhelmed with email'. An onshore manager noted, 'we have to communicate every mistake that we find and send it back to them'. We also noted that when the actual computer model was discussed in the conference calls, the US team became more dominating and in charge of the conversation. They offered fewer suggestions and issued more

rules or demands. When the conversation was not centred around the computer model, both sides appeared to be more collaborative in seeking solutions.

Trust repair is rare but aided by humour and self-reflection

We witnessed little trust repair in conference calls and heard little about repair in our interviews. When a trust violation involved the US side, team members on the US side rarely took the blame and expressed little need to engage in repair. Also, we rarely witnessed any explanations from the US side, or explorations of what might have happened. In one instance, the Romanian offshore group interpreted the US team's failure to share equipment data as withholding and taking advantage of the offshore group. The trust repair appeared complicated, and the US team seemed to give up trying to achieve it:

> Offshore project manager: … just have evidence of what items [are] missing. I think you have some motivation for not sending [it to] us.
>
> US project manager. (*to US colleague*) it's okay [name of US manager], let it go.
>
> (*shuts down the phone's microphone*).

Because of cultural differences, it appeared that trust repair efforts were difficult to undertake in a way that was seen as sincere by the other side.

Trust repair was also complicated by the different interaction styles. For example, to Romanians, bargaining and extended negotiating sequences were a way of demonstrating expertise and a way to exert their equity needs. Thus, debate and negotiation were valued. However, the bargaining style of interaction (e.g. over schedule and hours) eroded rather than built trust on the US side. The bargaining raised questions about the nature of the relationship (adversarial or collegial), about the quality of the work and its timeliness, and about reasons for the rejection of proposed solutions; it also led to protracted disagreements about billable hours. In addition, the bargaining success of the Romanians eroded the US engineers' feeling of reciprocity and security that care was taken to protect their vulnerability. As a result, offshore engineers had to prove their reliability at each interaction.

An undermining of trust repair also resulted from the heavy use of emails. We heard from Indian engineers how short emails from the US project team members undermined expected solidarity because the emails did not convey any evidence of 'noticing the person'. When US engineers neglected to write, 'dear X' or to sign 'regards' in emails, Indian engineers observed that 'I feel his arrogance'. Meanwhile, the US engineers operated on the assumption that, as one engineer expressed, misunderstandings could be avoided by trying to keep sentences 'short and to the point'.

We were surprised to find that the use of humour could effect a degree of trust repair. In a conference call, for example, an offshore engineer on the US/Romania project joked by continually increasing the percent of work the team had finished in response to the question from an onshore manager. The onshore manager got the joke and said, 'Hey! Quit doing that!' in a friendly way. On another occasion, self-deprecation was communicated in a comical way.

In addition to humour, trust repair seemed possible when self-reflection with others was undertaken to share and process cognitive dissonance from unexpected and unpredictable behaviour. On one occasion, the wrong documents were sent from an offshore site to an onshore site. Initially, the project manager expressed apprehension that the offshore site was trying to get away with something, but after a phone call with the offshore Romanian site the manager, he explained to us:

> Some of it is just language and culture issues. Some of it is us being busy, that we didn't explain everything in enough detail for them to understand, and if it was somebody upstairs I would have just walked up and told them what's going on; I wouldn't have to sit down and write a detailed, item-by-item email. But this is a lost in translation-type situation, and I was apprehensive of it, but it is invariably going to happen at some level just because of our lack of familiarity with their culture.

Trust repair might have occurred at the interpersonal level, in a closed meeting at which we were not privy to attend. When travel between the sites happened, we often heard that 'so much was accomplished!' For example, when a US team lead spent time at the Romanian site, we were quite baffled by the offshore project manager's raves about how much was accomplished. Perhaps what was accomplished was trust repair. Within sight of the visiting onshore engineer, the offshore engineers' diligence, intentions, and long hours could be seen.

Building organizational level trust competencies: presumptive trust across borders

The prevailing literature argues that when the teams themselves cannot fulfil their trust needs, then it is incumbent upon the organization, through various

institutional structures—including leadership—to set the conditions for trust (Kramer and Lewicki, 2010). Presumptive trust is a generalized form of social expectation that is used when members do not have enough information to form positive expectations about others' differentiated, trust-related intentions (motives) and capabilities (competencies). Presumptive trust can be based on superordinate organizational identity, well understood roles, and shared rules, all of which have 'trust-warranting' properties (Kramer and Lewicki, 2010). However, we found that cross-cultural organizational contexts present major challenges to these sources of presumptive trust.

Superordinate organizational identity

The superordinate organizational identity can facilitate trust because it engenders the sense that project team members are all alike and form a shared social group (Kramer and Lewicki, 2010). This sense is based on a positive stereotype hypothesis, or an expectation of generalized reciprocity hypothesis. In the offshoring context, the onshore and offshore groups would unite behind a superordinate organizational identity. We certainly heard during conference calls, 'we are on the same team', and 'let's get along', when conflicts and disagreements were disrupting work. One Indian offshore site had many corporate images throughout the office space, but we still found a great deal of 'us *vs.* them' mentality.

The cross-cultural setting of the global engineering workplace complicates the use of superordinate organizational identity. Building an organization-based predictive model of the others' behaviour that is sensitive to the differences in practices, time zones, and daily life is difficult; as conveyed by one informant on the US/India project, 'Their timings are different from ours'. These differences themselves are a source of trust loss.

A shared social group assumes shared goals (including attitudes towards work) and shared decision-making (on an equal or fair basis). However, in our research, the decision rights remained largely in onshore teams, whereas the offshore teams viewed themselves as implementing the continually changing decisions of the onshore group. Shared goals depended more than was acknowledged on local experience and on tacit knowledge. Also, they were oversimplified. For example, the Romania offshore team was asked to deliver a design based on a previous US job—a copy job. However, the client requirements kept changing, which made it very difficult to understand what a 'copy' of a previous job meant. When the Romanian group brought up this challenge, the US interpretation was that the Romanians were overly fastidious. Also, the onshore team did the non-copy job parts. The offshore group had to accommodate when the two subgroups had different goals.

Hierarchy also complicated superordinate organizational identity and the sense that members are all alike. Despite much talk about consensus and parity (common goals and equal status), daily action clearly differentiated who could make what demands, whose timings and temporal space dominated, who was a student and a teacher, who could give direction and who followed, who needed to accommodate to whose style, who had to follow rules and who did not, and who apologized and who took responsibility. A US manager at the beginning of the US/Romania project remarked at one point, 'We are going to force communication on them'. Using a previous experience he had had with another offshore team, he attributed current problems to the lack of communication. The US team members saw themselves as teaching the offshore team the right way to design. However, they showed little openness to learning from the offshore team, despite promises to the contrary at the start of the project.

The presumptive trust based on superordinate identity also assumes that individual personal values are in congruence with what is signalled by a collective identity. Neither onshore nor offshore engineers were necessarily prepared or willing to negotiate or compromise their values. An offshore engineer on the US/India project reflected on what India team members perceived as the US engineering culture's lack of caring about people: 'So definitely we cannot bring that culture here'.

Roles

Another way to develop presumptive trust is through clearly defined roles. Such roles can serve as proxies for trust because they come with certain expectations, obligations, and behavioural repertoires (Kramer and Lewicki, 2010). Roles are usually organized by function and convey a certain system of expertise that can substitute for interpersonal knowledge and serve as a key mechanism for effective coordination on interdependent tasks (Bechky, 2006; Meyerson *et al.*, 1996). According to Dawes (1994, p. 24) (in Kramer and Lewicki, 2010), 'we trust engineers because we trust engineering and believe that engineers are trained to apply valid principles of engineering … . We have evidence every day that these principles are valid when we observe airplanes flying'.

Differences in cultural context pose challenges to the functioning of roles as proxies of trust. Roles vary not just by professional function but also by power function (i.e. hierarchy). Hierarchical role practices are culturally embedded in the workplace and in work practices and

are difficult to translate or integrate across groups. In one of the face-to-face kickoff meetings involving project members from both onshore and offshore teams, the Romanian project manager was the only one sitting at the conference table with the US engineering team; the rest of the Romanian team was sitting away from the table, showing the proper deference to their boss. In the US setting, this practice resulted in less visibility for the majority of the offshore team. Hierarchy operated differently in onshore and offshore teams. One team lead in the US/Romanian collaboration, who was unaware of communication implications of the offshore hierarchy, observed, 'I discussed one issue with him [his counterpart offshore engineer], then an hour or two later, the [offshore] project manager comes over and discusses it with me and says "I notice that you have told the individual to do this and this and we don't do it that way"'. Vulnerability to loss of face can result from unrecognized hierarchies.

Roles are also highly influenced by selectivity and socialization practices, and such practices are embedded in local values, norms, and institutions. In our research, the onshore team consisted of engineers and designers; meanwhile, the offshore team consisted only of engineers. An onshore engineer in the US/Romanian project explained, 'Looks like they don't have designers—all engineers … they go to school, they learn the engineering side, but they don't know the functionality'.

Rules

According to Kramer and Lewicki (2010), presumptive trust can also be based on rules because people expect to behave based on rules. Rules constitute codified norms for conduct. Rule-based trust stems from a shared understanding regarding how rules both constrain and enable via self regulation. Rules provide social proof or validation to members that their individual acts of trust are sensible.

However, rules are often used in power plays, including in cross-cultural contexts. 'The boss is always right' was a phrase used to refer to the onshore group. Rules are best considered as generalized strategies that require knowledge of convention to apply properly and that are hard to communicate cross-culturally. An offshore engineer in Romania sighed with frustration:

> I am okay if I figure out the company bible … . They say do it the '[onshore company] way'—for example, with the piping—but the teams on each job are different and they observe differences in the way the '[onshore company] way' is implemented. Because of the team and the leaders, they have another vision.

However, we also witnessed a few instances of discussions about how to understand unpredictable or inconsistent applications of rules. In one conference call, the members of the onshore team justified why they were resorting to a local contingent practice. The onshore engineers explained the ad hoc method they were devising and the effect this method would have on the rest of the project.

Leadership

Leadership plays a pivotal role in presumptive trust by reinforcing the presumptive bases of trust (Kramer and Lewicki, 2010). Leaders can heighten the sense that identity, roles, and rules are reasonable grounds for maintaining trust. The leader becomes the conduit for trust. For example, a leader can signal that the team members are 'handpicked', conveying their undisputable competence and loyalty to the leader. Prior virtual team studies have demonstrated that leadership is pivotal in building trust in geographically dispersed teams (e.g. Kayworth and Leidner, 2002; Joshi *et al.*, 2009). According to Joshi *et al.* (2009, p. 249), 'dispersed contexts represent "situational enhancers" that strengthen the role of inspirational leadership'. Because of the lack of a shared context and the lack of informal and spontaneous communication, building commitment to the team's goals, building members' confidence in the team, and energizing the team fall to the leaders of the team (Joshi *et al.*, 2009).

However, this view of leadership assumes a unitary force that is situated in one place. In global offshoring, leadership is situated in multiple places. Leaders have counterparts, but these counterparts are not necessarily in the same structural position and may not share equal power, status, and autonomy, as cultural context shapes the leader–follower relationship. In our research, we encountered a lack of visibility of leader behaviour. Culture also shapes what style of leadership is effective. The sites varied in terms of the expected level of aggressiveness of leaders. For example, India valued non-aggression, whereas the US engineers valued leaders who were 'go-getters'.

Rarely did we find engineers who had no formal leader role exerting leadership behaviours. This finding is contrary to some of the findings from studying offshoring of IT services (Levina and Vaast, 2008); in IT services, informal leaders were found to play an important role. We did find significant variations in the leadership behaviours exhibited. Some leaders behaved as dominating bosses, others as mediators, and some as coaches. The dominating bosses constantly 'reined in' individual autonomy, dictating solutions that resulted in feelings of disrespect and inequality. The mediators focused on conflict resolution, for example,

by proposing design solutions that accommodated the different parties. The coaches modelled culturally sensitive behaviours that let the design solutions emerge from the teams.

The leaders who chose a coach role seemed to be most effective. The coach promoted a shared understanding and active involvement of the project team members at the offshore site in decisions. The divisions within a co-located subgroup were not allowed to confuse the other side. If an intra-subgroup disagreement arose during the conference call, the subgroup would go offline until agreement was reached; then the conference call would resume. This coach constantly confirmed that both sides understood what had just been proposed or agreed to (e.g. 'Are you clear on that [engineer x]?' 'Do you understand what we need?' 'Do you have any questions about what we just discussed?'). The coach paced the information flow, relating individual engineers' utterances to the topic at hand. Schedules and standards were followed. The coach also helped to prevent the onshore and offshore teams from having to deal with external information that did not seem pertinent to current issues.

Future research

Offshoring of engineering project work represents a new and advanced form of services offshoring. However, empirical analyses to this point have been rare, as have fine-grained indepth studies. In the cases we have discussed, trust needs were high for a geographically dispersed engineering project team comprised of members from different cultures operating in technology-mediated spaces. However, the project teams were unable to meet the trust demands. The broader organization, through various institutional structures, was also unable to meet the demands. This paper is a call to better address trust challenges in global offshoring engineering project teams.

We need a more accurate understanding of the mechanisms that can be used effectively to build trust in cross-cultural collaborations. Our ethnographic work has shown some of the challenges of building trust in such settings; nevertheless, we have studied only a limited number of project teams and reported on even fewer, which precludes the generalizability of the findings. Multiple-case studies that cover more countries should be conducted; increased diversity would aid theory-building.

Work to be done includes exploration of how to understand, interpret, and translate trust across cultures so that unwitting aggravation of dependence concerns, which lead to inefficient project teams, can be avoided. Trust has a strong emotional component, and emotions are mediated through cultural values. Achieving trust across distantly located teams requires empathy and flexibility in taking another's perspective. Work also is needed on the role of communicative practices. For example, when does the US style of directness in communication promote trust (i.e. providing clarity) and when does it undermine trust (i.e. lacking compassion and respect)? Research needs to be done to develop a better understanding of how trust appraisals can be made more reliable when trust asymmetries exist.

Research on trust repair is in its infancy, both for virtual teams and for offshoring. Why is trust repair so rare in our data? Are discussions of emotions such a taboo in engineering teams and in cross-cultural situations? Does the concept of trust repair assume similarity in interaction practices, which are known to vary across cultures? Although apologies are a common way to begin trust repair, they are also routinely used as excuses and can vary in their relevance and efficacy, according to both hierarchical roles and definitions as to what constitutes a significant repair action. What is the role of rituals in trust repair? Does a certain threshold of trust have to exist before people are willing to engage in efforts to build or repair trust in geographically dispersed settings? What new forms of trust repair are emerging in cross-cultural contexts? How can monitoring mechanisms to which all parties agree facilitate trust repair? Or do monitoring mechanisms undermine trust repair because they assume that trust must be continually demonstrated? What are the gendered aspects of trust-building and trust repair in cross-cultural relationships? Does the age of engineers play a role in cross-cultural trust relationships and in trust repair, and is trust less fragile with younger engineers? How should projects be structured and governed so that trust develops and grows?

In this paper, we have emphasized process and institutional bases of trust over interpersonal forms of trust. Interpersonal trust, however, is less fragile and more potent in dispersed contexts than other forms of trust (Bell and Zaheer, 2007). A better understanding is needed of how, in offshoring contexts, engineers can develop interpersonal trust without face-to-face interactions. Can personal experience narratives be used in this effort? Would exchange of such narratives between team members build understandings about stance, attitudes, and values, leading to less fragile trust in globally dispersed engineering teams?

Further research is also needed in understanding the role of leadership in trust-building and repair. Leadership appears to be an effective way to cultivate presumptive trust in offshoring contexts. We have described how a coach model of leadership helped to promote trust by focusing not only on design integrity, but also on

process, personalization, and explicit confirmation. What other forms of leadership cultivate trust? What is the role of leadership in trust repair?

Finally, future research is needed to develop a better understanding of the relationships between hierarchical structures and trust. When does hierarchy facilitate trust-building? Trust assumes volition, but in some cultures engineers might shun autonomy in work choice in exchange for increased predictability. In such situations, do engineers depend on hierarchy to facilitate trust-building? If hierarchy weakens independence and limits individual capabilities to demand respect, does hierarchy undermine trust repair? We invite you to join us to pursue these and other research opportunities.

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